

## Operating Instructions

### **USK 230 B - HV 208 II**

Automatic Grinding Machine



# Operating Instructions

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## USK 230 B - HV 208 II automatic grinding machine

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### Documents for machine operator

Operating Instructions

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# 1. Important notes

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## 1.1 Preface to the operating instructions

These operating instructions are intended to make it easier to get to know the automatic grinding machine, referred to in this document as grinding machine, and to use it properly for the intended purpose.

The operating instructions contain important information on how to operate the grinding machine safely, properly and cost-effectively. Observance of these instructions helps to avoid hazards, avoid repair expenses and downtimes, and to increase the reliability as well as service life of the grinding machine.

The operating instructions must always be accessible at the place of use of the grinding machine.

The operating instructions must be read and used by all persons entrusted with working on the grinding machine, e.g. those entrusted with:

- Transport, installation, commissioning
- Operation, including troubleshooting in the process flow, as well as
- Upkeep (maintenance, repair).

In addition to the operating instructions and the binding accident prevention regulations applicable in the country and place of use of the machine, the generally acknowledged rules of technology with regard to safe and professional work practices are to be observed.

## 1.2 Warnings and symbols in the operating instructions

Heeding the following safety alert symbols/designations used in the operating instructions is absolutely necessary:



The hazard triangle with the signal word "CAUTION" is a work safety indicator for all work for which there is a risk of serious or fatal injury.

Special care and caution must be exercised when carrying out such work.



"ATTENTION" is used to draw attention to particular points in order to avoid damage to and/or destruction of the grinding machine and its environment.



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

# 1. Important notes

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## 1.3 Warning signs and their meaning

### 1.3.1 Warning and prohibitory signs on the grinding machine

The following warning and prohibitory signs are located on/in the grinding machine:



#### **CAUTION! DANGEROUS ELECTRICAL VOLTAGE (warning notice on the rear panel)**

On being connected to the current supply (3x 400 V), the grinding machine becomes electrically live and touching its live parts directly could be life-threatening.

Current-carrying device parts may only be opened by authorized personnel.

The grinding machine must be separated from the mains supply before carrying out servicing, maintenance and repair work on it.



#### **CAUTION! RISK OF INJURY FROM ABRASIVE PARTICLES (mandatory sign on the front plate)**

Grinding, polishing and deburring gives rise to grinding particles which could enter the eyes.

Wearing protective goggles is mandatory when carrying out such work.

### 1.3.2 General mandatory signs

The following general mandatory signs must be followed:



#### **CAUTION! RISK OF INJURY FROM KNIFE**

Working with the grinding machine involves grinding knives that could cause serious cut injuries due to their sharpness.

Protective gloves must be worn when clamping and releasing knives.

Caution when transporting blades. Use the protective equipment provided by the knife manufacturer. Wear safety shoes and safety apron.

# 1. Important notes

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## 1.4 Rating plate and serial number

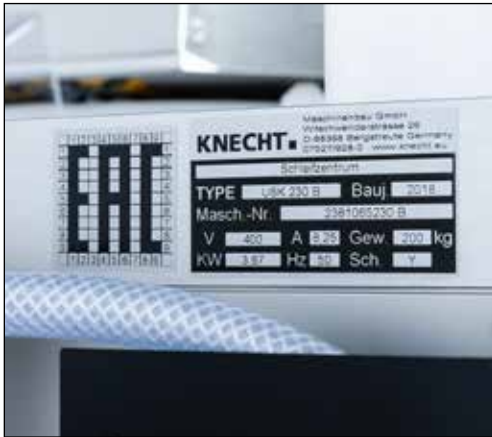


Figure 1-1 Rating plate

The rating plate is located on the rear panel of the grinding machine.



Figure 1-2 Machine serial number

The machine serial number is located on the rating plate and on the back and right on the base plate of the belt protection hood.

## 1.5 Figure and position numbers in the operating instructions

If there is a reference to a machine component in the text which is depicted in an image, the figure and item number will be given in parentheses.

Example: (7-4/1) means Figure number 7-4, item 1.

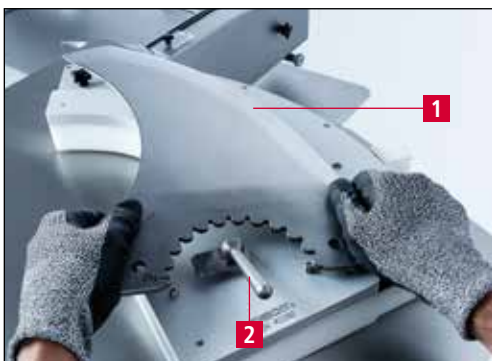


Figure 7-4 Clamping the knife

Place knife (7-4/1) on the mounting for the copy grinding plate and turn latch (7-4/2) onto knife.



# 2. Safety

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## 2.1 Basic safety instructions

### 2.1.1 Observe notes in the operating instructions

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

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

### 2.1.2 Obligation on the part of the operator

The operator is obliged to allow only those persons to work on the grinding machine, who

- are familiar with the occupational safety and accident prevention regulations and have received instruction in handling the grinding machine,
- have read and understood the operating instructions, in particular the section entitled "Safety" and the warning notes, and have provided signed confirmation of this.

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

### 2.1.3 Obligation on the part of the personnel

All personnel working on the grinding machine shall be obliged, before starting work, to

- observe basic occupational safety and accident prevention regulations,
- read the operating instructions, particularly the section entitled "Safety" and the warning notes, and provide signed confirmation of this.

### 2.1.4 Hazards involved in handling the grinding machine

The grinding machine has been built to the latest technological standards and the acknowledged rules of technical safety. In spite of this, its use poses inherent risks which could result in bodily harm or even death of the user or third persons, or impairment of the grinding machine or other property.

The grinding machine may be used only:

- for its intended purpose
- in faultless condition with regard to safety-related aspects.

Malfunctions that may impair safety are to be rectified immediately.

## 2. Safety

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### 2.1.5 Malfunctions

If safety-relevant malfunctions occur with the grinding machine, or if the processing behavior indicates that such malfunctions may have occurred, the grinding machine must be stopped immediately and until such time as the malfunction has been found and eliminated.

Allow only authorized trained personnel to eliminate the malfunctions.

## 2.2 Intended use

The grinding machine can be used universally for all standard cutter knives, as well as circular knives, hand knives, and other cutting tools.

Other than hand knives (e.g. carving knives), all the knives must be clamped to suitable grinding plates. Before starting work on a flat knife, first check that the knife fits onto the grinding plate. Only then may the knife be clamped onto the grinding plate.

Any other use is considered to be improper. The company KNECHT Maschinenbau GmbH is not liable for any damage arising from this. The user alone bears this risk.

Use as intended includes the observance of all the notes in the operating instructions.

The grinding machine is being used improperly if, for example:

- flat knives are ground without using the grinding plate.
- fixtures are not properly attached.
- knives are sharpened/polished in the opposite direction of the cutting edge on the wet-grinding belt or the finned brush.

## 2.3 Warranty and liability

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

- improper use of the grinding machine,
- improper transportation, commissioning, operation and maintenance of the grinding machine,
- operating the grinding machine with defective safety devices, or using improperly attached or malfunctioning safety and protective equipment,
- failure to observe the instructions with regard to transportation, commissioning, operation, maintenance and repair of the grinding machine,
- unauthorized structural alterations to the grinding machine,
- unauthorized modification, e.g. of the drive conditions (output and speed), and

## 2. Safety

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- failure to monitor machine parts that are subject to wear, and
- use of unapproved replacement and wear parts.

Use only original replacement and wear parts. When using external parts, it cannot be guaranteed that they are constructed and manufactured to be suitable and safe.

### 2.4 Safety regulations

#### 2.4.1 Organizational measures

Inspect all available safety devices regularly.

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

#### 2.4.2 Protective equipment

Before commissioning the grinding machine, ensure that all protective equipment is properly mounted and in functional condition.

Protective equipment may be removed only after the grinding machine has stopped and has been secured against accidental restart.

When subcomponents are provided, the protective equipment must be attached by the operator as stipulated.

#### 2.4.3 Informal safety measures

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

All safety alert symbols and danger warnings on the grinding machine must be complete and clearly legible.

#### 2.4.4 Selection and qualification of personnel

Only trained and instructed personnel may work on the grinding machine. Observe the legally permitted minimum age!

The responsibilities of personnel with respect to commissioning, operation, maintenance, and repair must be clearly specified.

Personnel still undergoing training or instruction may only work on the grinding machine under the permanent supervision of an experienced person!

## 2. Safety

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### 2.4.5 Machine control system

Only trained and instructed personnel are permitted to activate the machine.

### 2.4.6 Safety measures in normal operation

Do not operate the machine in any unsafe manner. Only operate the grinding machine if all the safety devices are installed and fully functional.

Check the grinding machine for external signs of damage and correct operation of the safety devices at least once every shift.

Report any changes present (including those of the operating behavior) to the responsible office or person. If necessary, shut down the grinding machine and secure it against restart.

Before activating the grinding machine, ensure that no one will be injured by the start-up of the machine.

In the event of a malfunction, immediately stop the grinding machine and secure it against restart. Rectify malfunctions immediately.

### 2.4.7 Hazards due to electrical power sources

Work on electrical systems or operating materials may only be performed by a qualified electrician, in accordance with electrical regulations.

Defects, such as damaged cables, cable connections etc. must be immediately rectified by an authorized specialist.

### 2.4.8 Particular hazard zones

In the area around the wet-grinding belt and finned brush, clothing, fingers, and hair may be pinched and drawn in; exercise caution. Wear suitable personal protective equipment.

### 2.4.9 Servicing (maintenance, repair) and fault elimination

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

For all upkeep work, the grinding machine is to be disconnected from the power supply and secured against accidental restart. Remove power plug. Cordon off the maintenance area where required.

After completing maintenance work and fault rectification, install all safety devices and verify that they are fully functional.

## 2. Safety

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### 2.4.10 Structural modifications to the grinding machine

Modifications to or retrofits or rebuilds of the grinding machine are not allowed without the permission of the manufacturer. This also applies for installation and configuring the safety devices.

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

Immediately replace any machine parts that are not in a serviceable state.

Use only original replacement and wear parts. When using external parts, it cannot be guaranteed that they are constructed and manufactured to be suitable and safe.

### 2.4.11 Cleaning the machine

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

Dispose of parts subject to wear and replacement parts in a safe and environmentally-friendly manner.

### 2.4.12 Oils and greases

When using lubricants and grease, follow the safety provisions applicable to the product. Comply with the special regulations for the foodstuffs sector.

### 2.4.13 Relocation of the grinding machine

Disconnect the grinding machine from any external power, even if adjusting its position slightly. Before restarting the grinding machine, properly connect it to the power supply.

When loading or unloading, only use suspension devices and load suspension devices with sufficient load-bearing capacity. Designate suitable lifting devices for the lifting process.

Ensure that no one, who is not certified for this work, is located where the machine is unloaded and installed.

Only lift the grinding machine correctly with a suspension device in accordance with the operating instructions (attachment points for load suspension devices, etc.). Use only a suitable transport vehicle with sufficient carrying capacity. Secure loads safely. Use suitable attachment points. When recommissioning, do so only in accordance with the operating instructions.

# 3. Description

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## 3.1 Intended use

The USK 230 B - HV 208 II automatic grinding machine is used for grinding, deburring, and polishing all standard cutter knives as well as hand knives and other cutting tools.

## 3.2 Technical specifications

Height	1361 mm
Width	1800 mm
Depth	1943 mm
Space requirement (WxDxH)	2800 x 2800 x 200 mm
Weight (USK 230 B)	140 kg
Weight (HV 208)	170 kg
Current supply*	3x 400 V
Mains frequency*	50 Hz
Output (USK 230 B)*	2.6 kW
Output (HV 208)*	0.18 kW
Power consumption (USK 230 B)*	3.2 kW
Power consumption (HV 208)*	0.35 kW
Current consumption (USK 230 B)*	5.8 A
Current consumption (HV 208)*	0.5 A
Back-up fuse (USK 230 B)	16 A
Back-up fuse (HV 208)	10 A
Measured A-weighted emission sound pressure level at workstation LpA**	approx. 80 dB (A)
Compressed air connection	6 bar
Air consumption	50 l/min
Idle noise level of the wet-grinding belt	80 dB (A)
Operating noise level of the wet-grinding belt	84 dB (A)
Operating noise level of the finned brush	86 dB (A)

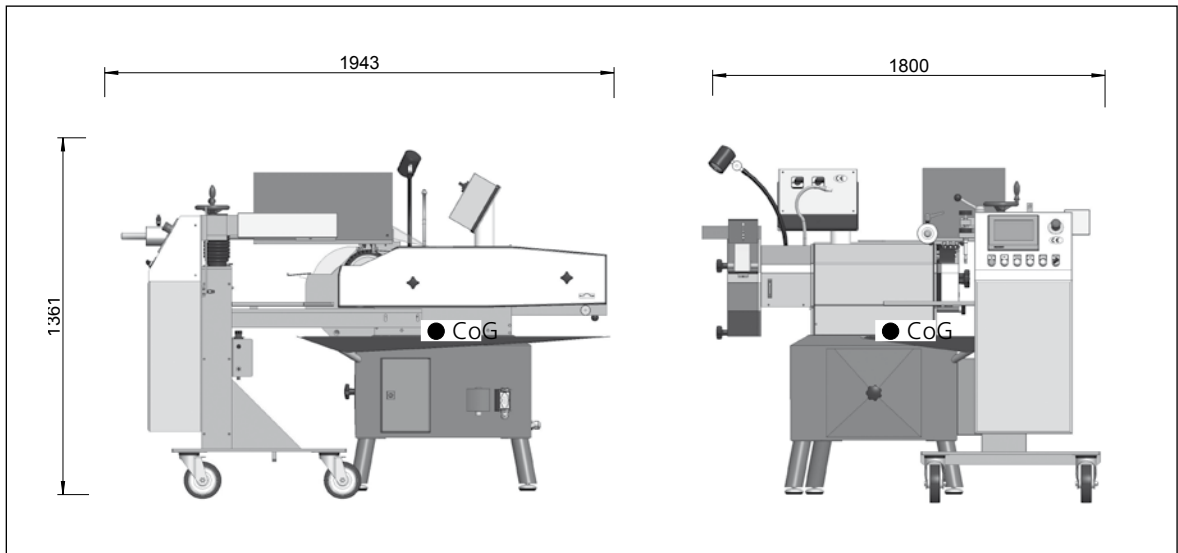
# 3. Description

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\*) This information may change depending on the electrical power supply.

\*\*) Two-digit sound emission value according to EN ISO 4871 (measurement uncertainty KpA. 3 dB(A)).  
Emission sound pressure level according to EN ISO 11201.

A K24 cutter knife from KNECHT Maschinenbau GmbH was ground.



**Figure 3-1** Dimensions in mm

## 3.3 Functional description

The automatic grinding machine can be used to grind, deburr, and polish linear, sickle-shaped, and circular knives.

All knives other than hand knives must be clamped onto grinding plates and ground on the wet-grinding belt with the respective attachments.

The grinding angle is set continuously between 5° and 35° on the copy grinding device.

Knives are deburred and polished on the finned brushes without attachments.

# 3. Description

## 3.4 Description of components



**Figure 3-2** Overall view of automatic grinding machine

- 1 Work light
- 2 Control panel for USK 230 B
- 3 Finned brush
- 4 Water tray
- 5 Water tank
- 6 Machine feet
- 7 Control panel for HV 208 copy grinding device
- 8 Wet-grinding belt
- 9 Toolbox



# 3. Description

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## 3.4.1 USK 230 B control panel



Figure 3-3 Control panel

- 1 Wet-grinding belt ON/OFF
- 2 Coolant pump ON/OFF

## 3.4.2 Coolant unit

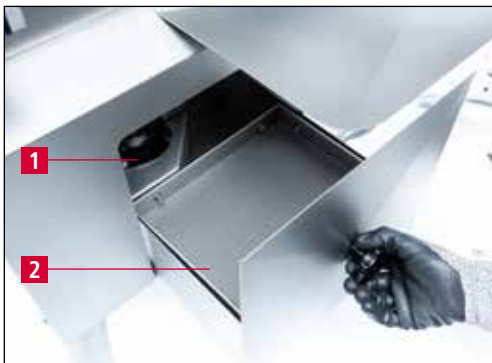


Figure 3-4 Coolant unit

- 1 Coolant pump
- 2 Water tank



Figure 3-5 Flow gauge

The grinding machine has a flow gauge (3-5/1) which automatically interrupts the program flow if there is no coolant flow.

The flow gauge is located on the top side of the machine and must be cleaned regularly.

# 3. Description

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## 3.4.3 HV 208 copy grinding device



- 1 Locking lever
- 2 Balance weight
- 3 Handwheel to set grinding angle

Figure 3-6 HV 208 copy grinding device

## 3.4.4 Switching the copy grinding device on / off



Figure 3-7 Copy grinding device main switch

The main switch (3-7/1) is located on the left side of the copy grinding device.

Turning the main switch from "0" to "I" switches on the copy grinding device.

Turning the main switch from "I" to "0" switches off the copy grinding device.

# 3. Description

## 3.4.5 HV 208 control panel



Figure 3-8 Control panel

- 1 Touch panel
- 2 "Emergency off" button
- 3 "Control ON" button: Activates controls (when button flashing)
- 4 "Start/Stop" button: Starts grinding program
- 5 "Change copy plate" button: manually runs the copy grinding plate
- 6 "Knife feed forward" button: Drive knife up to wet-grinding belt
- 7 "Knife feed back" button: Drive knife back from wet-grinding belt
- 8 "Manual/Automatic" selector switch

# 3. Description

## 3.4.6 Layout of user interface (main screen)

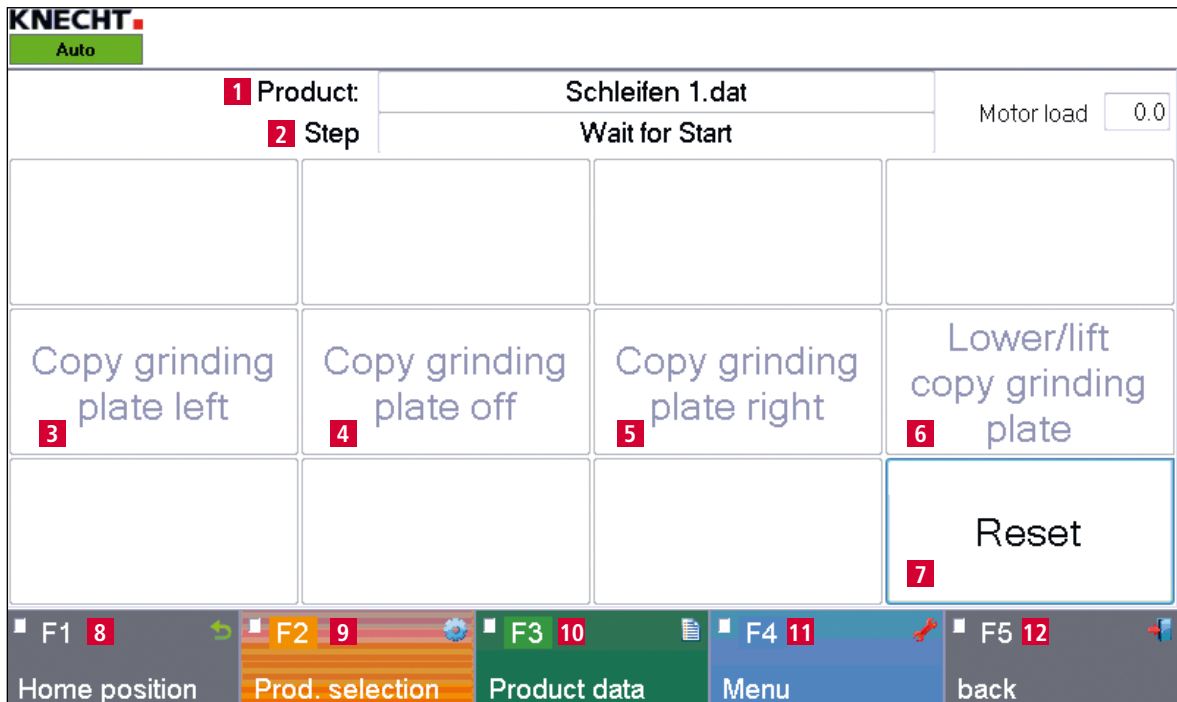


Figure 3-9 Main screen

- 1 "Product": display of selected product file
- 2 "Step": display of current program step
- 3 "Copy grinding plate left": run copy grinding plate to the left
- 4 "Copy grinding plate off": switch off copy grinding plate
- 5 "Copy grinding plate right": run copy grinding plate to the right
- 6 "Lower/lift copy grinding plate": lift/lower copy grinding plate
- 7 "Reset": delete temporary error messages
- 8 "F1 Home position": run copy grinding plate to initial position
- 9 "F2 Prod. selection": select product files
- 10 "F3 Product data": change product data parameter
- 11 "F4 Menu": configure settings and language of user interface
- 12 "F5 back": return to previous display

### NOTICE

The button assignments vary according to the current display screen. The respective assignment is indicated in text form.

## 3. Description

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### 3.4.7 SP 110 copy grinding plate



**Figure 3-10** SP 110 copy grinding plate

The knives are clamped onto a copy grinding plate (3-10/1) for machining.

A matching copy grinding plate is needed for each blade shape and size. Knives may only be ground using the SP 110 copy grinding plate.

Copy grinding plates for new knife types can be obtained from KNECHT Maschinenbau GmbH on request.

## 4. Transport

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

**Transport the grinding machine with the machine feet facing downwards.**

### 4.1 Means of transport

For transporting and for setting up the grinding machine, only use adequately dimensioned transport aids, e.g. truck, forklift or hydraulic lifting truck.

When using a forklift or a lifting truck, move the fork under the grinding machine.

Note the machine's center of gravity when transporting. The center of gravity (CoG) is shown in Figure 3-1.

### 4.2 Transport damage

If damage is detected upon unloading after the delivery is accepted, inform KNECHT Maschinenbau GmbH and the freight forwarder immediately. Refer directly to an independent specialist as needed.

Remove the packaging and shipping straps. Remove the shipping straps on the grinding machine. Dispose of packaging in an environment-friendly manner.

### 4.3 Transport to another installation site

For transport to another installation site, ensure that the space requirements are fulfilled (see chapter 3.2).

A permissible electrical connection must be provided at the new installation site. The grinding machine must sit tightly and securely.



**Work on the electrical unit is only to be carried out by an authorized specialist or one of our customer service representatives. Observe the local applicable safety and accident prevention regulations.**

# 5. Installation

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## 5.1 Selection of qualified personnel



We recommend having maintenance work on the grinding machine carried out by trained KNECHT personnel.

We are not liable for any damage resulting from improper installation.

## 5.2 Installation site

When determining the installation site, bear in mind the space required for installation as well as maintenance and repair work on the grinding machine (see chapter 3.2).

## 5.3 Supply connections

The grinding machine is provided with the corresponding connection cable.



Confirm that the machine is correctly connected to the current supply.

## 5.4 Settings

KNECHT Maschinenbau GmbH will configure the various components as well as the electrical system before delivery.

**ATTENTION**

Unauthorized changes to the preset values are not permitted and can damage the grinding machine.

# 5. Installation

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## 5.5 Initial start-up of the grinding machine

Place the grinding machine at the installation site on a level base.

Compensate for any unevenness in the floor using the adjustable machine feet by unscrewing them counterclockwise. The machine is aligned using a level.

Have an authorized electrician install the current supply on-site.

Completely install and inspect the protective equipment before commissioning.



CAUTION

**Have all protective equipment checked for proper functioning by authorized trained personnel before commissioning the machine.**

Have the compressed air supply installed on site by a qualified technician.



CAUTION

**Confirm that the machine is correctly connected to the pressurized air supply.**

**If connected incorrectly, pressurized air may leak, causing parts to spin and potentially injure someone.**

**Observe local safety and accident prevention regulations for pressurized air.**



## 6. Commissioning



**CAUTION**

All work on the machine may only be performed by trained personnel.

Observe the local applicable safety and accident prevention regulations.

There is a risk that hands, hair, and clothing may be pulled in while the grinding machine is switched on.

Serious injury may result. Wear personal protective equipment.



**Figure 6-1** Filling the water tank

Fill water tank (6-1/1) with approx. 15 liters of water.

Connect phase inverter plug with the on-site outlet (3x 400 V, 16 A).

Turn "Wet-grinding belt" switch (3-3/1) to "ON" position. The wet-grinding belt and finned brush will start rotating.



**Figure 6-2** Checking the direction of rotation

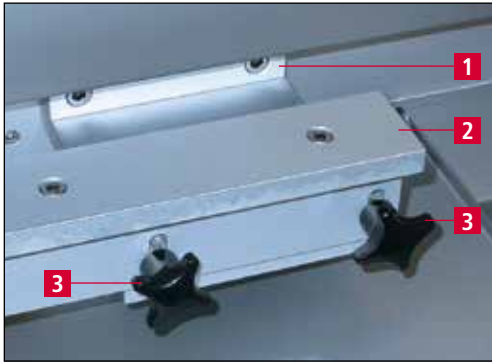
Check the direction of rotation of the finned brush.

The direction arrow (6-2/1) indicates the direction of rotation of the wet-grinding belt/finned brush. If the finned brush is rotating in the right direction, then the wet-grinding belt is also rotating in the correct direction.

If the direction is rotating in the wrong direction, have the phase reversed by a qualified electrician.

Switch off the grinding machine.

## 6. Commissioning



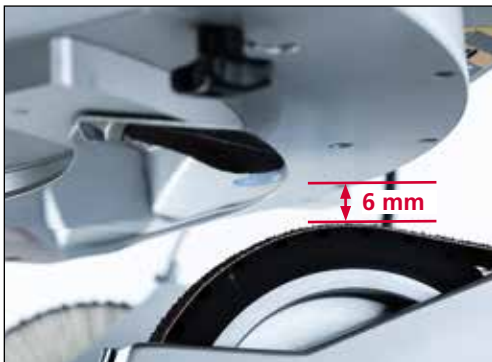
**Figure 6-3** Mounting the copy grinding device

Insert plug for the copy grinding device into the USK 230 grinding machine.

Completely install and inspect the protective equipment before commissioning.

Attach the copy grinding device spacer block (6-3/1) to the grinding machine using the two provided screws.

Then attach the clamping arm (6-3/2) of the HV 208 with the star handles (6-3/3) on the spacer block.



**Figure 6-4** Distance of copy grinding plate to wet-grinding belt

When calibrating the angle scale, a copy grinding plate is inserted into the machine with the corresponding knife.

Switch on the grinding machine.

Switch on copy grinding device using the main switch (3-7/1) and release "Emergency off" button (3-8/2).

Set the "Manual/Automatic" selector switch (3-8/8) to "Automatic" and press the "Start/Stop" button (3-8/4).

Check distance between wet-grinding belt and copy grinding plate. A distance of 6 mm is necessary for a grinding angle of 25°.

After presetting to approx. 6 mm, set the "Manual/Automatic" selector switch (3-8/8) to "Manual" and mount a new wet-grinding belt.

Set the "Manual/Automatic" selector switch (3-8/8) to "Automatic" and press the "Start/Stop" button (3-8/4). A bevel will now be ground onto the knife.

After the program ends, release the knife and measure the ground angle with the protractor provided.

## 6. Commissioning

---



**Figure 6-5** Clamping lever angle scale

Set the measured angle on the angle scale.

To do so, loosen the clamping lever (6-5/1) and push the angle scale (6-6/1) up in height until the measured angle is set.

Retighten the clamping lever (6-5/1).

Then set the desired angle using the "Set grinding angle" handwheel (6-6/2). Grind the knife again and check the angle.



**Figure 6-6** Angle scale

Readjust the scale again as needed.

Switch off copy grinding device and grinding machine.

# 7. Operation

---

## 7.1 General grinding fundamentals

If a cutting edge has become dull, material must be removed in order to reach its original sharpness.

To do so, the respective knife is ground to the cutting edge. While doing so, if a burr is created on the cutting edge, then the grinding process is complete and can be finished. Before creating the final sharpness, the resulting burr must be removed as part of an additional step. This is done with a finned brush.

As it is not only the sharp cutting edges but also the long service lives that define a blade, the cutting edge angle is another important indicator of a blade's performance. The smaller the cutting edge angle, the higher its theoretical service life. In practice, however, it seems that a cutting edge angle that is too small results in the cutting edge breaking off and thus becoming dull.

The cutting edge angle is therefore between 15° and 35°. For cutting edge angles below 15°, the cutting edge is so unstable that it snaps with the smallest resistance. For a cutting edge angle of more than 35°, the cutting edge angle is extremely stable, but this does reduce the service life.

The cutting edge profile is an additional criterion for the characteristics of the cutting edge.

There are three different ground surfaces:



Tapered ground surface



Convex ground surface



Concave ground surface

Convex ground surfaces can mostly be found on cutter blades and hand knives. Tapered and concave ground surfaces are predominantly found on circular knives and blades.

In essence: The profile and cutting edge angle stipulated by the manufacturer must be maintained.

# 7. Operation

---



For all work on / with the machine, the locally applicable safety and accident prevention regulations as well as instructions in the “Safety” and “Important notes” sections of the operating instructions must be observed.

## 7.2 Switching on the copy grinding device

Switch the main switch (3-7/1) of the copy grinding device to the “I” position. The “Emergency off” button (3-8/2) must be released.

Wait for the controls to initialize. The main screen will appear.

Press the “Control ON” (3-8/3) switch. The control is now activated.

Set the “Manual/Automatic” selector switch (3-8/8) to “Manual”.

## 7.3 Grinding the cutter knife

### 7.3.1 Mounting the copy grinding plate



**Figure 7-1** Moving the copy grinding device into change position

To clamp on the knife, swivel the drive unit to the change position.

Loosen the locking slide of the copy grinding device with the locking lever (7-1/1) and swivel the drive unit to the right using the balance weight guide rod (3-6/2).



**Figure 7-2** Mounting the copy grinding plate

Push the copy grinding plate (7-2/1) onto the guide carriage ball bearings (7-2/2) to the stop and press against the stop with the right hand.

Hold the “Change copy grinding plate” button (3-8/5) until the copy grinding plate has moved 2-3 cm.

# 7. Operation

---

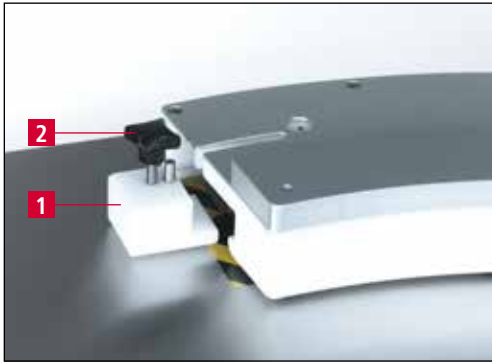


Figure 7-3 Mounting the limit switch cam

With the pin in front, push the limit switch cam (7-3/1) under the copy grinding plate and tighten the star handle (7-3/2).

The cam defines the end of the travel path and triggers movement in the opposite direction.

**ATTENTION**

**If the cam is not attached for the end position, the copy grinding plate will move down from the guide carriage and may fall off and become damaged.**

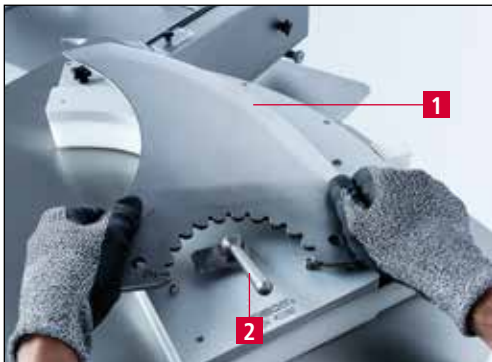


Figure 7-4 Clamping the cutter knife

Place knife (7-4/1) on the mounting for the copy grinding plate and turn latch (7-4/2) onto knife.



**Risk of injury on the chain sprocket; fingers, hair, and clothing may become entangled.**

**Sharp cutting edges. Serious cutting injuries may result!**

**Wear protective gloves.**

# 7. Operation



**Figure 7-5** Swiveling the copy grinding device to working position

Swivel the drive unit into the work position and lock the locking slide (7-5/1) of the copy grinding device using the locking lever (7-1/1).

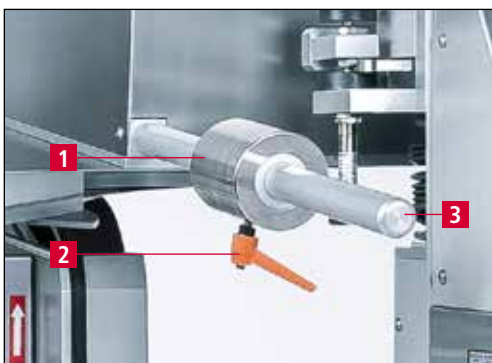
## ATTENTION

**Check whether the copy grinding plate is suitable for the knife before grinding the knife. (Compare the label of the copy grinding plate with that of the knife). The use of an unsuitable copy grinding plate can damage the knife and copy grinding plate.**

## NOTICE

**There is a suitable copy grinding plate for each type of cutter knife. KNECHT requires a sketch of the knife or a new knife in order to manufacture the grinding plate. If possible, specify the cutter type, blade radius and knife type.**

### 7.3.2 Setting the balance weight



**Figure 7-6** Mounting the copy grinding plate

The balance weight (7-6/1) is used to balance the decreasing aggressiveness of the wet-grinding belt due to wear by increasing the grinding pressure.

The farther the balancing weight is from the wet-grinding belt, the lower the grinding pressure will be.

The closer the balancing weight is to the grinding belt, the higher the grinding pressure will be.

The balancing weight (7-6/1) is fixed to the guide rods (7-6/3) using the clamping lever (7-6/2).

# 7. Operation

## 7.3.3 Setting the grinding angle



Figure 7-7 Setting the grinding angle

Set the grinding angle with the handwheel (7-7/2).

The grinding angle is read on the scale (7-7/1) at the point at which it leaves the machine housing.

## 7.3.4 Switching on the USK 230 grinding machine



Figure 7-8 Control panel USK 230

Set the switch for the wet-grinding belt (7-8/1) and the coolant pump (7-8/2) to "I" on the USK 230 control panel.

The wet-grinding belt and finned brush will start rotating and the coolant pump is switched on.

## 7.3.5 Starting the grinding process



Figure 7-9 Control panel

Set the copy grinding device to "Automatic" using the "Manual/Automatic" selector switch (7-9/4).

Select desired grinding program (see chapter 8.2) and press "Start/Stop" button (7-9/1).

If the wet grinding belt and the coolant pump are not running, set the switch for the wet grinding belt (7-8/1) and coolant pump (7-8/2) to "I" on the control panel of the USK 230.

Press the "Start/Stop" button (7-9/1) again.

The copy grinding plate will run to its initial position and lower to the wet-grinding belt. The "Start/Stop" button (7-9/1), "Knife feed forward" button (7-9/2), and "Knife feed back" button (7-9/3) will flash.



# 7. Operation

---

Using the “Knife feed forward” button (7-9/2), run the copy grinding plate to the wet-grinding belt until a grinding noise can be heard.

Press the “Start/Stop” button (7-9/1). The grinding program will start.

After completing the grinding process, the copy grinding plate will again run to its start position.

Remove knife and polish and deburr on the finned brush (see chapter 7.5).

After the second knife, only press the “Start/Stop” button (7-9/1) to start the grinding process. There is no need to press manually.



**Figure 7-10** Polishing/deburring the cutter knife



CAUTION

**Sharp cutting edges.**

**Serious cutting injuries may result.**

# 7. Operation

---

## 7.3.6 Canceling the grinding process



**Figure 7-11** Canceling the grinding process

By pressing the “Start/Stop” button (7-11/1), the program can be canceled at any time in order to, for example, check the resulting burr on the knife.

Pressing the “Start/Stop” button (7-11/1) again allows the user to restart. The machine will continue the grinding process at the location where it was stopped.

# 7. Operation

## 7.4 Replacing the copy grinding plate



CAUTION

Never change the copy grinding plate when the knife is clamped.

There is a risk of becoming crushed and entangled in the drive pinion.

Serious injury may result.

Press the "Change copy grinding plate" button (3-8/5) only when the copy grinding plate is mounted.

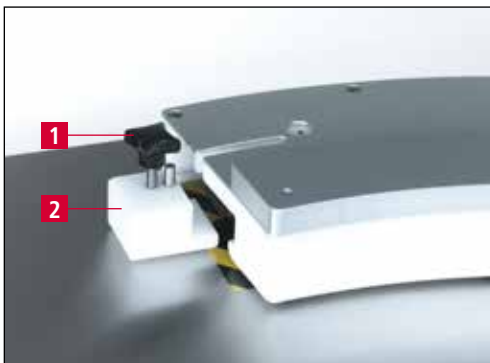


Figure 7-12 Changing the copy grinding plate

Loosen the star handle (7-12/1).

Remove limit switch cam (7-12/2).



Figure 7-13 Control panel

Set the "Manual/Automatic" selector switch (7-13/2) to "Manual" and hold the "Change copy plate" button (7-13/1) until the copy grinding plate can move no further.

The direction in which the copy grinding plate is moving can be changed by repeatedly pressing the "Change copy plate" button (7-13/1).

Allow the plate to run endlessly right. Release the button after the copy grinding plate has run completely out; the drive will stop immediately.

Remove copy grinding plate manually without tilting drive pinion and store carefully.

Lay the new copy grinding plate onto the drive pinion, press the "Change copy plate" button (7-13/1) and hold until the copy grinding plate is approximately in the middle.

With the pin in front, push the limit switch cam (7-12/2) under the copy grinding plate and tighten the star handle (7-12/1).

## 7. Operation

---

The copy grinding plate has now been changed. The copy grinding plate does not have to be in a defined position to start automatically.

If the stop for the copy grinding plate is attached on the right, it can be moved to the left and right in manual mode by pressing the "Change copy plate" button (7-13/1).

Pressing the button again will change the direction.

### NOTICE

**If the copy grinding plate is not fed in correctly, push it back by hand.**

# 7. Operation

---

## 7.5 Deburr cutter knife with the finned brush



CAUTION

There is a risk that hands, hair, and clothing may be pulled in while the grinding machine is switched on.

Never hold the cutting edge against the rotation direction of the finned brush.

Polishing gives rise to grinding particles that could enter the eyes. Wear safety glasses. Wear a face mask.

**Serious injury may result!**



**Figure 7-14** Polishing/deburring the cutter knife

The burr created on the knife during the grinding process is removed by the finned brush. This will help the cutter knife retain its final sharpness.

Hold the polishing paste briefly against the running finned brush before the polishing/deburring process.

To polish/deburr cutter knives, unclamp from the grinding device and run along the finned brush (7-14/1) at a steep angle.

Alternately polish the upper and lower side of the knife until the burr is removed.

# 7. Operation

## 7.6 Grinding hand knives on the wet-grinding belt



There is a risk that hands, hair, and clothing may be pulled in while the grinding machine is switched on.

Never hold the cutting edge against the rotation direction of the wet-grinding belt. Serious injury may result!



Figure 7-15 Grinding hand knives

Lay the hand knife flat onto the wet-grinding belt (7-15/1).

The cutting edge should run an angle to the grinding belt, not perpendicular. Press the knife onto the grinding belt with your free hand. The stronger the pressure, the more convex the grind will be.

Pull both sides of the hand knife over the grinding belt alternately until a burr is created over the entire cutting edge length.



Figure 7-16 Polishing hand knives

The burr on the knife is removed at the finned brush (7-16/1). This will help the hand knife retain its final sharpness.

Both sides of the knife blade are honed alternately on the finned brushes.

# 7. Operation

## 7.7 Changing the wet-grinding belt



For all work on the grinding machine, the locally applicable safety and accident prevention regulations as well as instructions in the “Safety” and “Important notes” section of the operating instructions must be observed.



Figure 7-17 Opening the belt protection hood

Loosen and remove both star handles (7-17/1) by turning them counter-clockwise and remove belt protection hood.



Figure 7-18 Belt release lever

Turn the belt relief lever (7-18/1) in the direction of the arrow up to limit stop.



**Do not switch on grinding machine when belt protection hood is removed!**

**Serious injury may result!**

# 7. Operation

---

Remove the used wet-grinding belt and place a new belt over the contact disc and guide pulley.

Turn the belt relief lever (7-18/1) against the direction of the arrow up to limit stop.

Turn the wet-grinding belt by hand and check to see if it is not grinding anywhere.

Mount the belt protection hood.

## ATTENTION

**Heed the running direction arrows on the inside of the grinding belt!**

**Only original grinding belts approved by KNECHT Maschinenbau GmbH may be used.**

**Incorrect grinding belts can result in overheated cuts that cause the knife to break.**

### 7.7.1 Belt adjustment



**Figure 7-19** Belt adjustment

If the grinding belt is not running in the center of the contact disc, it can be aligned with the belt adjustment (7-19/1).

Turning the belt adjuster (7-19/1) counter-clockwise makes the grinding belt run to the left.

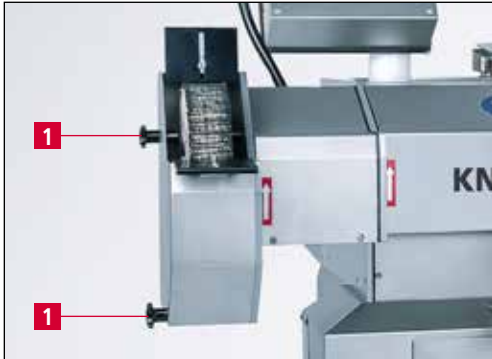
Turning the belt adjustment (7-19/1) clockwise makes the grinding belt run to the right.



# 7. Operation

---

## 7.8 Replacing the finned brush



**Figure 7-20** Changing the finned brush

To change the finned brushes, turn the star handles (7-20/1) counter-clockwise.

Then remove the guard carefully and clean as necessary.

Loosen the nut with the included flat wrench, carefully pull the old finned brush downwards, and replace with a new one.

Then mount the complete guard again in reverse order.

Verify that all parts are functioning properly!

### ATTENTION

**Only original finned brushes approved by KNECHT Maschinenbau GmbH may be used.**

**Incorrect finned brushes can damage the blades.**



CAUTION

**Do not switch on the machine with the protection hood is removed!**

**Serious injury may result!**

# 8. Control

## 8.1 Main screen

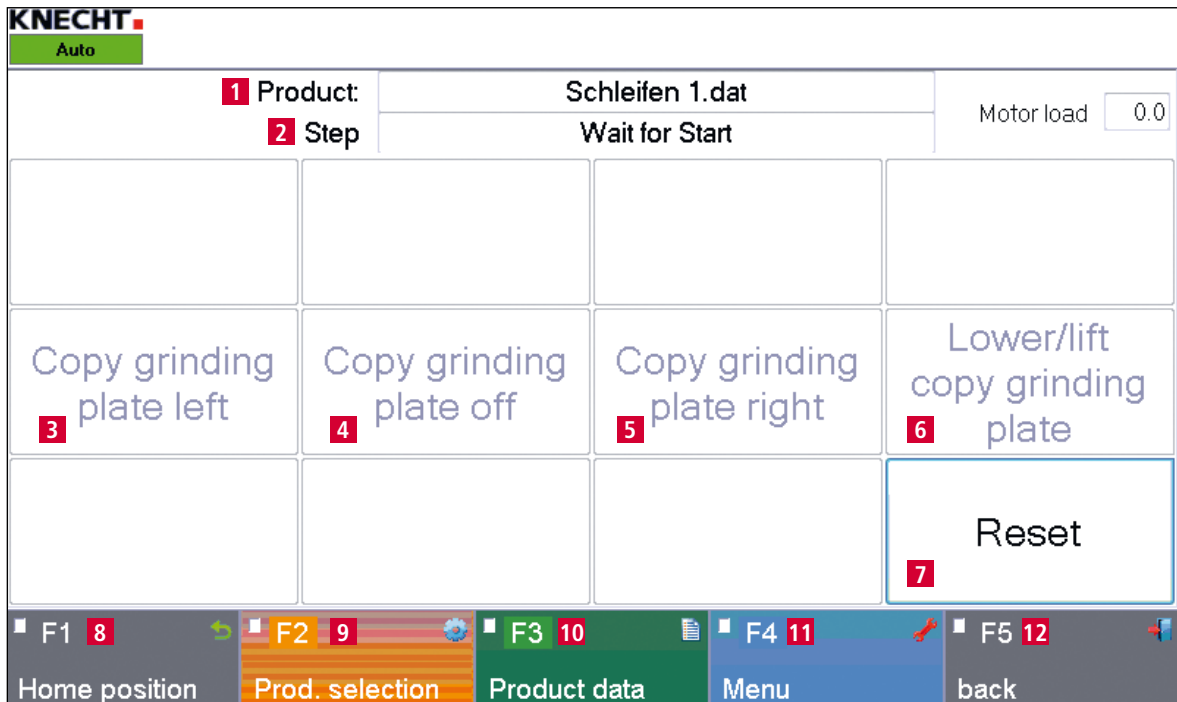


Figure 8-1 Main screen

- 1 "Product": display of selected product file
- 2 "Step": display of current program step
- 3 "Copy grinding plate left": run copy grinding plate to the left
- 4 "Copy grinding plate off": switch off copy grinding plate
- 5 "Copy grinding plate right": run copy grinding plate to the right
- 6 "Lower/lift copy grinding plate": lift/lower copy grinding plate
- 7 "Reset": delete temporary error messages
- 8 "F1 Home position": run copy grinding plate to initial position
- 9 "F2 Prod. selection": select product files
- 10 "F3 Product data": change product data parameter
- 11 "F4 Menu": configure settings and language of user interface
- 12 "F5 back": return to previous display

# 8. Control

## 8.2 Selecting product files

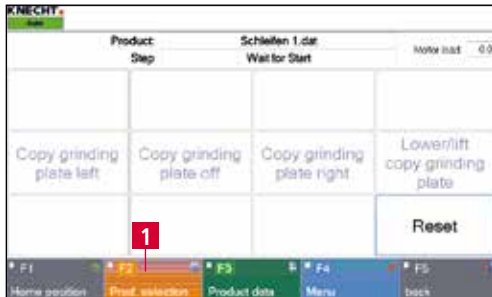


Figure 8-2 Main screen

A specific product file is saved for every grinding task. This product file must be selected and loaded before grinding in automatic mode.

This is done as follows:

Press "F2 Prod. selection" (8-2/1) on the touch panel. A new window (8-3) will open.



Figure 8-3 Selecting product file

Select the required product file; it will be underlined in blue.

Load the product file to the controller via the "F4 Activate" (8-3/1) touch panel button.

The program will switch back automatically to the main screen.

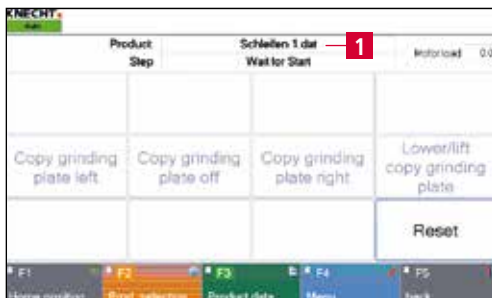


Figure 8-4 Main screen

The new product file will appear on the "Product" line (8-4/1). The new parameters are now loaded by the controller.

# 8. Control

## 8.3 Renaming, creating, and deleting product files



Figure 8-5 Main screen

Product files can be renamed, deleted, and recreated via copying.

This is done as follows:

Press "F2 Prod. selection" (8-5/1) on the touch panel.

A new window (8-6) will open.

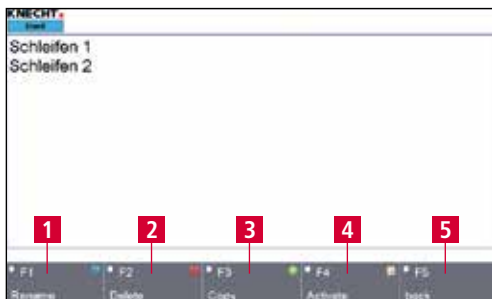


Figure 8-6 Editing product file

Select the required product file; it will be underlined in blue.

Select the corresponding field on touch panel: "F1 Rename" (8-6/1), "F2 Delete" (8-6/2), or "F3 Copy" (8-6/3).

### 8.3.1 Renaming product file



Figure 8-7 Renaming product file

If "F1 Rename" (8-6/1) is pressed, the image to the left will open (8-7).

Edit file name (8-7/1) with the keyboard and confirm with "OK" (8-7/2).

The window will close. The renamed file will appear in the product file directory.

Then select a product file with "F4 Activate" (8-6/4) or return to the main screen with "F5 back" (8-6/5).

# 8. Control

---

## 8.3.2 Renaming product file



**Figure 8-8** Creating product file

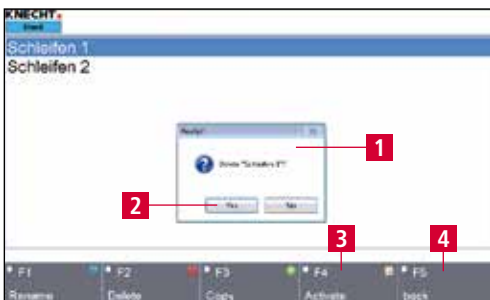
If "F3 Copy" (8-6/3) is pressed, the image to the left will open (8-8).

Edit file name (8-8/1) with the keyboard and confirm with "OK" (8-8/2).

The window will close. The new file will appear in the product file directory.

Proceed as described in chapter 8.4 to edit the product file parameters.

## 8.3.3 Deleting product file



**Figure 8-9** Deleting product file

If "F2 Delete" (8-6/2) is pressed, a popup window (8-9/1) will open.

Confirm with "Yes" (8-9/2), cancel with "No".

The popup window will close.

Then select a product file with "F4 Activate" (8-9/3) or return to the main screen with "F5 back" (8-9/4).

# 8. Control

## 8.4 Editing product file parameters



Figure 8-10 Main screen

The parameters of a product file can be changed as follows:

Press the “F3 Product data” touch panel field (8-10/1) on the main screen.

A new window (8-11) will open.



Figure 8-11 Parameter groups

“Grinding” (8-11/1): Grinding process data (see chapter 8.4.1)

The active group is always shown with a green arrow. A group is activated by pressing on the name. The arrow will jump again and the group underlined in blue.

# 8. Control

## 8.4.1 Meaning of the "Grind" parameter

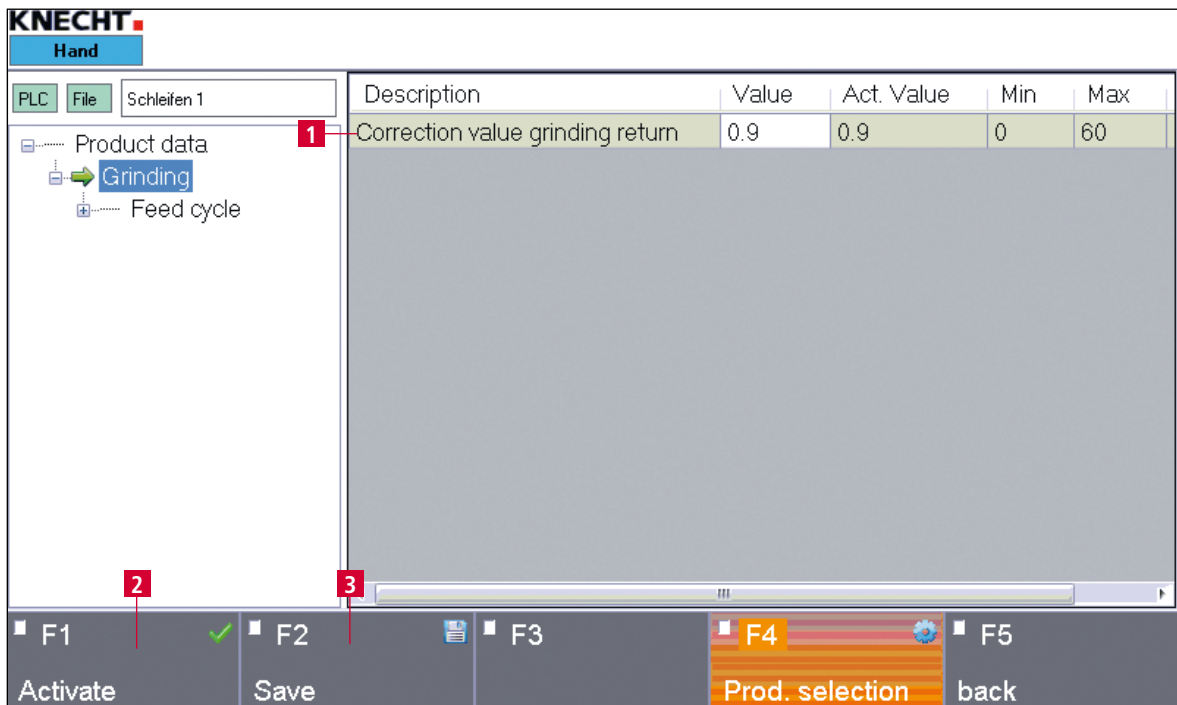


Figure 8-12 "Grinding" parameter

- 1 "Correction value grinding return": The positioning time of the cycle times will be added up and provides the basis for the return time. In order to compensate for imprecision, a correction value on the return time for return runs is entered when changing segments. The correction value is added to the total lead time.

To change the parameter, tap on the respective field highlighted in yellow. The window (8-13) opens for "Number", the window (8-14) for "Values".

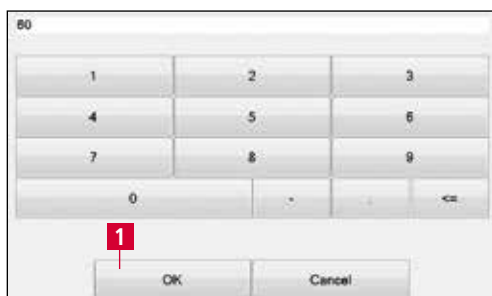


Figure 8-13 Editing "Number" parameter

Select the desired number and confirm with "OK" (8-13/1).

The touch panel field "Cancel" closes the window without recording the number.

## 8. Control

---



**Figure 8-14** Editing the “Values” parameter

### ATTENTION

Choose between “true” and “false” for values and confirm with “OK” (8-14/1).

The touch panel field “Cancel” closes the window without recording the value.

**Save the changed value with the touch panel field “F2 Save” (8-12/3).**

**If a current product file is changed, overwrite via the “F1 Activate” (8-12/2) touch panel control.**



# 8. Control

## 8.4.2 Meaning of the "Feed Cycles" parameter

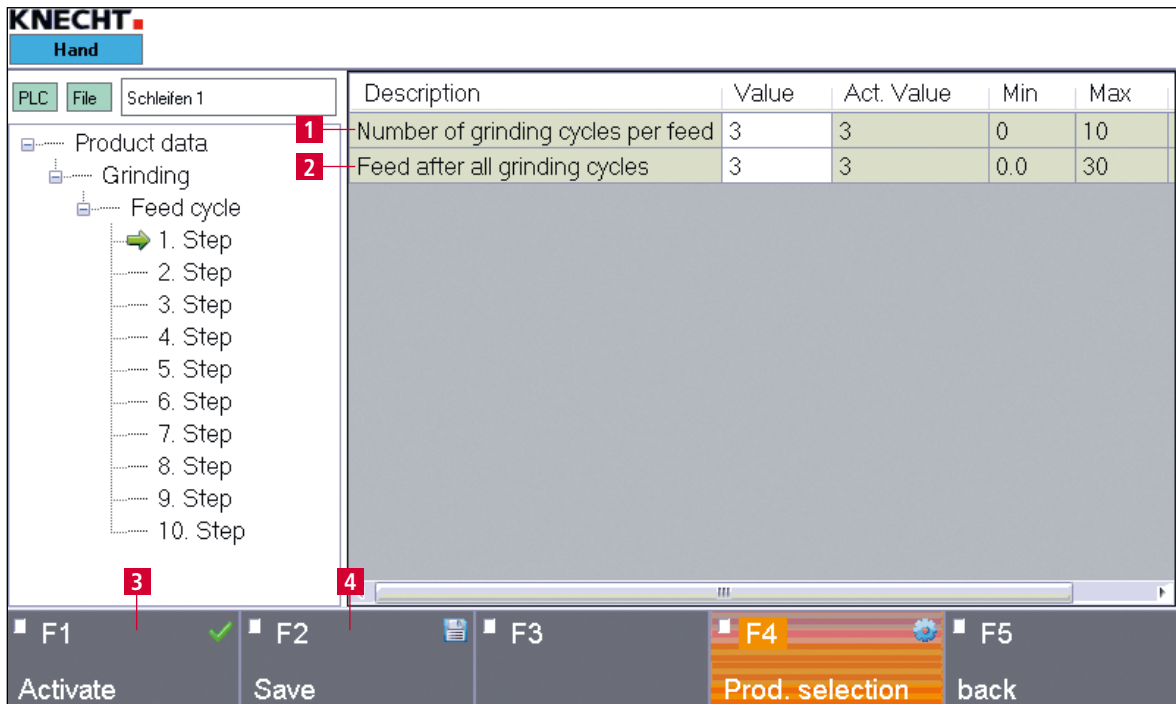


Figure 8-15 "Feed Cycles" parameter

- 1 "Number of grinding cycles per feed": Grinding cycles in the respective step; if the value is "0", the step will not be carried out
- 2 "Feed after all grinding cycles": Distance traveled by the knife after completing the respective step and moving to the next (in mm)

### NOTICE

The aforementioned parameters are related to steps 2 - 10.

To change the parameter, tap on the respective field highlighted in yellow. The window (8-16) opens for "Number".

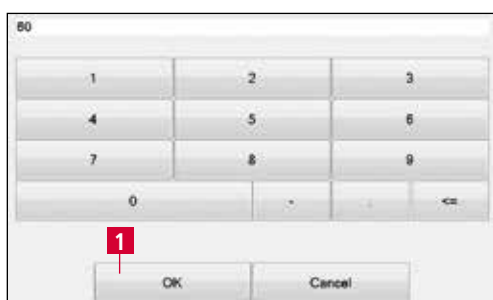


Figure 8-16 Editing "Number" parameter

Select the desired number and confirm with "OK" (8-16/1).

The touch panel field "Cancel" closes the window without recording the number.

## 8. Control

---

### **ATTENTION**

Save the changed value with the touch panel field "F2 Save" (8-15/4).

If a current product file is changed, overwrite via the "F1 Activate" (8-15/3) touch panel control.

# 8. Control

## 8.5 Machine data

The machine data is accessed via the main menu "F4 Menu" (8-1/11), to "F4 Options", and then "F1 Machine Data". The "Machine Data" display (8-17) shows the basic machine settings. The data are saved in a file and can be loaded again from the file.

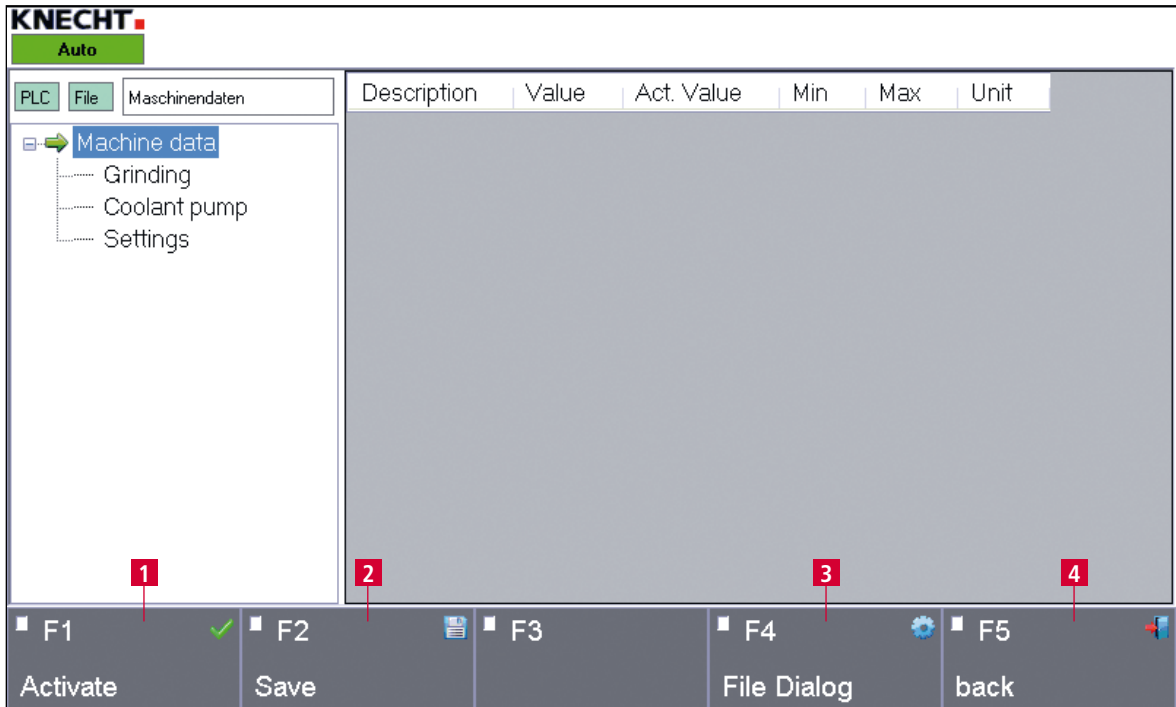
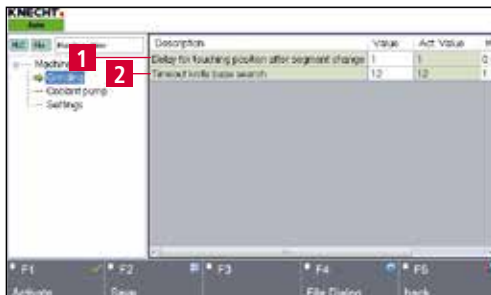


Figure 8-17 Machine data

- 1 "F1 Activate"
- 2 "F2 Save"
- 3 "F4 File Dialog"
- 4 "F5 back": return to previous display

### 8.5.1 Grinding



- 1 "Delay for touching position after segment change": (in s)
- 2 "Timeout knife base search": (in s)

Figure 8-18 Machine data "Grinding"

# 8. Control

## 8.5.2 Coolant controls

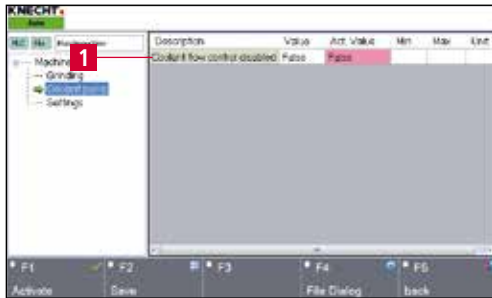


Figure 8-19 Machine data "Coolant flow control"

- 1 "Coolant flow controls disabled": true = coolant flow controls disabled, false = coolant flow controls enabled

## 8.5.3 Settings

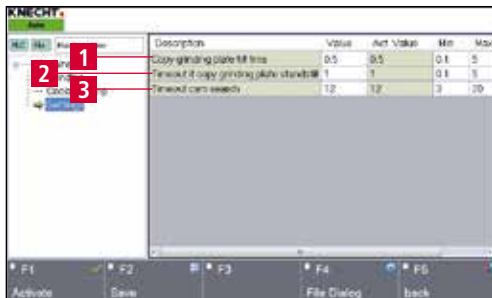


Figure 8-20 Machine data "Settings"

- 1 "Copy grinding plate tilt time": Hold time for lowering the copy grinding plate (in s)
- 2 "Timeout if copy grinding plate stand still": (in s)
- 3 "Timeout cam search": (in s)

# 8. Control

## 8.6 Language

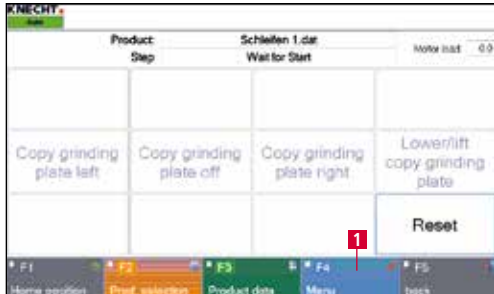


Figure 8-21 Main screen

The user interface language can be changed to the language of the country of use.

Press "F4 Menu" (8-21/1) on the touch panel to return to the menu.



Figure 8-22 Start screen

Press "F1 Language" (8-22/1) on the touch panel.

A new window (8-23) will open.



Figure 8-23 Selecting language

The desired language is selected and automatically activated by pressing the corresponding touch panel button (8-23/1).

Then press "F5 back" (8-23/2) on the touch panel to return to the menu (8-22).

The main screen appears by pressing "F5 back" (8-22/2).

# 8. Control

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## 8.7 Setting up an internet connection



Figure 8-24 Control cabinet

The machine has an Ethernet connection. Use the optional, integrated VPN router to create a secure connection between the machine and KNECHT Maschinenbau GmbH. The operator can activate or deactivate the connection using the key switch on the control cabinet (8-24).

Through this connection, KNECHT service technicians can access the controller and carry out a machine diagnosis, change software settings, and start or modify new grinding programs.

An active Internet connection is required to create the connection.

### NOTICE

**During commissioning, the VPN router will be configured to the specified IT infrastructure so that the machine can communicate only with KNECHT Maschinenbau GmbH over the VPN server. There is no communication within the customer network. The network is therefore completely protected.**

**To establish the Internet connection, connect the provided Ethernet cable to the existing on-site network socket (RJ 45) and the network connector (8-24/1) in the control cabinet.**

# 9. Care and maintenance

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For all work on the grinding machine, the locally applicable safety and accident prevention regulations as well as instructions in the “Safety” and “Important notes” section of the operating instructions must be observed.

## 9.1 Cleaning

Clean the grinding machine and copy grinding device each time after sharpening to prevent the grinding sludge from drying, hence making it harder to remove. There is a wash brush on the rear side of the grinding machine for this.

After cleaning, lightly grease the grinding machine and copy grinding device with non-corrosive oil. See also the lubrication schedule, chapter 9.2.1.

The coolant must be replaced on a weekly basis, and the container must also be cleaned.

### ATTENTION

**Do not spray-wash the grinding machine with water. This can damage the grinding machine!**

**The finned brush does not work when wet.**

## 9.2 Lubrication and maintenance



Figure 9-1 Flow gauge

The flow gauge (9-1/1) must be removed and cleaned 1x semi-annually.

To do so, disconnect the plug (9-1/2) and turn the flow gauge counter-clockwise by hand using a hex key. Clean the measuring probe with a clean cloth.

Lubricate the threading slightly (not the probe) and rotate back down.

Installation is carried out in the opposite direction.

# 9. Care and maintenance

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## 9.2.1 Lubrication schedule and lubricant table

Lubrication work	Cycle	OEST	SHELL	EXXON Mobil
Lubricate thread of star handles, clamping lever, and flow gauge	Semi-annually	L2 multipurpose grease	Gadus S2 V 100 2	Mobilith SHC 100
Oil machine parts after cleaning	After each grinding	Paraffinum Perliquidum 16L	Shell Risella 917	Marcol 82

## 9.3 Maintenance plan

Cycle	Assembly	Maintenance task
Weekly	Copy clamping plate	Clean and lubricate drive chain.
	USK 230 – water tank	Change coolant.
Monthly	HV 208 II – drive unit	Lubricate chain sprocket.
Semi-annually	HV 208 II – drive unit	Remove hood. Lubricate running and gliding surfaces.
	HV 208 II – base	Lubricate grease nipple.
Annually		Contact service department of KNECHT Maschinenbau GmbH.



# 10. Disassembly and disposal

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## 10.1 Disassembly

Dispose of all operating materials properly.

Secure moving parts against slippage.

Disassembly must be conducted by a qualified specialist.

## 10.2 Disposal

After the machine has reached the end of its service life, it must be disposed of by a qualified specialist. In certain situations, and after consultation with KNECHT Maschinenbau GmbH, the machine may be returned.

Operating materials (e.g. grinding belts, finned brushes, coolants etc.) must also be disposed of correctly.

# 11. Service, spare parts and accessories

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## 11.1 Postal address

KNECHT Maschinenbau GmbH  
Witschwender Straße 26  
88368 Bergatreute  
Germany

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

mail@knecht.eu  
www.knecht.eu

## 11.2 Service

### **Service line:**

For address, see postal address

service@knecht.eu

## 11.3 Spare parts

If you are in need of spare parts, please use the spare parts list provided with the machine. Please make your order using the format provided in the following.

### **When ordering, please always provide: (Example)**

Machine type	(USK230B-HV208II)
Machine number	(2381065230B)
Component designation	(water tank)
Designation of individual part	(submersible pump)
Item no.	(12)
Drawing no.	(410FA01-0594)
Quantity	(1)

We are always happy to answer any questions.

# 11. Service, spare parts and accessories

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## 11.4 Accessories

### 11.4.1 Abrasives used, etc.

Designation	Dimensions	Grain	Order number	Note
Wet-grinding belt	2200x60	80	412A-62-0725	
	2200x60	100	412A-63-0726	
	2200x60	120	412A-64-0727	
	2200x60	240	412A-66-0728	
Wet-grinding belt, compact grain	2200x60	180	412A-70-0180	Installed on delivery
Finned brush	d.340x60xd.25		412J-04-0509	Installed on delivery
Polishing paste	1200 g		412R-01-0501	Included in delivery

### ATTENTION

**Do not use any other abrasives without the approval of KNECHT Maschinenbau GmbH.**

**KNECHT Maschinenbau GmbH is not liable in the event that other abrasives are used.**

If you require wet-grinding belts, finned brushes, polishing pastes or other accessories, please contact our sales staff, partners, or KNECHT Maschinenbau GmbH directly.

Thank you for choosing KNECHT!

# 12. Annex

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## 12.1 EC Declaration of Conformity

in accordance with the EC Directive 2006/42/EC

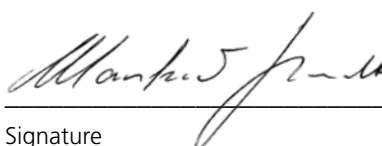
- Machinery Directive 2006/42/EC
- Electromagnetic Compatibility Directive 2014/30/EC

We hereby declare that the machine designated as follows, due to its construction and design as well as the version we sell, complies with the relevant basic safety and health requirements of the applicable EC Directive.

If the machine is modified in a manner that we did not condone, this declaration shall no longer be valid.

<b>Designation of the machine:</b>	Automatic grinding Machine
<b>Model designation:</b>	USK 230 B - HV 208 II
<b>Applicable harmonized standards, especially:</b>	DIN EN ISO 12100 DIN EN ISO 13857 DIN EN ISO 16089 DIN EN 61000-3-2 DIN EN 61000-3-3 DIN EN 55014-1 DIN EN 349
<b>Responsible for documentation:</b>	Peter Heine (B. Eng. Mechanical Engineering BA) Tel. +49-7527-928-15
<b>Manufacturer:</b>	KNECHT Maschinenbau GmbH Witschwender Straße 26 88368 Bergatreute Germany

Technical documentation is available and complete. The operating instructions document for the machine is available in its original version and in the native language of the user.

Bergatreute, December 3, 2019		Managing Director
Place, date	Signature	Signatory details

**KNECHT Maschinenbau GmbH**

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