

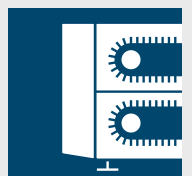
## OPERATING MANUAL GRINDING MACHINE

SMD 123 RE



**EN**

LISSMAC Maschinenbau GmbH  
Lanzstraße 4  
D-88410 Bad Wurzach  
Telephone +49 (0) 7564 / 307 - 0  
Fax +49 (0) 7564 / 307 - 500  
lissmac@lissmac.com  
www.lissmac.com







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Grinding machine SMD 123 RE

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Manufacturer:

LISSMAC  
Maschinenbau GmbH  
Lanzstraße 4  
D-88410 Bad Wurzach  
Telephone: +49 (0) 7564 / 307 - 0  
Fax: + 49 (0) 7564 / 307 - 500  
E-mail: [lissmac@lissmac.com](mailto:lissmac@lissmac.com)  
Web: [www.lissmac.com](http://www.lissmac.com)

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# **1 About this manual**

## **1.1 Target group**

The operating manual is directed at the machine operator and the operating and maintenance personnel.

This operating manual contains important information on how to operate the machine safely, properly and economically.

Each person responsible for operating and maintenance work on the machine must have read and understood this operating manual.

The operating manual is to be supplemented by directives for accident prevention and environmental protection, according to national requirements.

In addition to this operating manual, country-specific regulations for accident protection and also recognised technical regulations for safety and proper work are to be observed.

## **1.2 Additional documents**

Additional documentation of the respective manufacturers of individual components of the machine are available as supplements to this operating manual:

- Documentation exhaust system

### 1.3 Presentation of warnings

In this operating manual warnings are presented according to the following examples:

---

#### **SIGNAL WORD!**



##### **Type and source of danger**

Consequences of non-compliance

➤ Actions to avert the danger

---

The signal word under the danger symbol indicates the degree of danger:

 **DANGER**

This signal word signifies an extremely dangerous situation. If the situation is not avoided, fatal injuries will result. The danger symbol can specify the danger.

 **WARNING**

This signal word signifies a potentially dangerous situation. If the situation is not avoided, fatal or serious injuries can result. The danger symbol can specify the danger.

 **CAUTION**

This signal word signifies a dangerous situation. If the situation is not avoided, medium to slight injuries will result. The danger symbol can specify the danger.

**NOTE**

This signal word signifies a situation which presents risks to objects. If the situation is not avoided, property damage will result. The signal word is present without a danger symbol.

### 1.4 Additional representations

In this operating manual important information is presented according to the following examples:



Important information is denoted by "i".

---

#### **Requests and results**

Texts, which request action, are marked by a triangle (➤). The immediate effect of this action is marked as result (↪).

#### **Position numbers**

The positions of the figures are marked by numbers (1) in parentheses.

## 2 Safety

### 2.1 Safety instructions

The SMD 123 RE grinding machine is constructed according to the state of the art and recognised technical safety rules. However, during its use, danger for persons and property damage can occur.

- The machine is to be used only for intended use in technically faultless condition and in observance of safety instructions.

### 2.2 Organisational measures

Personnel authorised to work on the machine must have read and understood the operating manual before starting work. This applies notably to personnel who only work occasionally on the machine, e.g. for changeovers and service.

- The operating manual is to be kept permanently at the machine location and easily accessible.
- Perform checks for safe and hazard awareness work by operators while following the operating manual.
- If necessary or required by country-specific regulation, use personal protective clothing (e.g. work gloves, safety glasses, hearing protection).
- Observe all safety and danger instructions on the machine.
- Keep all safety instructions and danger warnings on the machine complete and in legible condition.
- No changes, removal or addition of parts to the machine without the written approval of the manufacturer.
- Only use original replacement parts from the manufacturer.
- Keep intervals for service work which are given in the operating manual.

### 2.3 Personnel selection and qualifications

Only authorised personnel of legal minimum age may work on the machine.

Personnel who are being trained or orientated on the machine may only work on the machine under continuous supervision of an experienced person.

- Only use trained or orientated personnel. Clearly establish responsibilities of the personnel for operating, maintaining and servicing.
- Establish a machine operator responsibility. The machine operator must refuse to follow instructions that are contrary to safety.

### 2.4 Transport

- Only use lifting gear and load carrying equipment with sufficient lifting capacity during loading work (see Technical Data for weights).
- Name an expert instructor for the lifting process.
- Only lift the machine properly with the lifting gear according to instructions in the operating manual. Only use the provided attachment points for the load carrying equipment.
- Only use suitable transport vehicles with sufficient load capacity.
- Reliably secure the machine during vehicle transport. Use suitable attachment points.
- Perform recommissioning after transport only according to the operating manual.



## 2.5 Normal operation

- Before beginning work become familiar with the operating location and working environment. The work environment includes, for example, work area obstructions and assistance options in case of accidents.
- Only operate the machine in a safe and functional condition.
- Refrain from working in any manner that is questionable in regard to safety.
- Immediately stop and secure the machine in case of malfunctions. Immediately correct malfunctions.
- At least once per shift (display indication) check the machine for externally recognisable damage and deficiencies. Report any changes occurring (including operating behaviour) to the responsible department or person. If necessary, immediately stop the machine and secure it.

## 2.6 Maintenance, Service and Troubleshooting

- Adjustment, maintenance and service work may only be carried out by authorised technical personnel.
- Perform adjustment, maintenance and service work according to instructions in the operating manual. Keep the specified intervals for service work.
- Inform operating personnel before beginning adjustment, repair, or maintenance work. Name a supervisor.
- Always disconnect the machine from electrical power during maintenance and repair work (main switch in the 0 position).
- When the machine is being cleaned of material residues, always disconnect the machine and the extraction system from the mains supply.
- Before cleaning with cleaning agents, close all openings with suitable materials in which no water or cleaning agent can penetrate, for safety or functional reasons. Electric motors and switches are especially at risk.
- Do not perform any cleaning with high pressure cleaners.
- Openings which were sealed before cleaning, must be completely opened after cleaning.
- Always tighten loosened screw connections with the specified tightening torques during maintenance and service work.
- If safety equipment is dismantled during changeover, maintenance, service and repair, remount and check the safety equipment immediately after the work is completed.
- Dispose of operating and auxiliary materials and replacement parts safely and in accordance with country-specific regulations.

## 2.7 Safety instructions for special types of dangers

### 2.7.1 Electric power

- Work on the machine's electrical systems may only be carried out by electricians according to the rules of electronics.
- In case of problems with the electrical power supply, turn the machine off immediately.
- When changing fuses only use original fuses with specified amperage.
- Regularly check the machine electrical equipment. Immediately correct deficiencies, such as loose connections or scorched cable.

### 2.7.2 Dust

- The machine may only be operated with a working dust extraction system compliant with country-specific regulations (e.g. EC Directive) and approved for steel dust.

- If carcinogenic substances are released during grinding (e.g. with stainless steel), the exhaust system must be operated with an absolute filter.
- The machine must be connected to a dust extraction system with wet extraction when grinding aluminium.
- Follow the operating manual of the exhaust system!
- All federal requirements for extraction systems for potentially explosive steel dusts must be met.
- It must be guaranteed that the continued operation of machine is impossible if the dust extraction system fails.
- The volume flow rate of the dust extraction system must be at least 3000 m<sup>3</sup>/hr.
- The flow velocity must be at least 20 m/sec.
- No dust deposits should form in the extraction pipes.

### 2.7.3 Fire hazard

- Do not process any workpieces which have been treated with a flammable corrosion resistant agent or flammable additive.
- Do not operate the machine near easily flammable materials.
- Make sure that the machine is always cleaned of machining residues according to the operating manual.



### 2.7.4 Explosion hazard

#### 2.7.4.1 Description of explosion hazard

The machining of aluminium produces flammable dust by grinding that, when mixed with air, can form a potentially explosive atmosphere. This also applies to the machining of steel and stainless steel.

During machining of aluminium, wet separators must always be used.

A mixture of steel and aluminium dust can produce an explosive gas during corrosion

Moreover, there is always the possibility that contact between water (e.g. air humidity) and aluminium dust can produce hydrogen gas, resulting in a gas explosions.




#### 2.7.4.2 Division of zones

The extraction of the aluminium or steel dust with a suitable extraction system (see Section 2.7.2) and performing the cleaning intervals (see Section 7.4) prevents the formation of an explosive atmosphere within the machine or in the suction pipes.

Only if this is ensured may the machine be operated.

### 2.8 Symbols on the machine

The following symbols are located on the machine and warn of dangers coming from the machine:

Symbol	Meaning
	This symbol on both conveyor belts indicates the danger, that hands or body parts can be pulled in and sheared off.
	This symbol on the control cabinet indicates dangerous electrical voltage.
	Risk of shearing from moving parts
	Read the operating manual and follow the information in the operating manual.
	Wear protective gloves when placing and removing workpieces.
	Wear safety glasses when working on the machine.
	Lubrication point
	Grinding mop height adjustment
	Rotation direction

### **3 Product description**

The SMD 123 RE grinding machine is described in the following (hereinafter referred to as machine)

#### **3.1 Appropriate usage**

The SMD 123 RE grinding machine is intended exclusively for the deburring and edge rounding of punch, laser, and fine plasma cut workpieces made of steel, steel alloys, aluminium or aluminium alloys.

Workpieces of 1.0 mm to 50 mm in thickness may be processed.

During machining of steel dry dust extractor must always be connected.

During machining of aluminium a wet separator must always be connected.

Absolutely follow the instructions for explosion hazard (see Section 2.7.4) and for machine cleaning (see Section 7.4). Only then is safe work possible.

Use for any other purposes is non-intended use.

The machine must only be installed in an indoor space, which meets the following conditions:

- Fortified, level floor with a load carrying capacity of at least 1.8 t.
- Temperature range from +10 to +40 °C
- Humidity 5 to 95 % (not condensing).

The manufacturer accepts no liability for damages which occur for use which is non-intended use.

### 3.2 Technical data

The following specifications apply to the SMD 123 RE grinding machine.

<b>Dimensions and weight of the machine</b>	length	1788 mm
	Width (incl. conveyor belt)	1595 mm
	height	1906 mm
	Total weight	1750 kg
<b>Electrical data of the entire machine</b>	Voltage	400V/50Hz / 480V/60Hz
	Network structure	3 ~ PEN / 3~PEN + N
	Rated current	41 A / 42 A
	Rated power	23 kW / 28,1 kW
	Rating power	28,5 kVA / 35 kVA
	Protection class	IP 42
<b>Grinding unit (R)</b>	Number of grinding motors	1
	Drive power per grinding motor	15 kW
	Grinding motor speed	2930 rpm
	Grinding motor voltage	400V / 480V
	Grinding motor power consumption	29 A
	Running speed of abrasive belts	2 to 18 m/s
<b>Edge rounding (E)</b>	Number of motors	4
	Drive power per motor	0,55 kW / 0,86 kW
	Motor speed	1405 rpm / 1704 rpm
	Motor voltage	400V / 480V
	Power consumption of motor	1,4 A / 1,7 A
<b>Feed</b>	Number of feed motors	1
	Drive power per feed motor	0.55 kW
	Feed motor speed	3440 rpm
	Feed motor voltage	400V / 480V
	Power consumption of feed motor	3,2 A
	Feed speed	0.5 to 8 m/min
<b>Sheet thickness</b>	Number of motors	1
	Drive power	0.12 kW
	Voltage	400V / 480V
	Power consumption	0.82 A

<b>Rotation</b>	Number of motors	1
	Drive power	0.75 kW
	Voltage	400V / 480V
	Power consumption	2,0 A / 1,8 A
<b>Pneumatics</b>	max. pressure	6 bar
<b>Environment</b>	Temperature range	+10 to +40 °C (air conditioning / heating otherwise required)
	Humidity	5 to 95 % (no condensation)
<b>Noise pressure level</b>	Emission noise pressure level at operator's place (average value, since it depends on the workpiece processed)	approx. 80 dB
<b>Workpieces</b>	Material thickness (height of opening for workpieces)	1.0 to 50 mm
	Aperture width for workpieces	80 mm to 950 mm
	Minimum length of workpieces in the direction of travel	150 mm
	Maximum workpiece weight	200 kg

### 3.3 Type plate

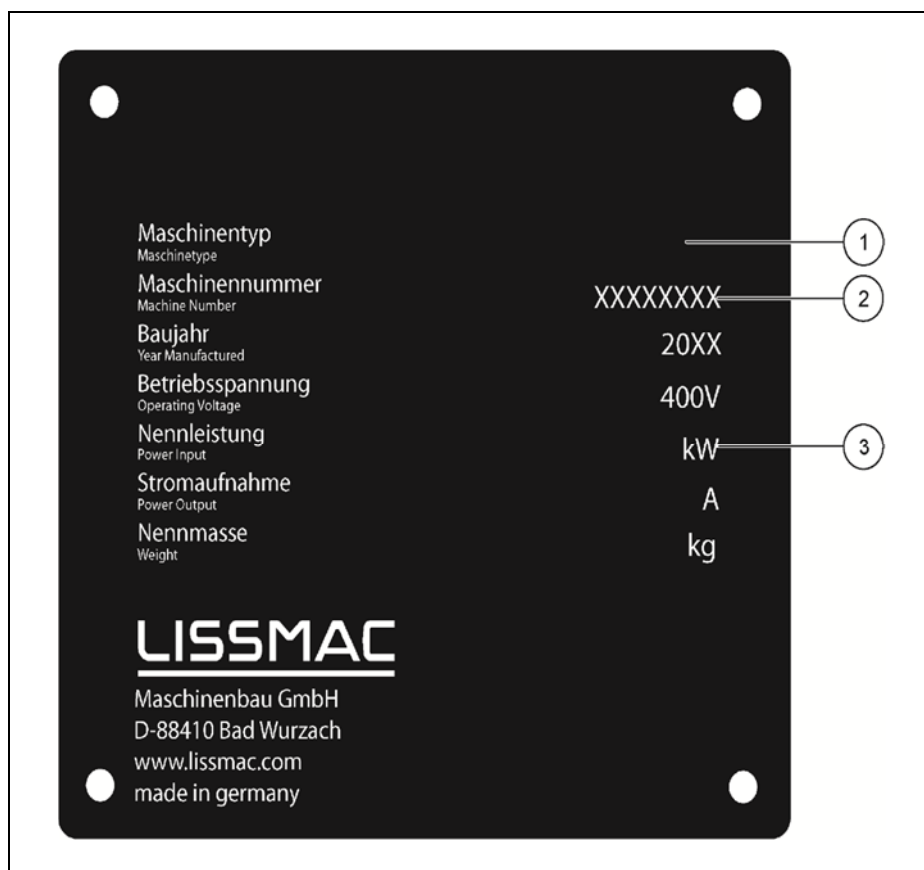


Abb. 1: Type plate

- 1 Name of machine
- 2 Serial number of machine
- 3 Connection values and weights

The type plate is located on the back of the grinding machine.

## 3.4 Set up of grinding machine

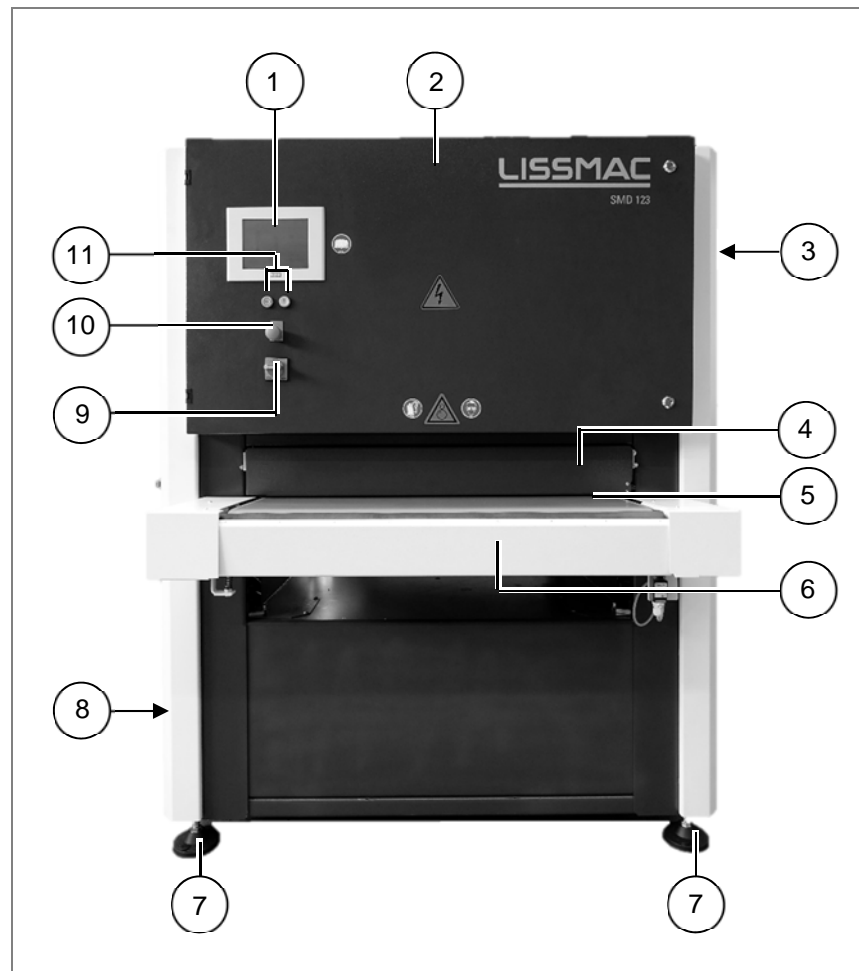


Abb. 2: Components of the machine, input side

- 1 Control and display field
- 2 Control cabinet
- 3 Machine door, right
- 4 Safety shut off bar
- 5 Conveyor belt
- 6 Safety shut off bar
- 7 Adjustable machine foot
- 8 Machine door, left
- 9 Main switch
- 10 "EMERGENCY STOP" button
- 11 Control elements





Abb. 3: Components of the machine, output side

- 1 Back wall, top
- 2 "EMERGENCY STOP" button
- 3 Type plate
- 4 Conveyor belt

### 3.5 Control elements

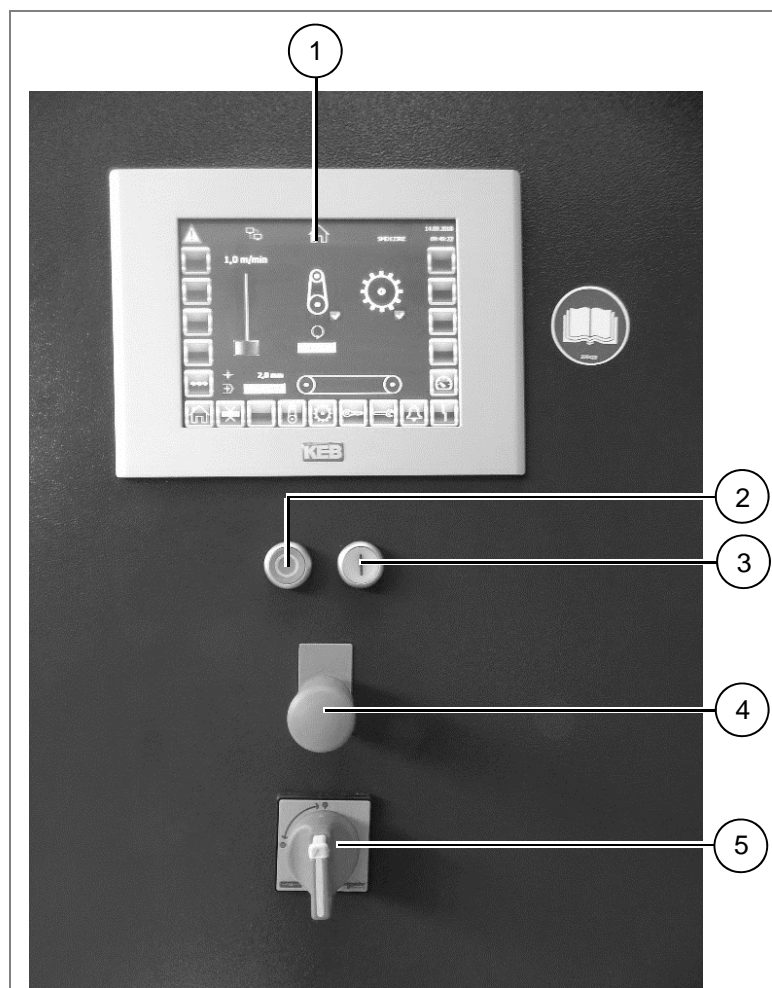


Abb. 4: Control and display elements (front side)

- 1 Control and display field
- 2 "Stop" button
- 3 "Start" button
- 4 "EMERGENCY STOP" button
- 5 Main switch

## 3.6 Machining units

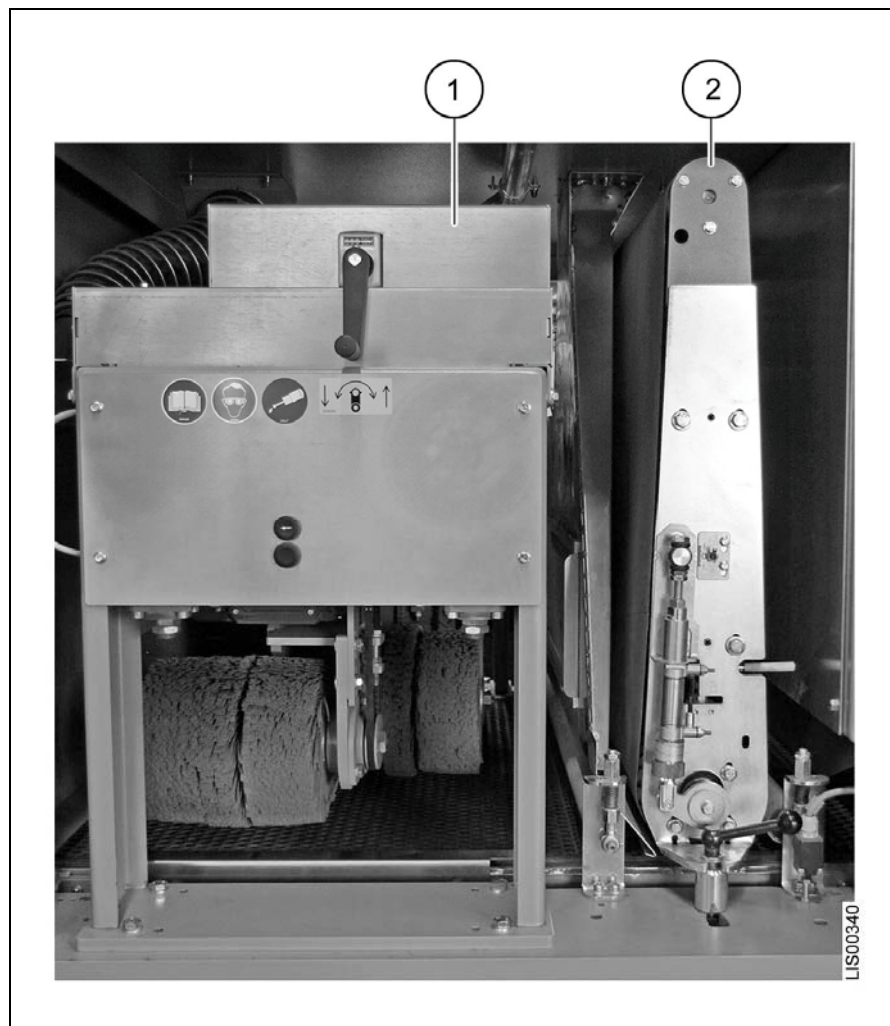


Abb. 5: Machining unit, top

- 1 E-Assembly
- 2 R-Assembly

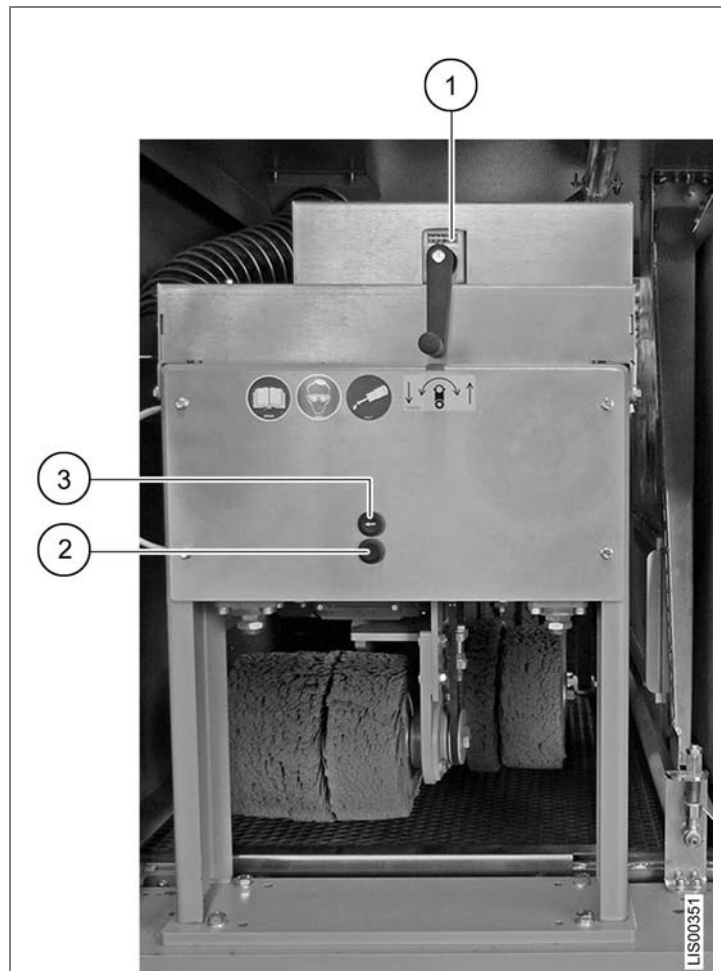


Abb. 6: Interior control elements, left

- 1 Grinding mop height adjustment crank
- 2 Grinding mop button
- 3 Conveyor belt button



The crank and the buttons are only used for manual fine adjustment of the distance between the abrasive and workpiece.

### 3.7 Function

There are two processing units built into the grinding machine, each in different designs.

The R-device (2) has an oscillating grinding belt and removes burrs from workpieces that were made with a flame cutter.

The E-device (1) consists of a beam on which the two grinding units are attached. On each grinding unit there are two grinding mops attached, which are each driven opposite via its own motor. The grinding mops are used for rounding the workpiece edges.

In the machine, workpieces are transported on a conveyor belt (3) under the machining units.

#### Material thickness and positioning of machining units

The machining units are positioned at the correct height by the controls via the setting of the sheet metal thickness on the control and display field. Each machining unit can be additionally manually positioned for service and adjustment.

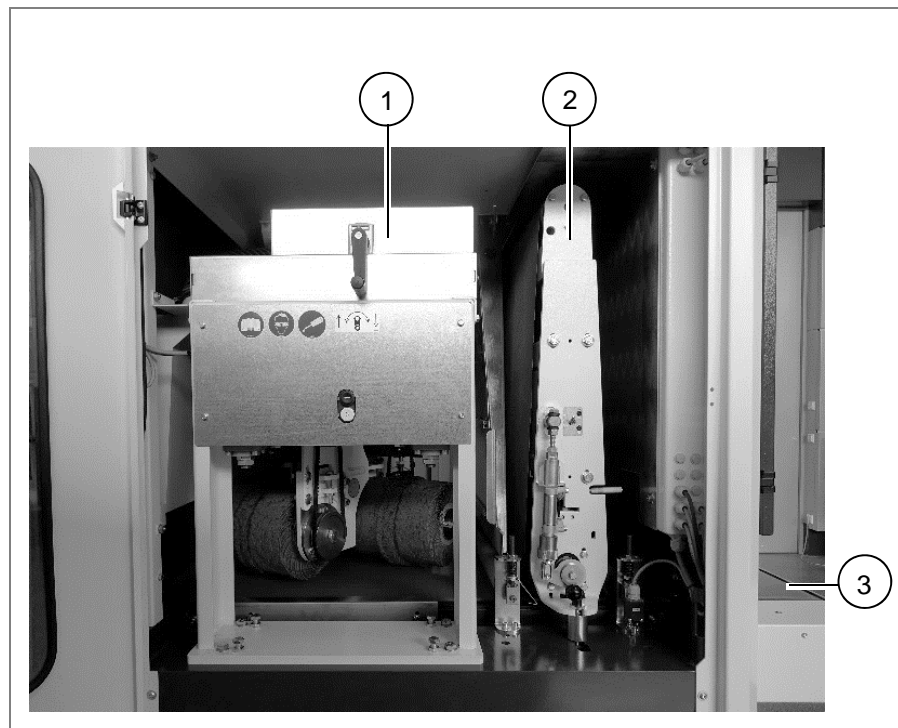


Abb. 7: Functional elements

- 1 E-Assembly
- 2 R-Assembly
- 3 Conveyor belt

### 3.8 Safety equipment

The machine has the following safety equipment:

- EMERGENCY STOP button (1) on the front and on the back of the machine (for the immediate shutdown of the machine in case of emergency)



The "EMERGENCY STOP" buttons must be again unlocked after removing the cause for the Emergency Stop situation.

- The safety shutdown bars (2) and (3) on the input side (switch off when the feed (conveyor belt) and devices are touched)
- Electrical contacts on the left and with the right side of the machine (switches off when opening the doors of the R-device, the E-device and the feed)
- Sheet thickness protection (4) (switches off the feed and the devices if a workpiece thicker than set is fed into the machine)
- Motor overload switch (prevent overloading of the motors)

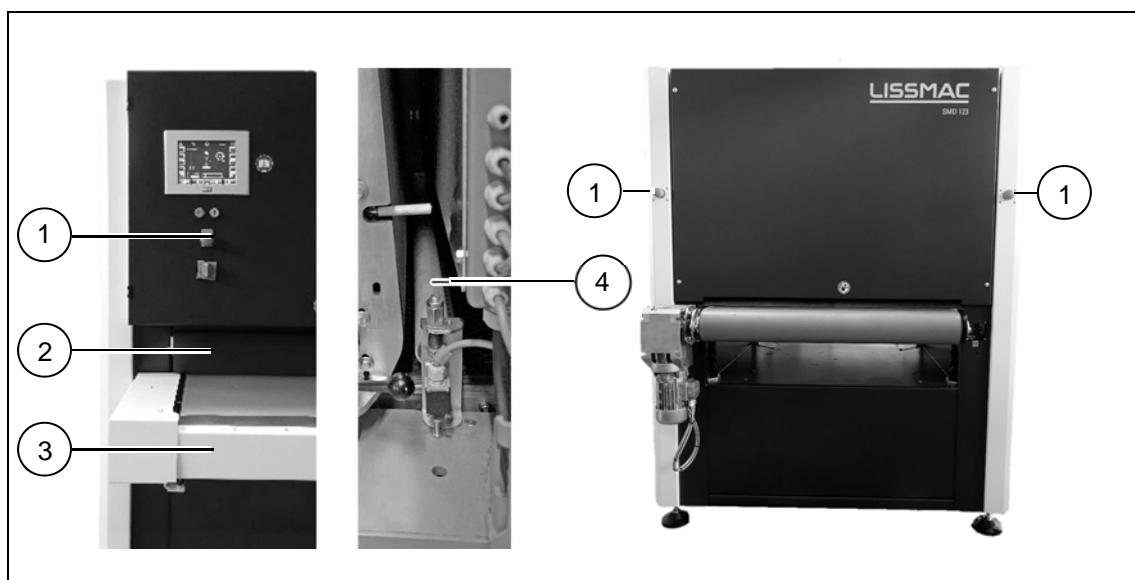


Abb. 8: Safety equipment of the grinding machine

- 1 "EMERGENCY STOP" button
- 2 Safety shut off bar
- 3 Safety shut off bar
- 4 Sheet thickness protection

## 4 Preparation for use

### 4.1 Transporting the machine

For transport of the machine by crane, there are two steel carriers (1) fastened to the top of the machine with attachment points. Two braces (2) are mounted between the steel carriers (1) (for tightening torque refer to Section 7.3). There is a suspension point (3) located on each end of the steel carriers (1).



### WARNING



#### Heavy loads

Injury from falling parts.

- Do not stop under the lifted machine.
- Only use lifting gear and loading equipment with sufficient lifting capacity and length.

- To lift the machine, secure an appropriate lifting gear on the four attachment points.
- Secure the machine by the four suspension points (3) with suitable lashing straps when transporting on a vehicle.

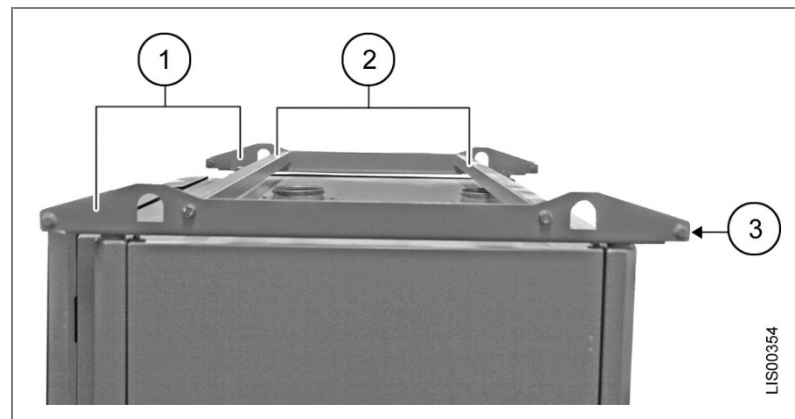


Abb. 9: Transport supports

- 1 Steel carriers with suspension points
- 2 Braces
- 3 Suspension point

## 4.2 Storing the machine

- Disconnect the electrical and pneumatic connections to the machine.
- Thoroughly clean all grinding dust and material residue from the machine.
- Clean the dust extraction shafts using an industrial vacuum cleaner.
- Lubricate machine.
- Pack the machine in plastic film for storage.
- Do not store the machine outdoors.
- Only store the machine in dry interior rooms.

## 4.3 Installation and assembly

### 4.3.1 Installing machine



### WARNING



#### Heavy loads

Injury from falling parts.

- Do not stop under the lifted machine.
- Only use lifting gear and loading equipment with sufficient lifting capacity and length.

- Fasten suitable hoisting gear to the four attachment points and transport the machine with the loading equipment to the installation location.
- Remove the packaging from the machine.
- Set up the machine on a fortified, level floor with at least 1.8 t load carrying capacity.
- Use the adjustable machine feet to level the machine in all directions.

### 4.3.2 Connecting the extractor system

Observe the regulations for your extractor system and clarify these with the manufacturer as necessary. All national requirements for explosive steel dust must be met.

#### Extractor volume flow

Extractor pipes are installed in the grinding machine. These lead to a central point at the side or on the top of the machine. The flow speed in the pipe must be **at least 20 m/s** in order to achieve the best results. The specified volume flow must be complied with.

LISSMAC:

SMD 123 RE

min. 3000 m<sup>3</sup>/h



At the connection point, the piping should have the following diameter:

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diam. 180 mm

- Connection of the grinding machine to the extractor system with seamless pipes with integrated cleaning flaps.



To prevent the danger of dust deposits in the extractor pipes, only use seamless extractor pipes (not corrugated pipes). Provide inspection/cleaning flaps on all horizontal pipe sections upstream or downstream of pipe bends. Remove dust deposits via the inspection / cleaning flaps. Only use approved cleaning agents.



The extractor pipes must be grounded in order to prevent electrostatic charging. To avoid the danger of dust deposits in the extractor pipes the volume flow must be complied with.

On top of, or at the rear of the machine, there is an interface (pipe connection), which is connected to the extractor system.



## DANGER



### High voltages

Death or injury due to electric shock.

- Connection and function testing must only be carried out by a qualified electrician.

- Connect the extraction system to the power supply.

➔ **See the circuit diagram for the interface**

## 4.3.3 Connecting the machine

 **DANGER****High voltage**

Death or injury from electric shock.

- Work on the machine's electrical systems may only be carried out by electricians according to the rules of electronics.

- Place the main switch on the back of the machine into the "0" position.
- Connect the machine to the power supply (see layout)
- Connect compressed air supply on the pneumatic coupling box (1).
- Unlock all three "EMERGENCY STOP" buttons.



The machine is delivered ready for connection to a right-hand power supply. When connection to the mains supply pay attention to the correct phase sequence.

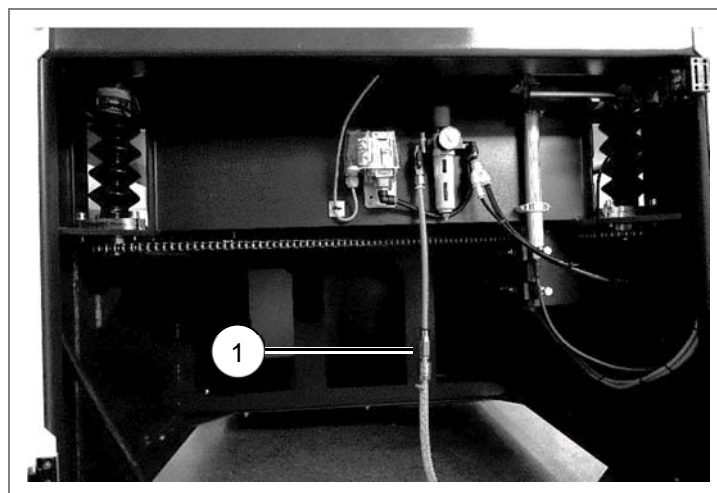


Abb. 10: Connecting the machine

1 Pneumatic coupling

## 5 Operation

### 5.1 Control elements

The central functions of the machine are controlled using control elements and the control and display field on the front of the machine.

The machine is switched on or off using the "Start" (2) and "Stop" (3) buttons.

The control and display field (1) is designed as a touchscreen and has the following functions:

- displays current settings
- displays machine status
- input of parameters
- acknowledge error messages
- Starting the machine

The functions of the control and display field are described in Section 5.2.

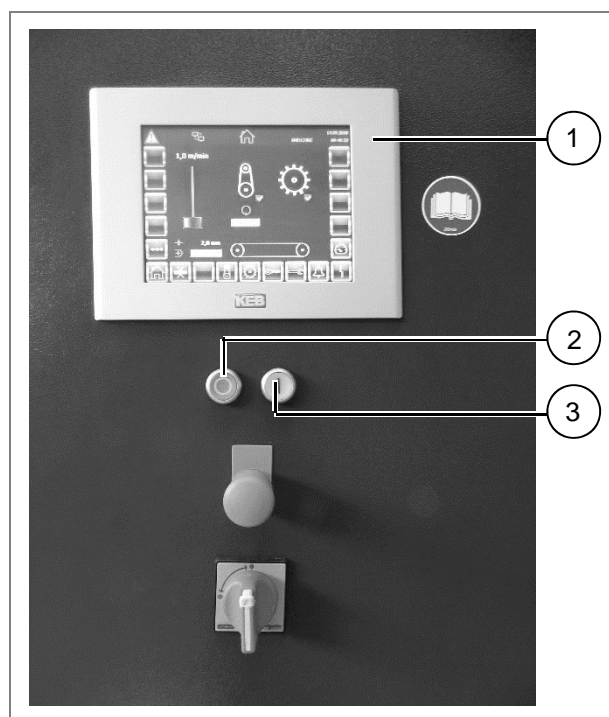


Abb. 11: Control elements

- 1 Control and display field
- 2 "Start" button
- 3 "Stop" button

### 5.2 Operating the control and display field

#### 5.2.1 Screen set up

All functions and information of the machine are displayed on the touchscreen of the control and display field. Values or settings can be changed by touching buttons on the surface of the touchscreen.

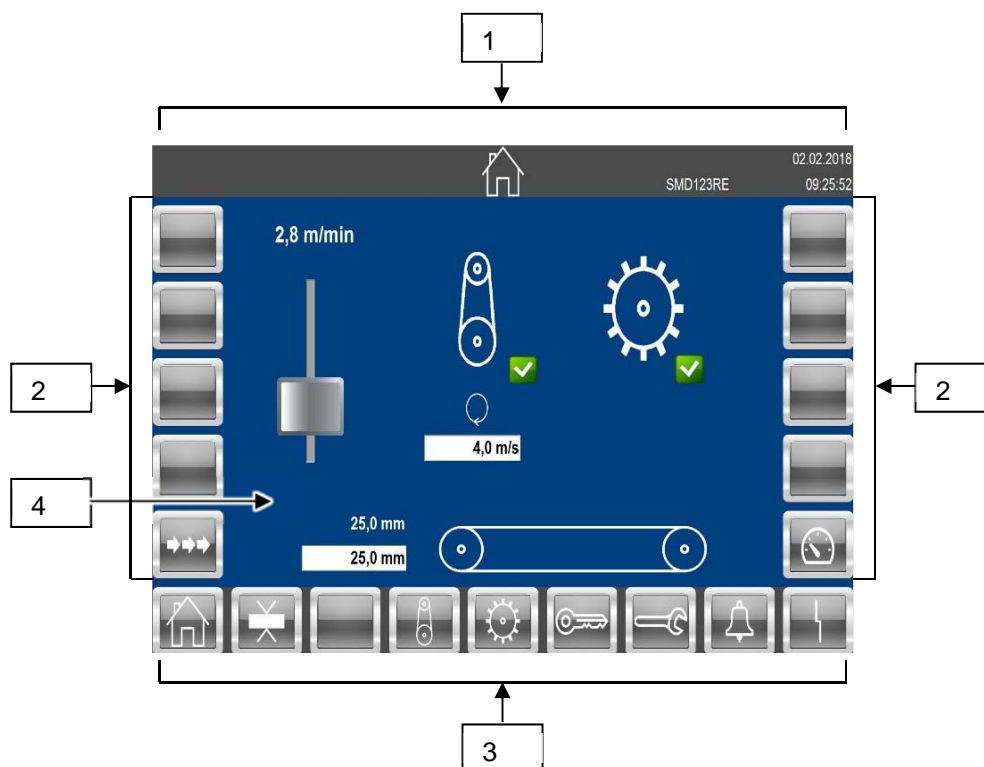


Abb. 12: Screen set up

Item	Function
1	Info area. The status of the machine with errors, the current selected screen and date and time are displayed in the info area.
2	Function buttons. The function buttons are screen-dependent and change depending on the screen display.
3	Constant buttons. The individual screens can be selected using the constant buttons. The constant buttons remain the same for each screen.
4	Main screen. Adjustment values and devices of the machine are shown on the main screen. A selected device is shown in white, a deselected device is shown in grey.

### 5.2.2 Screen symbols

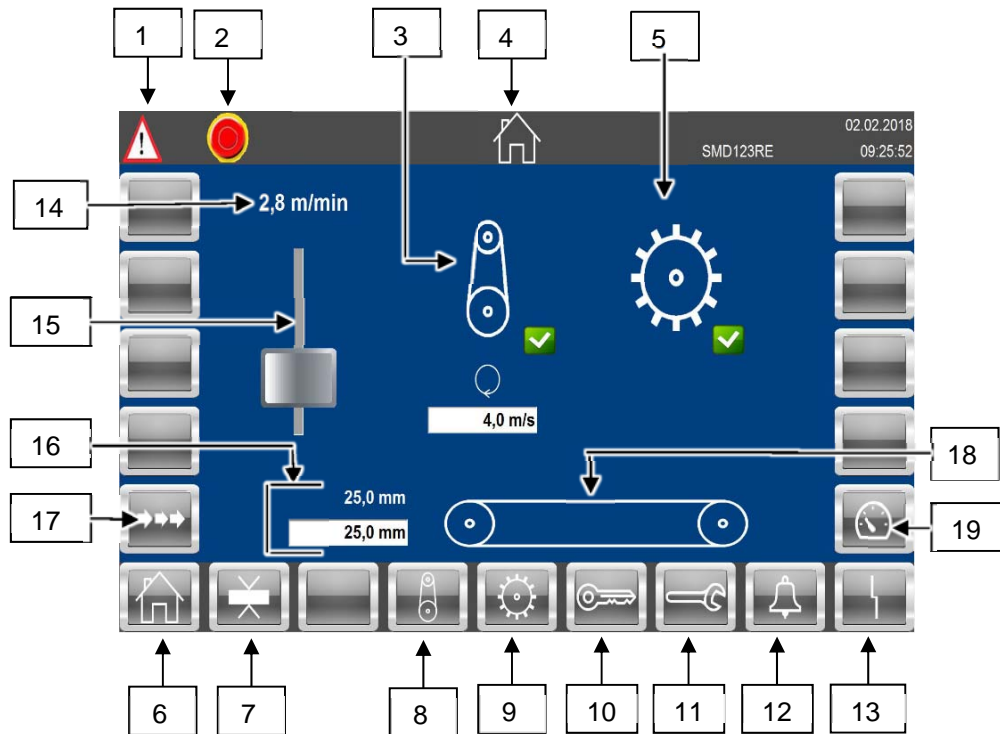


Abb. 13: Screen symbols

Item	Function	Item	Function
1	"Fault" symbol	11	"Service" button. Pressing displays the screen with the service information.
2	"EMERGENCY STOP is activated" symbol	12	"Error messages" button. Pressing displays the screen with the error messages.
3	R-device representation	13	Acknowledge error
4	Symbol for selected screen (in the example: Start screen)	14	Display of current feed speed
5	E-device representation	15	Slider feed speed
6	"Home" button. Pressing displays the start screen.	16	Sheet metal thickness display
7	"Sheet metal thickness" button. Pressing displays the screen of the sheet metal thickness.	17	The symbols of the function buttons are different depending on the screen. Symbols are described in the corresponding section. Shown here: Running direction of the conveyor belt.
8	"R-device" button. Pressing displays the screen of the R-device.	18	Feed display
9	"E-device" button. Pressing displays the screen of the E-device.	19	Power input of R-Head
10	Password level button. For machine set-up man and service personnel of manufacturer.		

## 5.2.3 Setting the sheet thickness

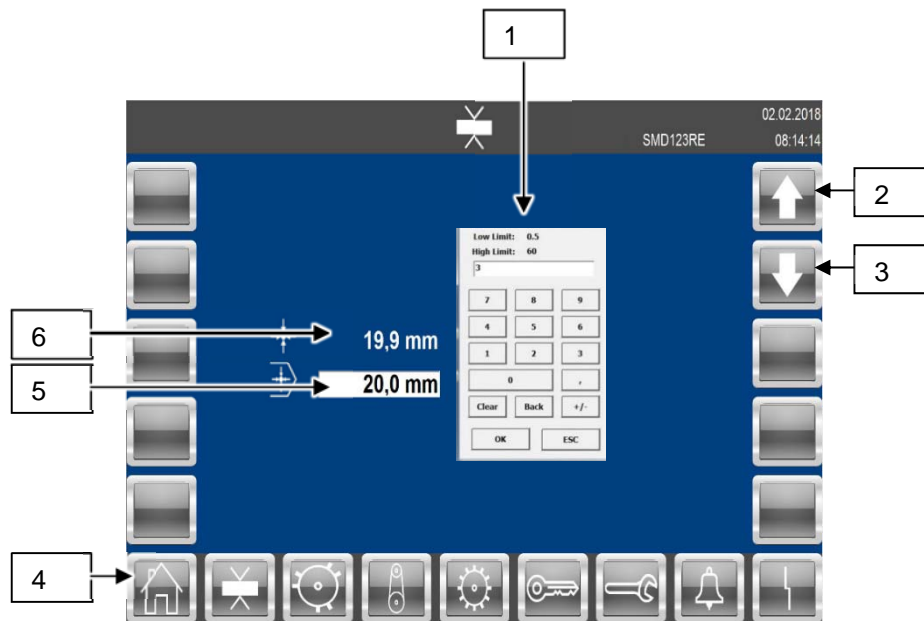


Abb. 14: Sheet metal thickness screen

Actual value (6) and target value (5) of the sheet metal thickness are displayed on the main screen.

Actual value = current position of the tool

Target value = desired position of the tool

**WARNING****Thrown out workpieces**

Injuries due to thrown out workpieces.

- During processing do not adjust the height.

**NOTE****Workpieces remaining in the machine**

Damage to the machine

- Ensure that no workpieces remain in the machine.

- Press the "sheet metal thickness" button (4).
  - ↳ The sheet metal thickness screen appears.
- Measure the sheet thickness of the work piece to be processed.
- Press "Target value" (5) display field.
  - ↳ The input field (1) appears.
- Enter the measured sheet metal thickness using the keyboard and confirm.



The function buttons (2) and (3) can be used in jog mode for free movement.

- For thicker sheet metal: Press function button (2).  
↳ Height adjustment moves upward.
- For thinner sheet metal: Press function button (3).  
↳ Height adjustment moves downwards.

#### 5.2.4 Selecting/deselecting R-device

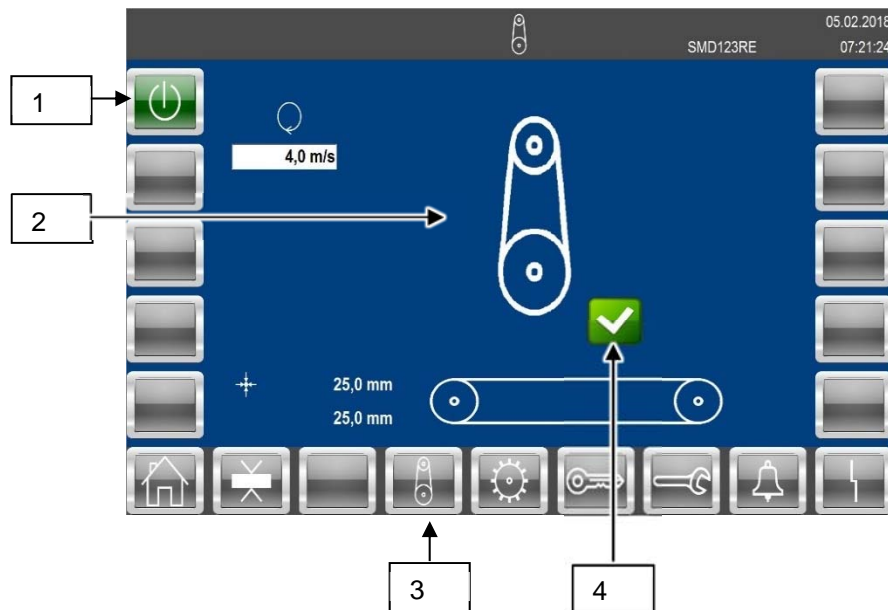


Abb. 15: R-device screen

Selecting deselected R-device:

- Press the "R-device" button (3).  
↳ The R-device screen appears.
- Press function button (1).  
↳ The symbol for the R-device (2) lights up white and a check mark is shown in the checkbox (4).

Deselecting selected R-device:

- Press the "R-device" button (3).  
↳ The R-device screen appears.
- Press function button (1).  
↳ The symbol for the R-device (2) lights up grey and an "x" is shown in the checkbox.

## 5.2.5 Adjusting the cutting speed

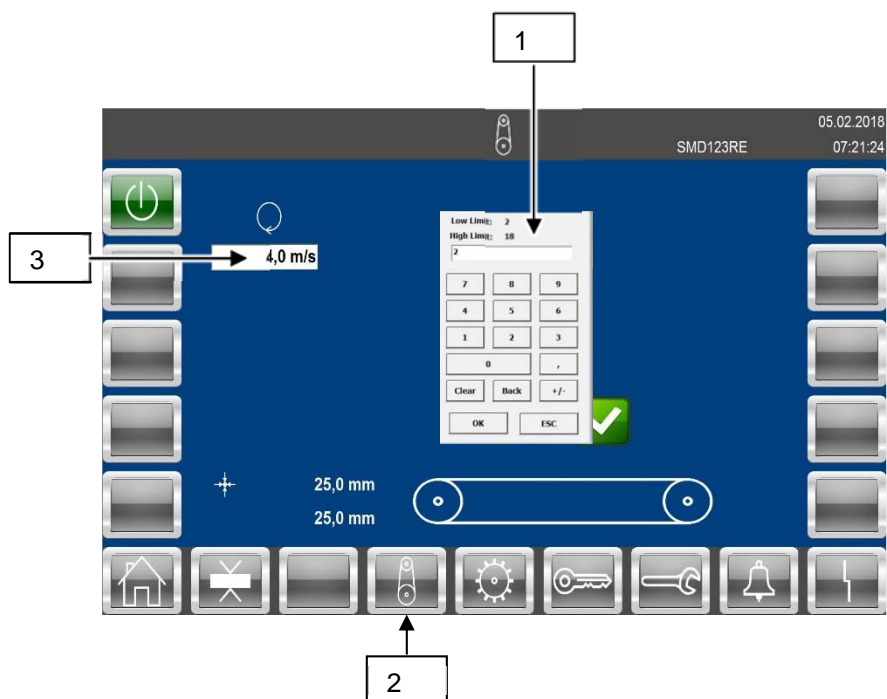


Abb. 16: Adjusting the cutting speed

- Press the "R-device" button (2).  
↳ The R-device screen appears.
- Press on the display field (3) of the cutting speed.  
↳ Input field (1) appears.
- Enter the desired cutting speed using the keyboard and confirm.



The feed speed can be set in a range from 2 to 18 m/s.



## 5.2.6 Power input R-Head



Abb. 17: Power input R-Head

When the R-Head is selected:

- Press push-button "Power input R-Head" (1).
- ↳ Readout of power input of R-Head (2) appears.

If the readout of the power input is in the yellow / red range, the positioning of the R-Head has to be reduced.

## 5.2.7 Selecting/deselecting E-device

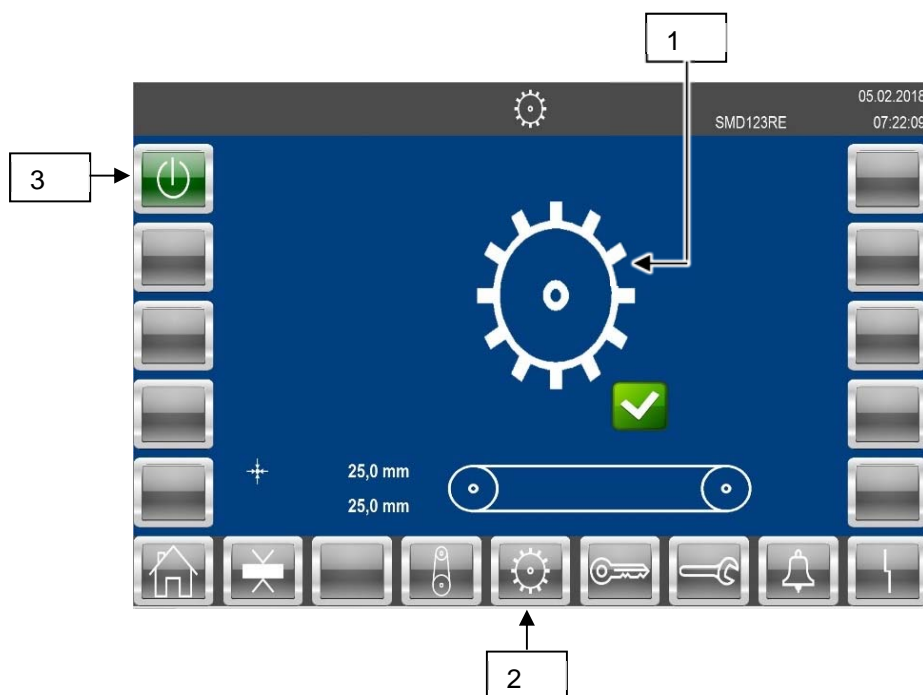


Abb. 18: E-device screen

Selecting the deselected E-device:

- Press the "E-device" button (2).
  - ↳ The E-device screen appears.
- Press function button (3).
  - ↳ The symbol for the E-device (1) lights up white and a check mark is shown in the checkbox.

Deselecting the selected E-device:

- Press the "E-device" button (2).
  - ↳ The E-device screen appears.
- Press function button (3).
  - ↳ The symbol for the E-device (1) lights up grey and an "x" is shown in the checkbox.

## 5.2.8 Calling up password level screen

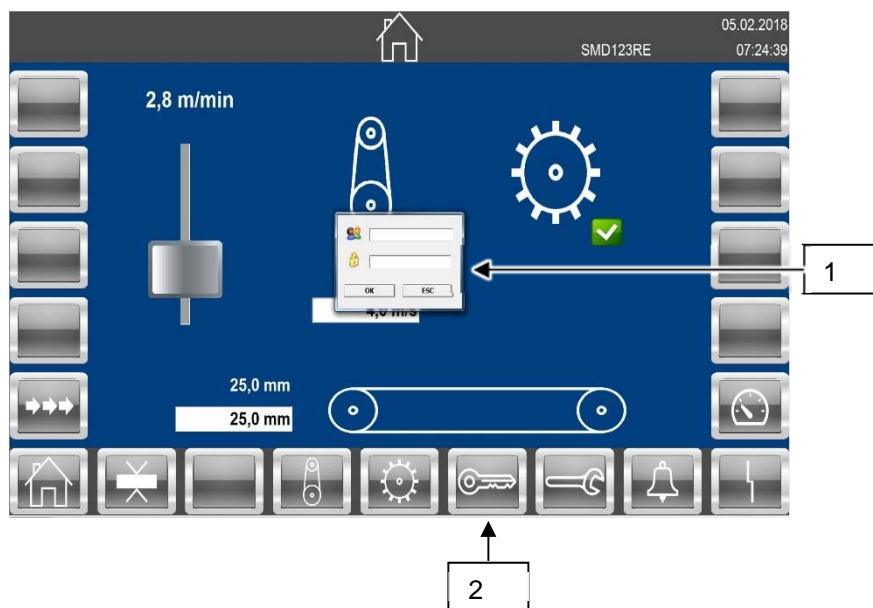


Abb. 19: Password protected area screen

- Press the "Password level" button (2).
- ↳ The input field (1) for entering user name and password appears.



The password level is reserved for the service technicians of the manufacturer.

### 5.2.9 Calling up service pages

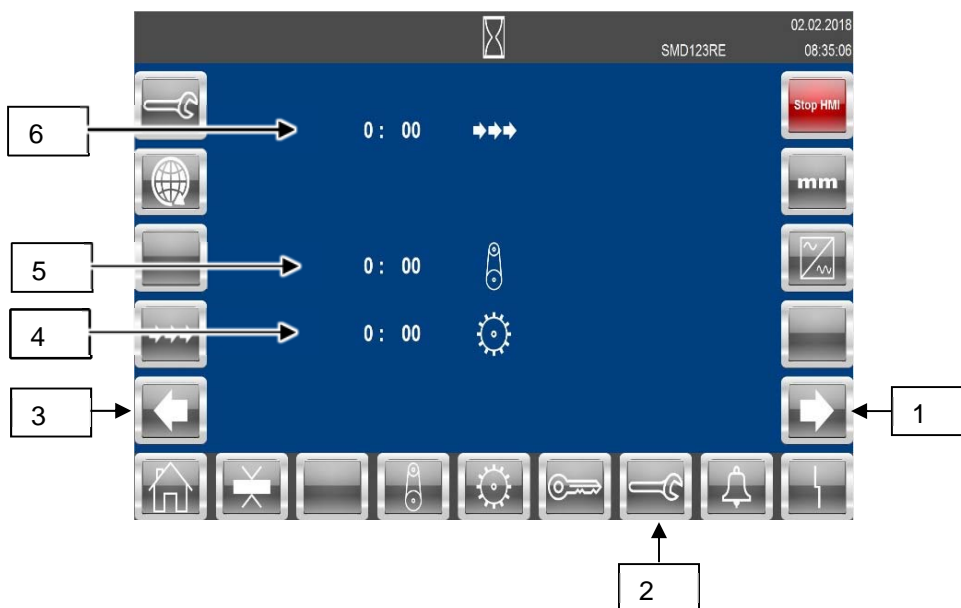


Abb. 20: Service screen, operating hours counter page

The service screen consists of three pages. The pages can be paged through using the arrow buttons (1) and (3).

- Press the "Service" button (2).
- ↳ The first page of the service screen appears.

The following information is displayed on the first page of the service screen:

- R-device operating hours (4)
- E-device operating hours (5)
- Feed operating hours (6)

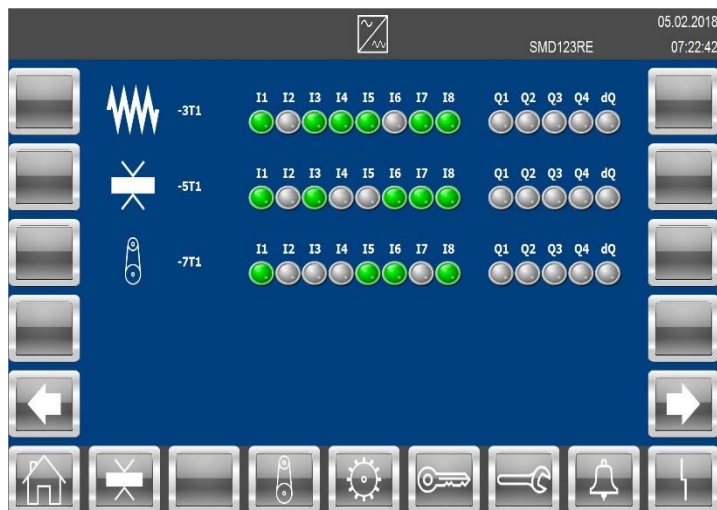


Abb. 21: Service screen, frequency converter page

The input/output signals for the frequency converter for the feed is displayed on the second page of the service screen. If there is a signal applied to a frequency converter, the corresponding dot symbol is shown in green.

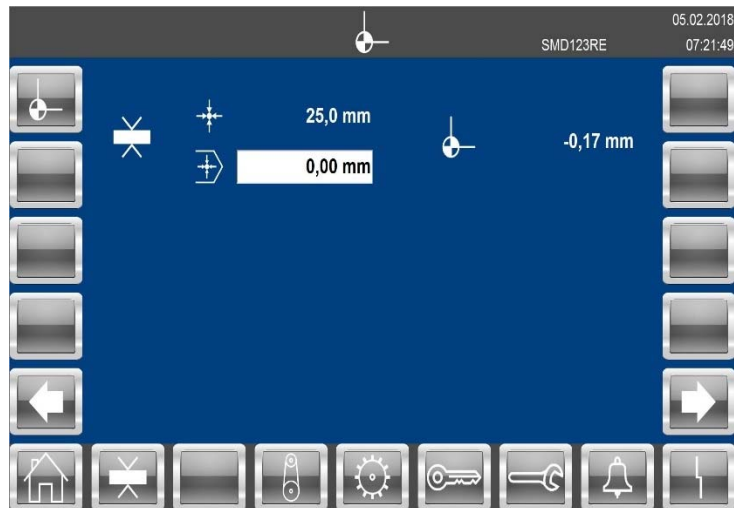


Abb. 22: Service screen, calibration page

The current calibration is displayed on the third page of the service screen. The display is for information only. Adjustment values cannot be changed by the user.

### 5.2.10 Calling up error messages

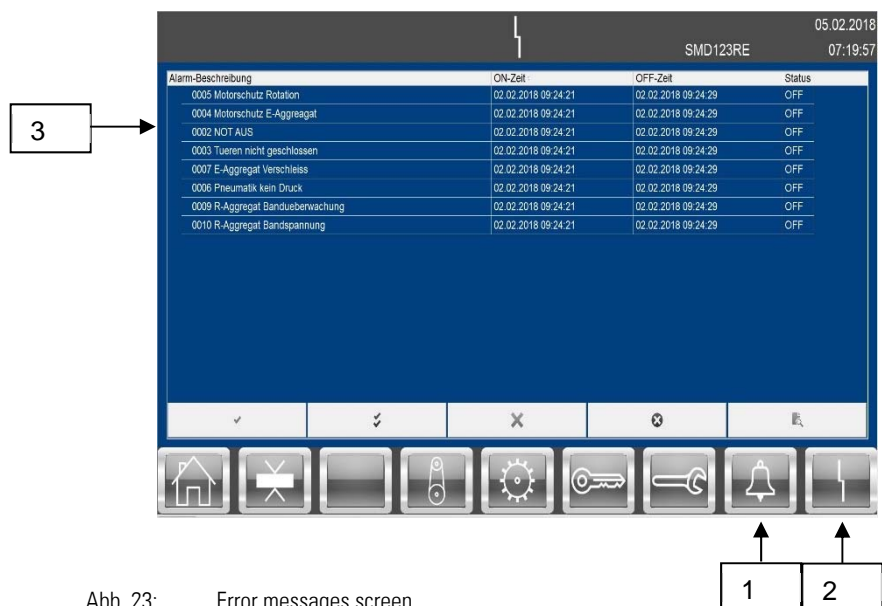


Abb. 23: Error messages screen

- Press the "Error message" button (1).



All current faults or error messages are shown in the Table (3) in bold font. The status of an active message is "ON".

- Remedy fault/error.
- Press button (2) to acknowledge the error message.



If a fault or error is remedied, the message text in the table (3) is shown in normal font. The status of an inactive message is "OFF".

## 5.2.11 Setting the feed speed

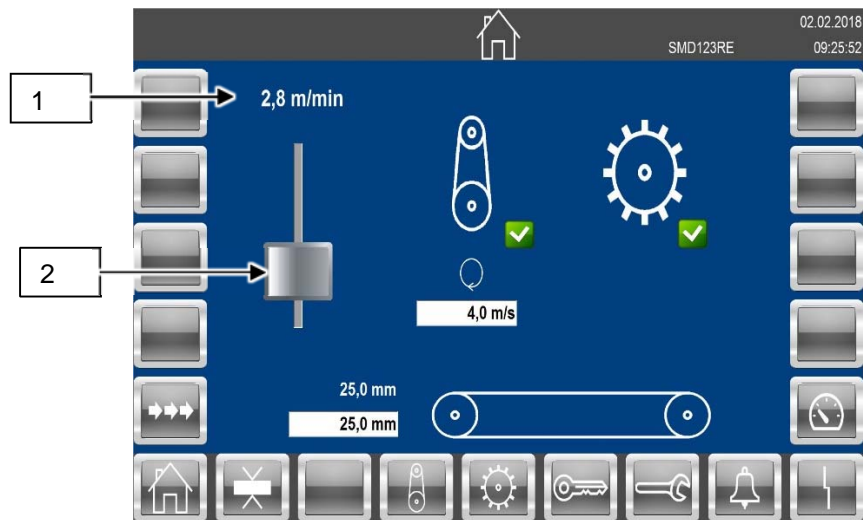


Abb. 24: Setting the feed speed

The feed speed of the conveyor belt is set via the slider (2).



For the optimum grinding result the feed speed must be adjusted according to the work piece. The feed speed can be set from 0.5 to 8 m/s.

- Push the slider upwards or downwards.
  - ↳ The selected feed speed (1) is displayed on the main screen.



## 5.3 Turning on the machine

- Remove contamination such as material residue and dust deposits.
- Make sure that the grinding belt and grinding mops are free of damage (visual inspection).
- Make sure that all "EMERGENCY STOP" buttons are unlocked.
- Place the main switch on the back of the machine into the "I" position.
  - ↳ The machine is switched on.



## 5.4 Putting the machine into operation



 **WARNING**
**Explosion hazard**

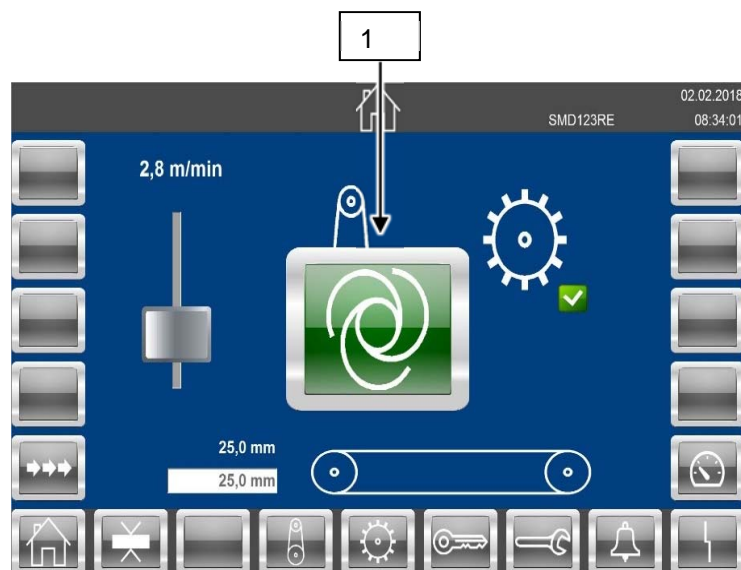
- If after the grinding of aluminium or aluminium alloyed sparking materials (e.g. stainless steel) should be machined, first clean the machine, the exhaust channels and the exhaust ducts of dust residues.
- When grinding aluminium or aluminium alloys connect an exhaust system with wet separator to the machine.

- Turn on machine (see section 5.3).
- Make sure that all malfunctions are corrected (see section 5.2.10).
- Select the required devices for the machining (see Sections 5.2.4 and 5.2.7).
- If the R-device is used: Set cutting speed (see Section 5.2.5).
- Set feed speed (see Section 5.2.11).
- Press the "Start" button.
  - ↳ The symbol  appears on the main screen in yellow and the devices move to the selected position. When the machine is set the  symbol is shown in green.



If all devices are already in work position (e.g. after a pause) and the "Start" button is pressed for the first time, then the  symbol appears immediately in green. The machine can then be started immediately by pressing on the  symbol.

- Wait until the  symbol is shown in green.
- Press the  (1) symbol.
  - ↳ The machine runs.



## 5.5 Processing material

### NOTE

#### **Minimum dimensions of the workpiece**

Damage to the machine and/or the workpiece

- The minimum dimensions of a workpiece are 150 x 80 x 1.0 mm.
- It must be ensured with short workpieces that the passage length is at least 150 mm.  
Place short workpieces parallel to the conveyor belt if necessary.

- 
- Acceptance of the workpieces at the output side of the machine is ensured.
  - Place workpiece onto the conveyor belt.



## 5.6 Change grinding belt

**WARNING****Accidental starting of the grinding motors during replacement of the grinding belt**

Severe injuries due to rotating grinding belt

- Turn off the main switch.
- Only have the grinding belt replaced by authorised persons.

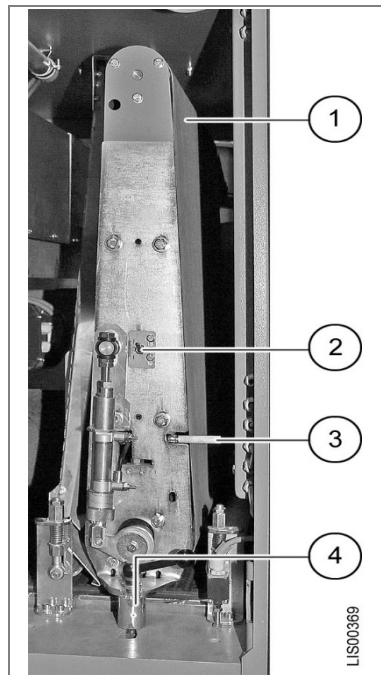


Abb. 25: Change grinding belt

- 1 Grinding belt
- 2 Tensioning drum switch
- 3 Belt running switch
- 4 Device support

- Switch off machine (see Section 5.10).
- Open left machine door.
- Swing the belt running switch (3) in the direction of the door until it stops
- Release tension on grinding belt. To do this set the tensioning drum switch (2) to the "0" position.
- Remove the device support (4).
- Pull off the grinding belt (1) from the R-device.
- Push a new grinding belt (1) on the R-device, paying attention to the correct running direction.
- Install the device support (4).
- Tension the grinding belt. To do this set the tensioning drum switch (2) upward to the "1" position.
- Swing the belt running switch (3) in the direction of the machine room until it stops
- Set the grinding belt height (see Section 5.10).

## 5.7 Setting the grinding belt height

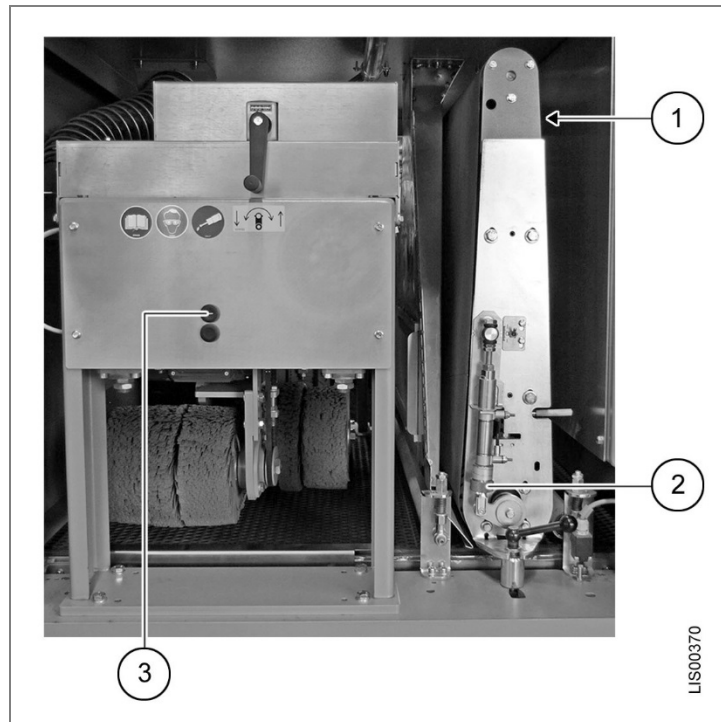





Abb. 26: Setting the grinding belt height

- 1 Grinding belt
- 2 Knurled nut
- 3 Feed button



After replacing the grinding belt the grinding belt height must be adjusted. To do this a flat steel must be placed under the R-device.

- If the grinding motors are in operation: Press the "Stop" button and wait until the grinding machine comes to a standstill.
- Measure thickness of the flat steel and enter it on the touchscreen (see Section 5.2.3).
- Press the "Start" button.
  - ↪ The symbol  appears on the main screen in yellow and the devices move to the selected position. When the machine is set the  symbol is shown in green.
- Wait until the  symbol is shown in green.
- Open left machine door.
- Place the flat steel in the centre of the conveyor belt.
- Transport the flat steel under the R-device. To do this press the feed (3) button.
- Check the setting of the grinding belt height. To do this, turn the grinding belt (1) manually.



The grinding belt height is correctly set if scratching of the grinding belt on the flat steel can be heard or seen.

- If necessary, correct the grinding belt height. To do this, turn the knurled nut (2).

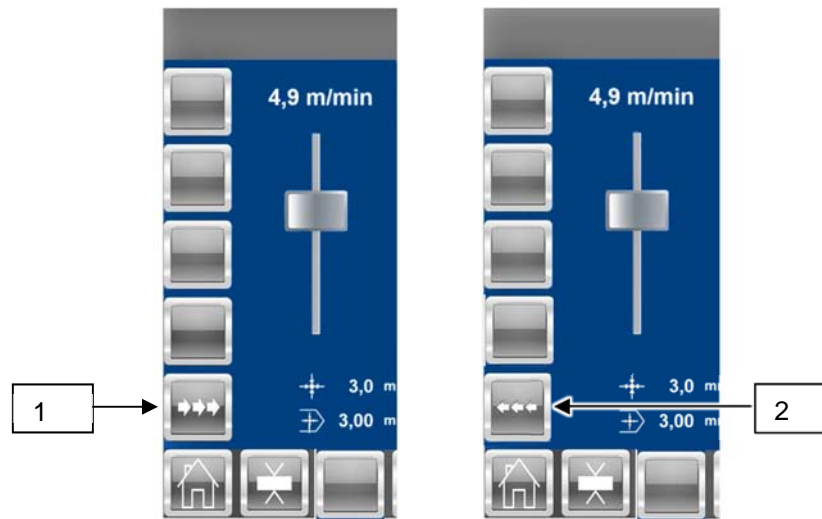


Abb. 27: Adjusting the conveying direction

- 1 Conveying into the machine
- 2 Conveying out of the machine



The conveying direction can be adjusted by pressing the function button (1 or 2). When the machine door is closed the conveying direction is automatically correctly set.

- Transport the flat steel out of the machine. To do this press the feed button.
- Close left machine door.

## 5.8 Replacing the grinding mops

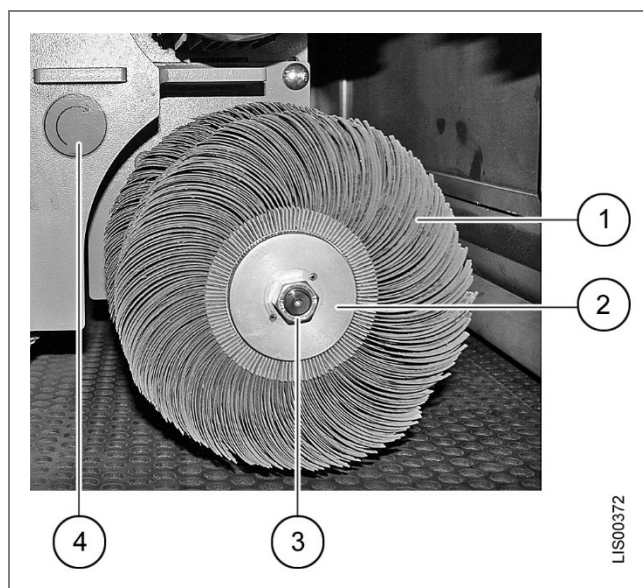


Abb. 28: Replacing the grinding mops

- 1 Grinding mop
- 2 Disk
- 3 nut
- 4 Direction of rotation sign



The grinding mops on the left and on the right side of the machine are replaced in the same manner. In the following the work steps for the left side are described.

- Switch off machine (see Section 5.6).
- Open left machine door.

## NOTE

The nut has a left-hand or right-hand thread, depending on the direction of rotation of the grinding mop. Nuts with a left-hand thread are marked with an arrow.

- Pay attention to the direction of rotation of the grinding mop.
- Unscrew nut (3).
- Remove the grinding mop (1) with washer (2) from the shaft.
- Slide a new grinding mop (1) with washer (2) on the shaft while observing the direction of rotation according to the sign (4).
- Screw the nut (3) on the shaft and tighten with the specified tightening torque (see Section 7.3).
- Set the grinding mop height (see Section 5.9).

### 5.9 Adjust the grinding mop height

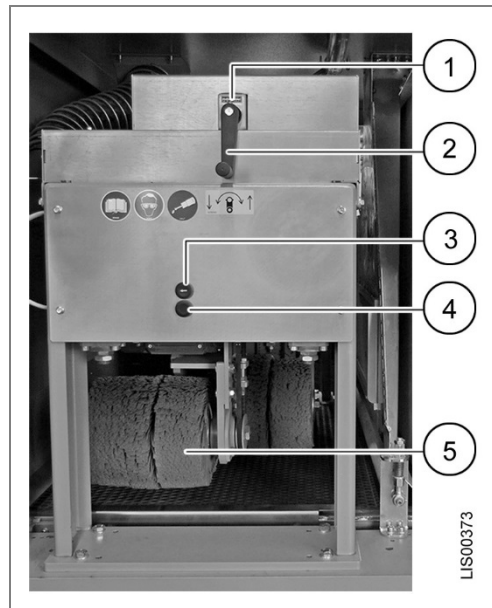





Abb. 29: Adjust the grinding mop height.

- 1 Display of wear of the grinding mop
- 2 Height adjustment crank
- 3 Feed button
- 4 E-device motor button
- 5 Grinding mop



The grinding mop height must be adjusted after a grinding mop change or with advanced wear. To do this a flat steel must be placed under the E-device.

- If the grinding motors are in operation: Press the "Stop" button and wait until the grinding machine comes to a standstill.
- Measure thickness of the flat steel and enter it on the touchscreen (see Section 5.2.3).
- Press the "Start" button.
  - ↪ The symbol  appears on the main screen in yellow and the devices move to the selected position. When the machine is set the  symbol is shown in green.
- Wait until the  symbol is shown in green.
- Open the left, and if necessary the right, machine door.
- Place the flat steel in the centre of the conveyor belt.
- Transport the flat steel under the E-device. To do this press the feed (3) button.
- Check the setting of the grinding mop height. To do this start the grinding mop (5) with E-device motor button (4).



The grinding mop height is correctly set if scratching of the grinding mop on the flat steel can be heard or seen.

- If necessary, correct the grinding mop height. To do this, turn the height adjustment crank (1).

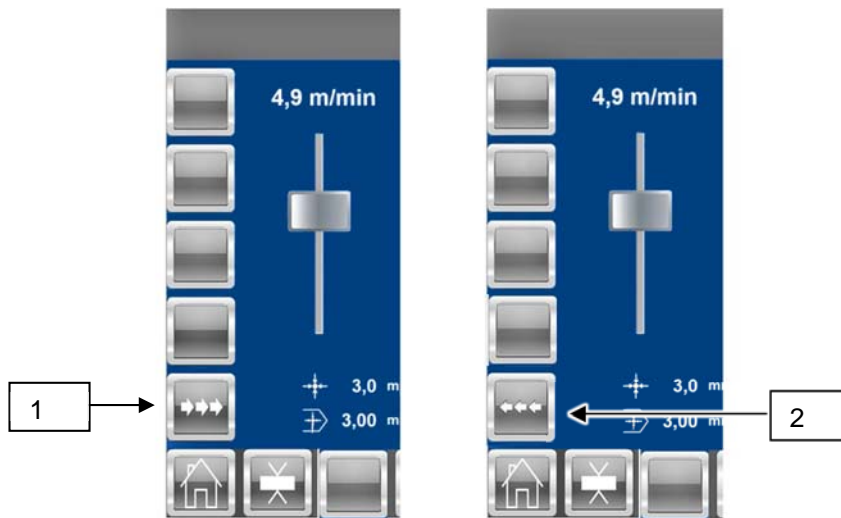


Abb. 30: Adjusting the conveying direction

- 1 Conveying into the machine
- 2 Conveying out of the machine



The conveying direction can be adjusted by pressing the function button (1 or 2). When the machine door is closed the conveying direction is automatically correctly set.

- Transport the flat steel out of the machine. To do this press the feed button.
- Close the left and, if open, the right machine door.

### 5.10 Turning off the machine

- Ensure that no more workpieces are in the machine.
- Press the "Stop" button.
- Place the main switch on the back of the machine into the "0" position.
  - ↻ The machine is switched off.

### 6 "Warm up" for the SMD 123 RE

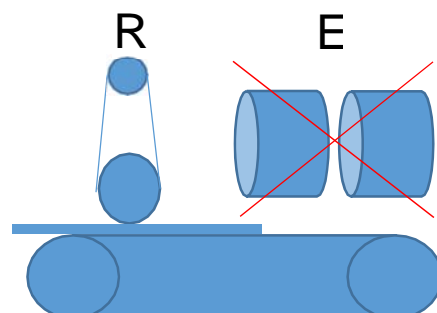
Dressing grinding belt R-aggregate	approx. 0,5h
Dressing E-aggregate	approx. 3,0h
Cleaning and raising traction of conveyor belt	approx. 0,5h
Checking the traction/adhesion of conveyor belt	approx. 0,5h
Correct adjustment of aggregates	approx. 0,5h

#### 6.1 Dressing grinding belt R-aggregate

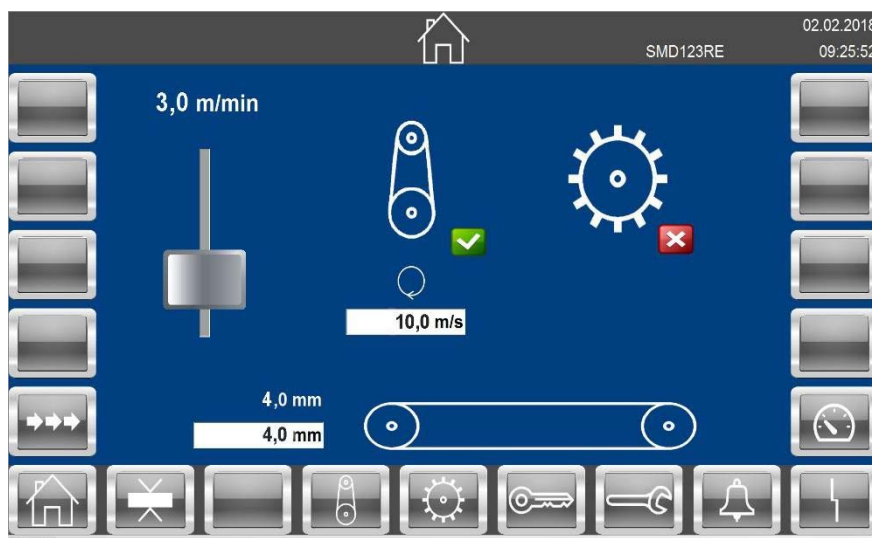
- Supply dressing sheet (preferably stainless)



- Adjust sheet thickness to the thickness of the dressing sheet
- Activate R-aggregate, deactivate E-aggregat
- Move dressing sheet into machine (using „service-mode“)
- Adjust pressure of grinding belt by doing the "scratchtest" (grinding belt must touch the sheet with normal pressure but belt must be able to by hand)



- Take dressing sheet out of machine (using „service-mode“)
- Leave „service-mode“. Set cutting speed to 10 m/s. Set feeding speed to 3 m/min.



- Start machine and process the dressing sheet with R-aggregate.
- Watch the ammeter. During the grinding procedure, the ammeter should reach the yellow rage (appr. 24A). Possibly you have to adjust the brass-nut at the Runit to give more or less pressure.



- Run the dressing sheet at least 5 times trough the machine to eliminate the „sharp grit spikes“. Maybe you have to readjust the pressure between the grinding passages. (watch ammeter -> approx. 24A)

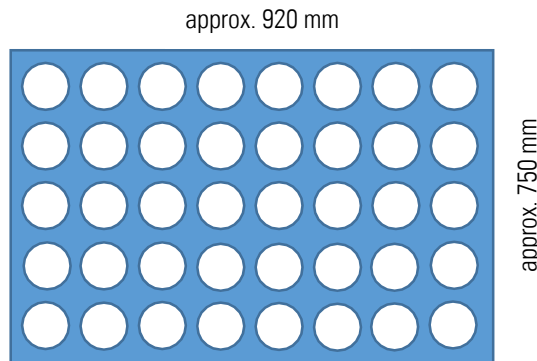
After this procedure the grinding belt is dressed equally. The sharp grit spikes are removed and the grinding belt creates less dust and dirt compared to a new one. Thereby you will have more friction between conveyor belt and workpiece. Also the „aggressive sharpness“ is eliminated and you can start production with same and more equal grinding result.



## 6.2 Dressing E-aggregate

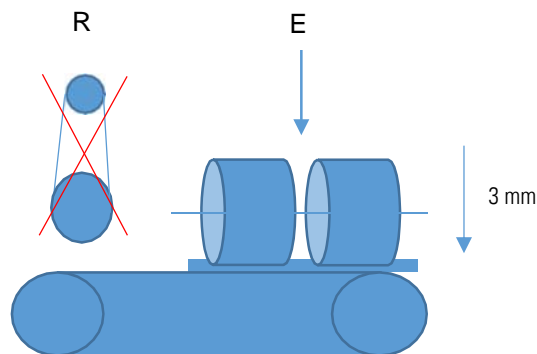
- Supply dressing sheet with a lot of contours (preferably stainless)

sheet thickness ca. 4 – 8



Dressing sheet SMD 123 RE LISSMAC 1055737

- Adjust sheet thickness to the thickness of the dressing sheet
- Activate E-aggregate, deactivate R-aggregate
- Move dressing sheet into machine (using „service-mode“)
- Set E-aggregate to 3 mm pressure by turning the crank handle. The lamella brushes must set into the dressing sheet about 3 mm.



- Take dressing sheet out of machine (using „service-mode“)
- Leave service-mode. Set feeding speed to 0,5m/min
- Start machine and process the dressing sheet permanently for 3h! The lamellas of the brushes will get softer and more flexible. Also the „sharp grit spikes“ will be eliminated.

This process must be carried out in order to be able to process small parts right from the start. Otherwise it will be tricky to process small parts from the beginning. Following pictures will show the difference between „new“ and „dressed“ E-Tools:

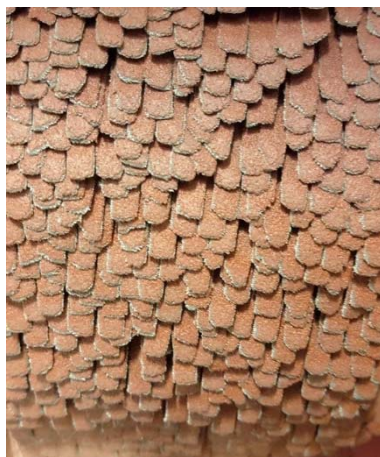
### New E-tools



-Processing small pieces could be tricky.

-The conveyor belt become rough while the tools are in contact with the conveyor belt. It is not possible to get a „sticky“ conveyor belt.

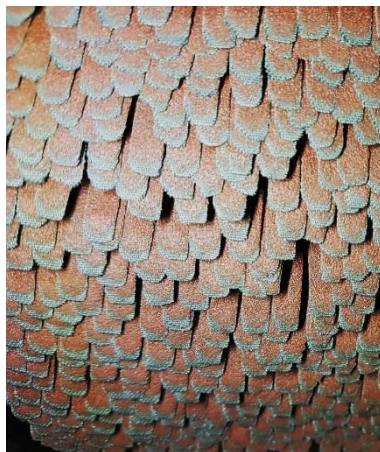
### „Dressed“ E-tools



-The tips of the lamellas are rounded well

-The lamellas aren't that aggressiv anymore and the conveyor belt will become more „smooth“ and „sticky“

### „Well dressed“ E-tools



-The tips of the lamellas are rounded well and we can see the fabric of lamella (fingernail)

-The conveyor belt will achieve best adhesion

### 6.3 Rasing „traction“ of conveyor belt

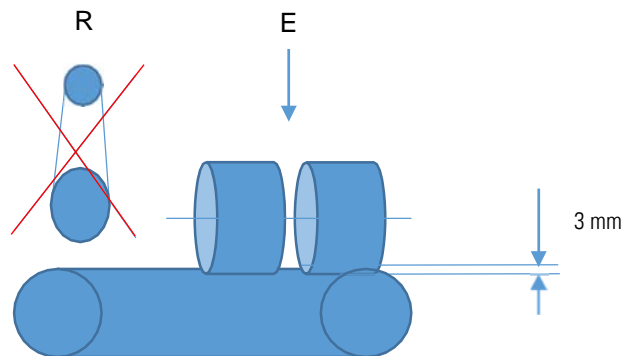
Some greasy remainings on the conveyor belt can be removed with a towel moistened with acetone, additional cleaning during process should be done with the mixture of Eurosol 99 (3%) and water (97%)

- Deactivate R-aggregate, activate E-aggregate!!



- Set sheet thickness to 1mm
- Set E-aggregate to 3mm pressure by turning the crank handle. The lamella brushes must dip into the conveyor belt about 3mm.
- Set feeding speed to 2m/min and run the machine without material for appr. 0,5h

The lamella brushes of the E-aggregate are now in touch with the conveyor belt and will clean it. At the same time the conveyor belt will raising up the traction and small parts will have more grip on the conveyor belt.



These procedure should be done by regular time intervals to keep the conveyor belt clean. At same time the conveyor belt should be cleaned with the delivered spray bottle.  
-> mixture: 97% water 3% Eurosol 99.

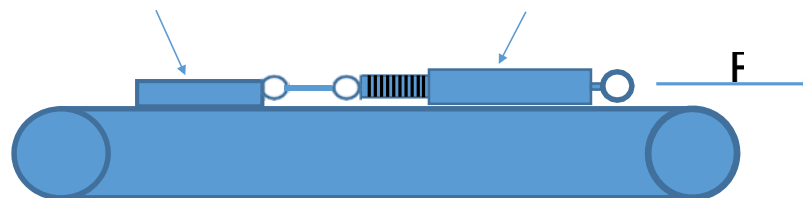
## 6.4 Checking traction/adhesion of conveyor belt

The conveyor belt can be checked for grip / adhesion using the following methodology.

### Required equipment:

- Flat steel 80mm x 70mm x 8mm with drawbar
- Zugwaage/Kraftmesser 0-50N bzw. 0-5kg

Test specimen flat steel 80mmx70mmx8mm      Weighbridge 0-50N / 0-5kg



### Methodic:

- Cleaning conveyor belt if necessary
- Placing the flat steel on the clean conveyor
- Hooking in the force gauge and pulling slowly in horizontally direction
- With new conveyor belt you should achieve min. 40N or 4 kg before flat steel begins to slide.
- With used conveyor belts you should achieve min. 25N or 2,5 kg

## 6.5 Correct adjustment of aggregates

Adjust R-aggregate always by doing the „scratchtest“. The grinding belt must be touching the workpiece but must be able to turn by hand. The pressure or rather the depth must be adjusted by turning the brass nut. For doing the scratchtest the R- aggregate must be activated so that the R-aggregate comes down from parking position into working position.

**Indications of too much grinding pressure:** The ammeter reaches the red range. The workpiece will get hot, in worst case it will burn into the conveyor belt.

**Remedy:** reduce grinding pressure, reduce cutting speed (m/s), raise up feeding speed (m/min).

**Workpieces are hurled around by the E-aggregate.** The following measures are to be taken: The conveyor belt must be cleaned. (wether by using the cleaner or by the E-aggregate itselfs like described in capture 3, „raising traction of conveyor belt“). Reduce the depth of the E-aggregate by cranking up with the crank handle until the workpiece will not hurled around anymore. If now the edgerounding is too less, the only way is to slow down feeding speed. But there are physically limits anyway. Hereby it could be possible that some workpiece cannot be processed safe.

### Some characteristics for impossible process:

- Bended parts
- Parts are oily or covered with grease
- Parts have big thickness compared to surface area. Looks more like a cube than a plate.
- Parts have burr on both sides so they can not lay flat on the conveyor belt.

## 7 Service

### 7.1 Service intervals



Perform the following service work regularly in the specified intervals.  
The intervals are shortened corresponding to multiple-shift operation.

<b>Service work</b>	<b>Interval</b>
Clean the interior of the machine (see Section 7.4)	daily/once per shift every 8 hrs.
Lubricate the lubrication nipples of the guide blocks (see Section 7.6)	every 100 hrs.
Check drive belts for wear	weekly
Tension chains	every 1500 hrs.
Check V-belt tension	every 250 hrs.
Check service unit for compressed air (see Section 0)	daily/once per shift every 8 hrs.

### 7.2 Lubricant table / Conveyor Belt Cleaner

Lubricant / Cleaner	Designation
Grease	Multi-purpose grease(NLGI class EP 2)
Conveyor Belt Cleaner (included in scope of delivery)	<u>Mixing ratio:</u> 97% Water + 3% Eurosol 99



## DANGER

**Eurosol 99 Heavy chemical burns on the skin and heavy eye damages!**

**The cleansing material Eurosol 99 can lead to heavy chemical burns and heavy eye damages.**



- Do not breathe in!
- Do not drink!
- Avoid eye contact!
- Avoid contact with skin and clothing!
- Observe warning safety notes of the manufacturer!

#### **First Aid Measurements:**

**General Notes:** First aider: Pay attention to self protection! Bring and lay down persons concerned out of the danger zone.

**After breathing in: Arrange for fresh air.** Medical treatment is necessary.

**When swallowing:** Flush out the mouth. DO NOT induce vomiting.

**When in contact with skin or hair:** Immediately wash off with Polyethylenglykol, then wash off with a lot of water. All clothing contaminated are to taken off immediately. In case of skin irritation please consult or take medial aid.

**When in contact with eyes:** Carefully wash out with water for several minutes. Remove contact lenses if these are used. Continue to wash out.



### 7.3 Tightening torque for standard metric thread

All maximum permissible tightening torques listed here apply to threaded connections with ISO 4014 – 4018 hexagon head screws and ISO 4762 hexagon socket head screws, as well as screws with analogous head strength for a friction coefficient of  $\mu_{tot} = 0.12$ .

Hexagon head screws / hexagon socket head screws / hex nuts	Maximum tightening torque Maximum Ma in <b>Nm</b>		
	ISO 898/1 strength classes		
	8.8	10.9	12.9
M4	2.5	4	4.5
M5	5	7.5	9
M6	9	13	15
M7	14	20	25
M8	22	30	35
M10	45	65	75
M12	75	105	125
M14	115	170	200
M16	180	260	310
M18	260	370	430
M20	360	520	600
M22	490	700	820
M24	620	890	1040

## 7.4 Cleaning

The machine must be cleaned after every shift (at least once per day) and material residue must be removed.



### WARNING



#### Accidental starting of the grinding motors during cleaning

Severe injuries due to rotating grinding belts.

- Turn off the main switch.
- Only have the machine cleaned by authorised persons.

- Turn off the main switch.
- Open side doors.



### WARNING



#### Explosion hazard

Steel dust can react explosively.

- Make sure that grinding dust does not come in contact with ignition sources.

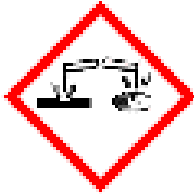
- Vacuum grinding dust and material residue from the machine interior, the exhaust duct and the exhaust piping with an industrial vacuum cleaner.
- Close the side doors.
- Dispose of grinding dust and material residue.



Grinding dust and material residue must be disposed of in accordance with applicable country-specific law.



## 7.5 Cleaning of Conveyor Belt

**DANGER**

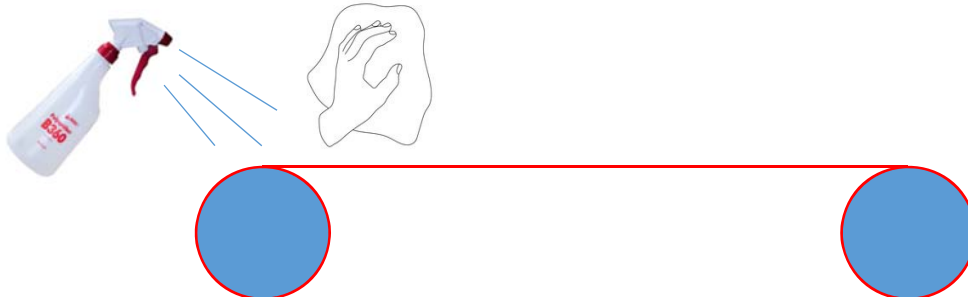
**Eurosol 99 Heavy chemical burns on the skin and heavy eye damages!**

**The cleansing material Eurosol 99 can lead to heavy chemical burns and heavy eye damages.**

- Do not breathe in!
- Do not drink!
- Avoid eye contact!
- Avoid contact with skin and clothing!
- Observe warning safety notes of the manufacturer!

If the adhesion of the parts is decreasing, the conveyor belt has to be cleaned by means of an aerosol (see 6.2 / 97%Water + 3% Eurosol) and to be cleaned with a cloth.

- Start machine and select low feed speed (approx. 1,0m/min).
- Spray the conveyor belt and rub dry with a cloth.



Shut-away product: Furnish this product and its container to problem disposal of waste.

### 7.6 Lubricating the guide blocks

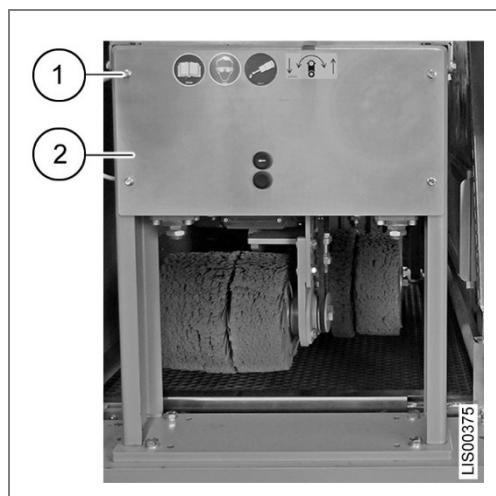


Abb. 31: Cover panel on the guide of the E-device

- 1 screw
- 2 Cover plate



The guide blocks on the left and on the right side of the machine are lubricated in the same manner. In the following the work steps for the left side are described.

- Open left machine door.
- Unscrew four screws (1).
- Remove the cover panel (2) from the E-device.

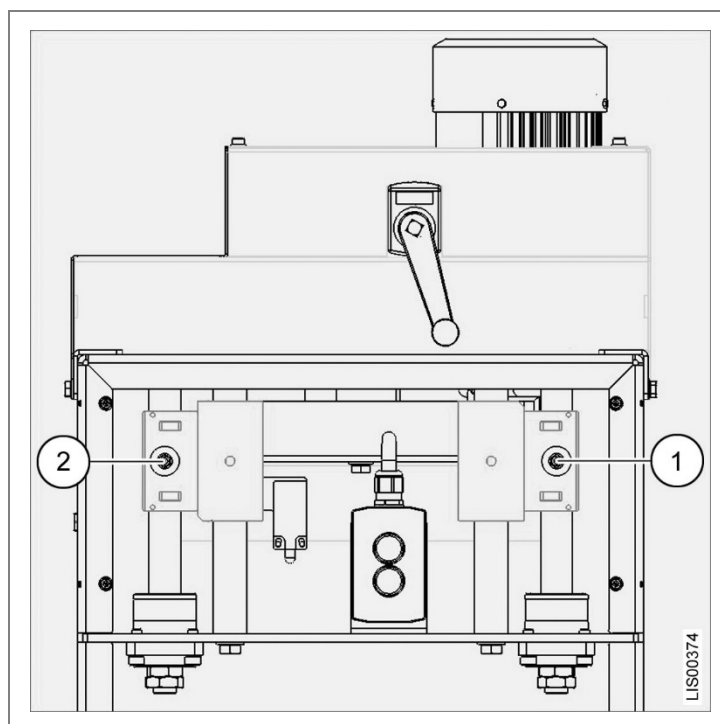


Abb. 32: Lubrication points on the guide block

- 1 Lubrication point, right

### 2 Left lubrication point

- Lubricate lubrication points (1) and (2).
- Fasten cover panel with four screws on the E-device. Tighten screws with specified tightening torque (see Section 7.3).
- Lubricate the lubrication points on the right side of the machine in the same manner.

## 7.7 Checking the service unit for compressed air

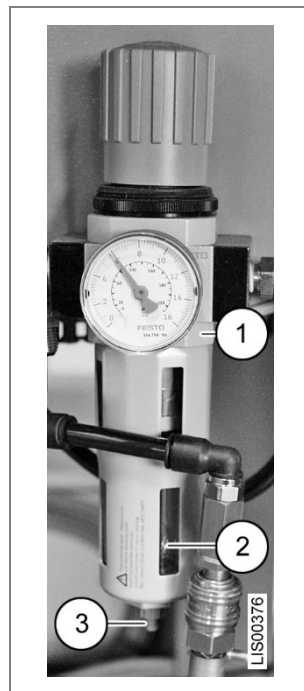


Abb. 33: Service unit

- 1 Service unit
- 2 View window
- 3 Valve

- Check in the view window (2) whether condensation has accumulated in the service unit (1).
- If necessary, open the valve (3) and drain condensate.

## 8 Troubleshooting

If the machine is not working or is not working correctly, the following malfunctions may pertain:

Error	Display/behaviour	Cause	Solution
1	Machine does not start	The "EMERGENCY STOP" button in front or rear is pressed	Unlock "EMERGENCY STOP" button
		Main switch is in position "0"	Set the main switch to the "1" position
		Left and/or right machine door is open	Close machine door(s)
		Door contact switch is faulty	Inform electrician
		Upper safety shut off bar triggered	Set correct sheet metal thickness (see Section 5.2.3)
		Sheet thickness protection triggered	Process workpieces with the correct material thickness
		Volume flow of the extraction system is not sufficient	Clean the extraction system and piping Suction power is too low
2	No display on control and display field	Main switch is in position "0"	Set the main switch to the "1" position. If the fault is not remedied: Inform electrician
3	R-Assembly does not run	R-device is deselected	Select R-device (see Section 5.2.4)
4	E-Assembly does not run	E-device is deselected	Select E-device (see Section 0)
5	Conveyor belt does not run	Switch bar on conveyor belt is actuated	Free switch bar
6	Grinding result insufficient	Grinding belt is worn	Replace grinding belt (see Section 5.6)
		Distance of the grinding mop is too large (due to wear)	Correct the grinding mop height (see Section 5.9)
		Cutting speed and/or feed is incorrectly set	Correct cutting speed and/or feed (see Section 0 and 5.2.11)

## 9 Customer service

If malfunctions occur which cannot be remedied by the customer themselves, contact the following customer service address:

LISSMAC  
Maschinenbau GmbH  
Lanzstraße 4  
D-88410 Bad Wurzach  
Telephone: +49 (0) 7564 / 307 - 0  
Fax: + 49 (0) 7564 / 307 - 500  
E-mail: [lissmac@lissmac.com](mailto:lissmac@lissmac.com)  
Web: [www.lissmac.com](http://www.lissmac.com)

## **10 Decommissioning and disposal**

If the machine should be dismantled after the end of its service life, it must be properly disassembled. The individual parts must be taken to recycling and disposal.

The following parts of the machine contain environmentally hazardous substances:

- Electronic components of the controls
  - Gears (lubricant)
- 
- Disconnect the machine from the power supply.
  - Disassemble the machine into individual parts and dispose of parts which contain environmentally hazardous substances according to the applicable national regulations.
  - Recycle the other machine parts according to their materials.

## 11 Warranty

The warranty for this machine is 12 months. For the following listed wear parts the warranty only applies if the wear is not caused by operation.

- Feed and drive elements, such as toothed racks, gears, pinions, spindles, spindle nuts, spindle bearing, cables, chains, chain wheels, belts
- Seals, cable, hoses, collars, connectors, couplings and switches for pneumatics, hydraulics, water, electrical, fuel
- Guide elements, such as guide strips, guide bushings, guide rails, rollers, bearings, anti-slide plating
- Tension elements from quick-coupling systems
- Plain and roller bearings, which do not run in oil bath
- Shaft sealing rings and sealing elements
- Friction and overload couplings, braking equipment
- Carbon brushes, collectors
- Easily dissolvable rings
- External potentiometer and manual switching elements
- Fuses and lamps
- Auxiliary and operating materials
- Fastening elements, such as pegs, anchors and screws
- Lamella
- Diaphragms
- Sealing brushes, sealing rubber, splash guard cloths
- All types of filters
- Drive and deflector rollers and bracings
- Running and drive wheels
- Transport belt
- Rubber scrapers
- Needle felt protection
- Energy storage
- Abrasive belts/grinding belts



Wear parts are parts that with intended use of the machine have limited operational wear. The wear time is not uniformly specified, it differs according to intensity of use. Wear parts must be serviced, adjusted, and replaced as needed corresponding to the specific device's operating manual provided by the manufacturer.

Wear caused by operation does not qualify for warranty claims.

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## 12 FOREWORD INSTALLATION DECLARATION



### **WARNING!**

- Carcinogenic substances which can cause damage to health may be released during grinding.
- It must be ensured that in case of failure or a reduction in the power of the extractor system, further work with the grinding machine is not possible.

Operation without the extractor system is not use according to the intended purpose. Liability of the manufacturer for damage due to operation without the extractor system is excluded.

All national requirements for the extractor system and the material which is to be extracted must be complied with. A dry dust extractor (e.g. DDE 3200) may be used as an extractor for machining steel and stainless steel. A wet dust extractor (e.g. WDE 3000) may be used as an extractor for machining aluminum or aluminum alloys. A wet dust extractor must also be used as an extractor for mixed operation with stainless steel and aluminum. For machining of non-ferrous metals other than steel or stainless steel, or non-ferrous light metals other than aluminum, or for mixed operation with such materials, the extractor solution must always be agreed with LISSMAC.



This declaration is based on the Machinery Directive 2006/42/EC Annex VII Part B:

## Declaration with respect to the incomplete machine

# LISSMAC

METAL PROCESSING

This declaration only relates to the machine in the state, in which it was brought into circulation; parts which are subsequently attached by the end user and / or subsequent modifications are not considered.

The machine may only be put into operation if the system complies with the relevant regulations of Directive 2006/42/EC. In addition, Directive 2014/30/EU was applied.

### Manufacturer:

LISSMAC Maschinenbau GmbH  
Niederlassung Beckum  
Stromberger Str. 139  
D-59269 Beckum

The technical documentation is archived by  
LISSMAC Maschinenbau GmbH, Lanzstraße 4, D-88410 Bad Wurzach.

### Description of the machine:

The LISSMAC SMD series grinding machine is used to round the edges of stamped, laser and fine plasma-cut workpieces and may only be operated in combination with an extractor which is approved according to the relevant EC Directive.

	SMD 123 RE
Voltage:	400V/50Hz / 480V/60Hz
Rated current:	41 A / 42 A
Rated power:	23 kW / 28,1 kW
Connection power:	28,5 kVA / 35 kVA
Protection class:	IP 42
Weight:	1750 kg
Year of manufacture:	2019

### Harmonized standards:

EN ISO 12100:2011-03  
EN 60204-1; VDE 0113-1:2007-06  
EN 60204-1/A1; VDE 0113-1/A1:2009-10

### Legally binding authorized representative:

LISSMAC Maschinenbau GmbH  
Lanzstraße 4  
88410 Bad Wurzach  
Tel.: +49 (0) 7564 / 307 - 0  
Mail: [lissmac@lissmac.com](mailto:lissmac@lissmac.com) / [www.lissmac.com](http://www.lissmac.com)

Bad Wurzach 3/22/2018



Klaus Kiefer  
(Manager)



on behalf Stefan Krummenauer  
(Product Manager)

