LISSMAC

METAL PROCESSING

OPERATING MANUAL
GRINDING MACHINE

SBM-XL 1000 G2S2-60
SBM-XL 1500 G2S2-60

EN

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Imprint

Operating manual for LISSMAC

Grinding machine SBM-XL 1000 G2S2-60
SBM-XL 1500 G2S2-60

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1 About this manual

1.1 Target group

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

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

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.

Along with the operating manual and the valid legal regulations for accident prevention in the country of use and the place of use, 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:

- Toshiba frequenzumformer VFS 11
- Documenation extraction 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, notes and important warnings are presented according to the following examples:

Important information is marked with a »i« in this operating manual.

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 sequentially by numbers in parentheses.

2 Safety

2.1 Safety instructions

The SBM-XL G2S2-60 Grinding machine is constructed with the latest technology and to recognised safety system regulations. 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, who are authorised to work on the machine, must have read and understood the operating manual and especially the Safety Instructions chapter 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.
- Use required or regulated personal protective clothing (e.g. work gloves, safety glasses).
- 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 specified or given in the operating manual.
- Ensure the availability of the shop equipment adequate for the maintenance and service work.

2.3 Personnel selection and qualifications

Only responsible and 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 may 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.
- 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.
- Even when moving the machine only for a short distance, disconnect the machine from the power mains!
- 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, floor load carrying capacity 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 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

- Have special work performed only by technicians authorised for it.
- 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 special and maintenance work. Name a surveillance person.
- If the machine is completely shut off during service and repair work, secure the machine against accidental start.
- When the machine is being cleaned of dust residue, always disconnect the machine and the exhaust system from the mains supply.
- Before cleaning the machine 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 in a safe and environmentally sound manner.

2.7 Safety instructions for special types of dangers

2.7.1 Electric power

- In case of problems with the electrical power supply, turn the machine off immediately.
- When changing fuses only use original fuses with specified amperage.
- Only electricians or trained personnel under the guidance and monitoring of an electrician perform work on electric equipment of the machine in accordance with electrical regulations.
- Regularly check the machine electrical equipment. Immediately correct deficiencies, such as loose connections or scorched cable.

2.7.2 Dust

- Only operate the machine with a functional exhaust system which meets requirements given in the technical data.
- Follow the instruction manual belonging to the exhaust system.
- If materials (e.g. stainless steel) are ground, where a carcinogenic substance is released, the exhaust system can only be operated with an absolute filter installed.

2.7.3 Fire hazard

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

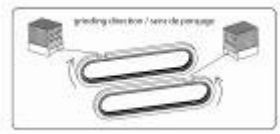
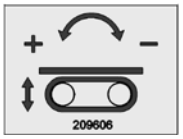
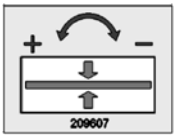
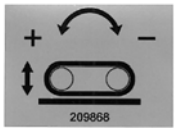
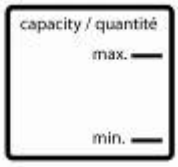
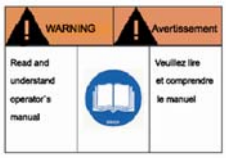
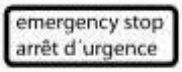
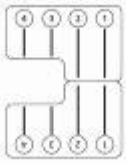
2.7.4 Explosion hazard

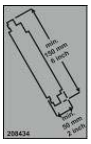
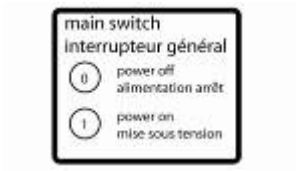
- Do not process aluminium or aluminium alloys on the machine. The machine has no explosion protection and is not approved for the processing of aluminium.
- Clean the dust collection container and the exhaust ducts of dust residue daily.

2.8 Explanation of warning symbols on the machine

The following symbols are located on the machine (see page 16 to 18) and warn of dangers coming from the machine:

Symbol no.	Symbol	Meaning
1		This symbol on the machine indicates that dust and splinter may be ejected from the machine during grinding. Wear safety glasses.
2		This symbol on the machine warns of rotating parts in the machine.
3		This symbol indicates the danger that hands could be injured. Wear protective gloves
5		This symbol on the control cabinet indicates dangerous electrical voltage.
6		This symbol indicates turning V-belt pulleys.
7		This symbol indicates high hydraulic pressure in the hoses and components.
8		Information about belt arrangement, top.

Symbol no.	Symbol	Meaning
9		Information about belt arrangement, bottom.
10		Warning!! Disconnect power before working within
20		Information about forklift transport.
11		Symbol, Hand wheel for moving bottom S-unit
12		Symbol, Hand wheel for adjusting sheet thickness.
13		Symbol, Hand wheel for moving top S-unit
14		This symbol on the hydraulic tank indicates the hydraulic oil level.
15		The symbol indicates that the operating manual must be observed.
16		This symbol indicates the EMERGENCY STOP button.
17		Information about the switch position of the gear box.

Symbol no.	Symbol	Meaning
18		Information about the switch position and functions of the gear box.
19		Lifting point for crane hooks
21		The symbol indicates the minimum length of the workpiece to be machined.
22		Symbol Grease gun, here lubrication nipple (see 7.3)
23		Symbol, Direction of rotation arrow
24		Information about the switch position of the main switch.

2.9 Symbols on the machine front side

The next few pages will illustrate the positions where symbols/warning labels are applied to the machine. The symbols/warning labels for each position number are shown on page 12/13/14.

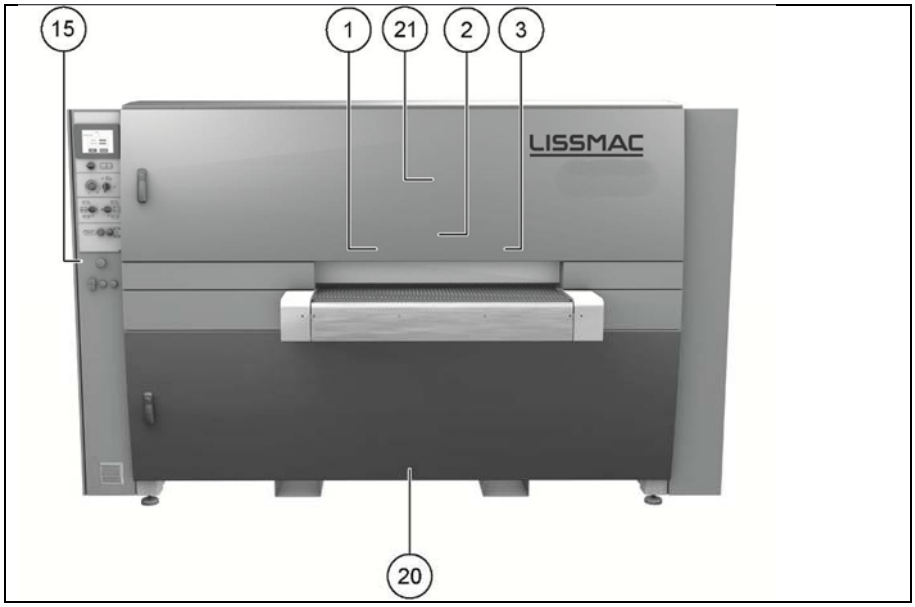


Abb. 1: Symbols on the machine front side

1 Symbol "Wear safety glasses"
2 Turning parts
3 Symbol "Wear gloves"
15 Symbol, Observe operating manual
20 Information about forklift transport
21 Symbol, Insert parts diagonally

Abb. 2: Symbols on the machine front side

19 Symbol, Crane hook

2.10 Symbols in the machine

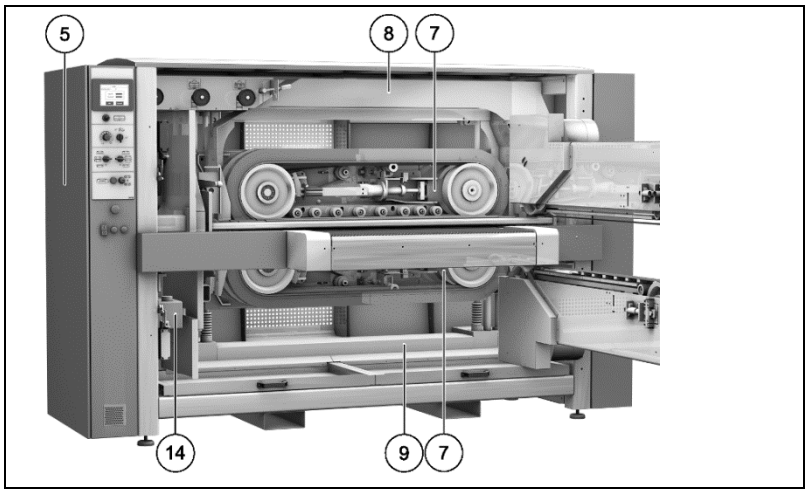


Abb. 3: Symbols in the machine

5 Symbol, Dangerous electrical voltage
7 Hydraulic pressure
8 Belt arrangement, top
9 Belt arrangement, bottom
14 Hydraulic oil level label

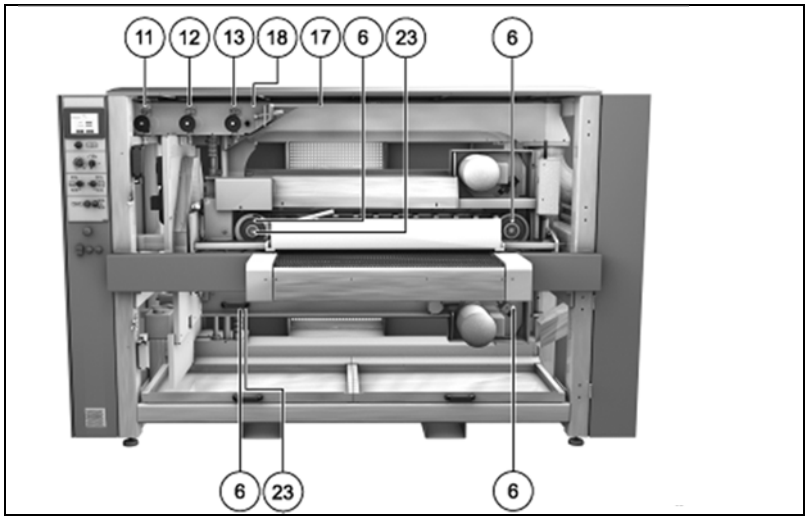


Abb. 4: Symbols in the machine

6 Symbol, Turning V-belt pulleys
11 Symbol, Hand wheel for moving bottom S-unit
12 Symbol, Hand wheel for adjusting sheet thickness.
13 Symbol, Hand wheel for moving top S-unit
17 Information about the switch position of the gear box
18 Information about the switch position and function of the gear box
23 Direction of rotation arrow

2.11 Symbols on the back of the machine

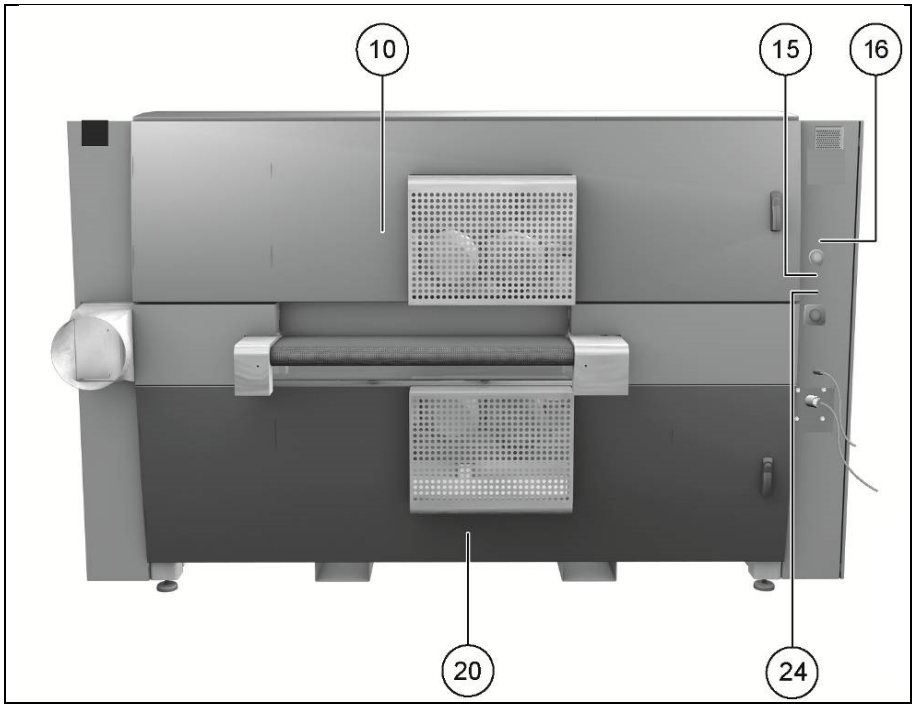


Abb. 5: Symbols on the back of the machine

10 Warning!! disconnect power before working within
15 Symbol, Observe operating manual
16 EMERGENCY STOP label
20 Information about forklift transport
24 Information about the switch position of the main switch

Notes:

3 Product description

3.1 Appropriate usage

The Grinding machine SBM-XL 1000+1500 G2S2-60 is intended exclusively for double sided deburring and rounding edges of steel and stainless steel sheets and following the information in this operating manual.

Non-intended use particularly includes grinding and deburring of other materials and alloys.

With two-sided processing, material thicknesses of 0.5 mm to 120 mm and a warpage of maximum 3 mm can be processed.

The machine may only be operated as a system with a dry dust extraction system that is provided and approved for it.

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

- Level reinforced floor of load carrying capacity (see installation plan layout)
- Temperature range from +10° to +40 °C
- Humidity 5 – 95 % (not condensing)

Use for any other purposes is non-intended use.

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

3.2 Structure

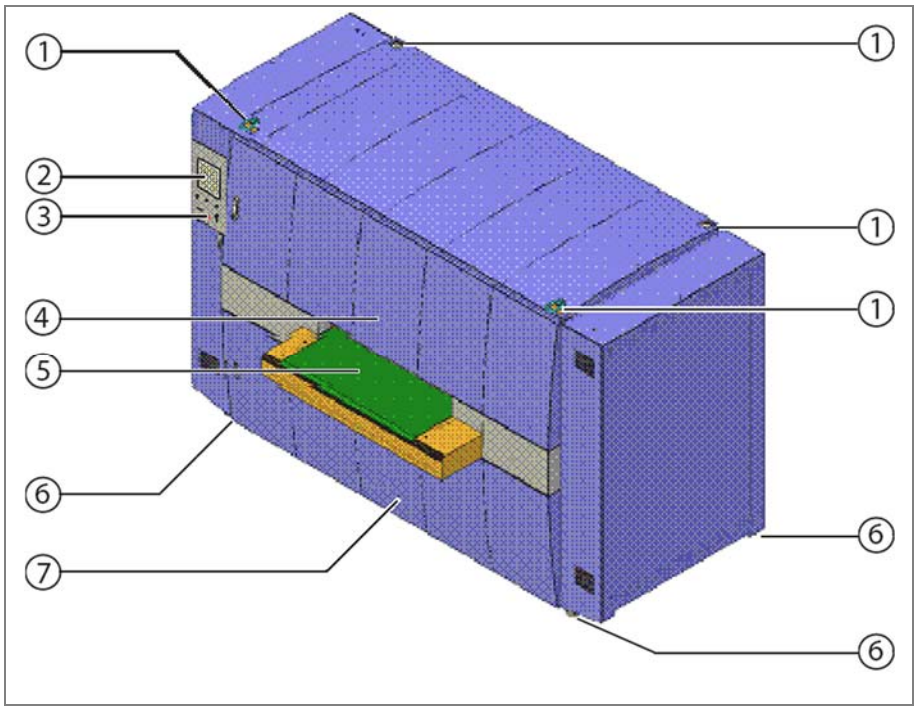


Abb. 6: Components of the machine, input side (front)

1 Attachment points for transporting the machine
2 Touch screen
3 Operating elements and »EMERGENCY STOP« button for immediately shutting off the machine in an emergency
4 Upper door on the input side
5 Conveyor belt for input of workpieces
6 Adjustable machine feet
7 Lower door on the input side

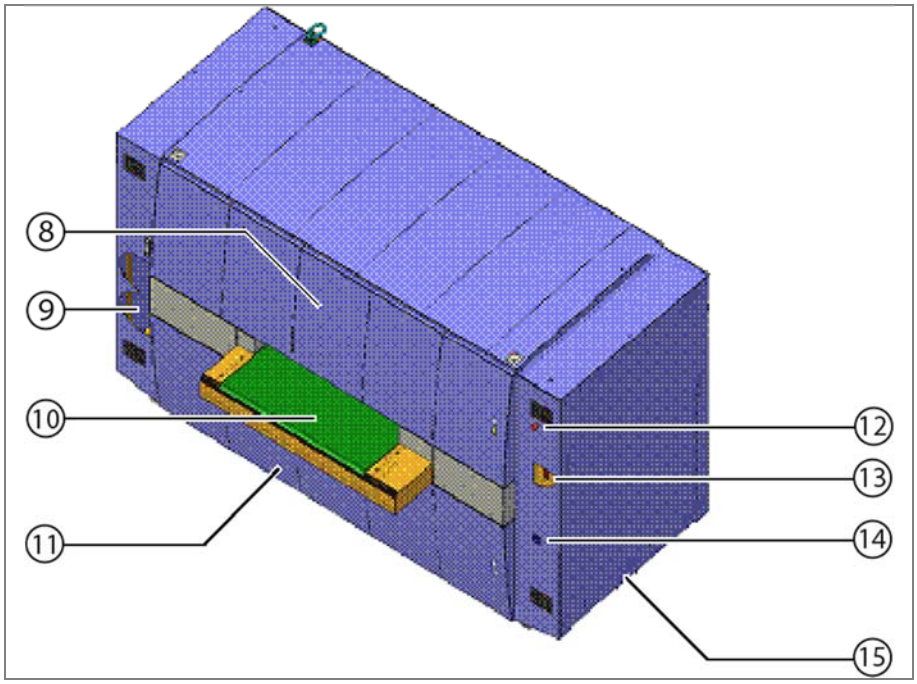


Abb. 7: Components of the machine, output side (back)

8	Upper door on the output side
9	Connection for exhaust system
10	Conveyor belt for output of workpieces
11	Lower door on the output side
12	>EMERGENCY OFF< button for turning on/off the mains supply for the entire machine
13	Main switch for turning on/off the mains supply for the entire machine
14	Socket with earthing contact, e.g., for industrial vacuum cleaner
15	Dust collection container with handle for removal

3.3 Control elements

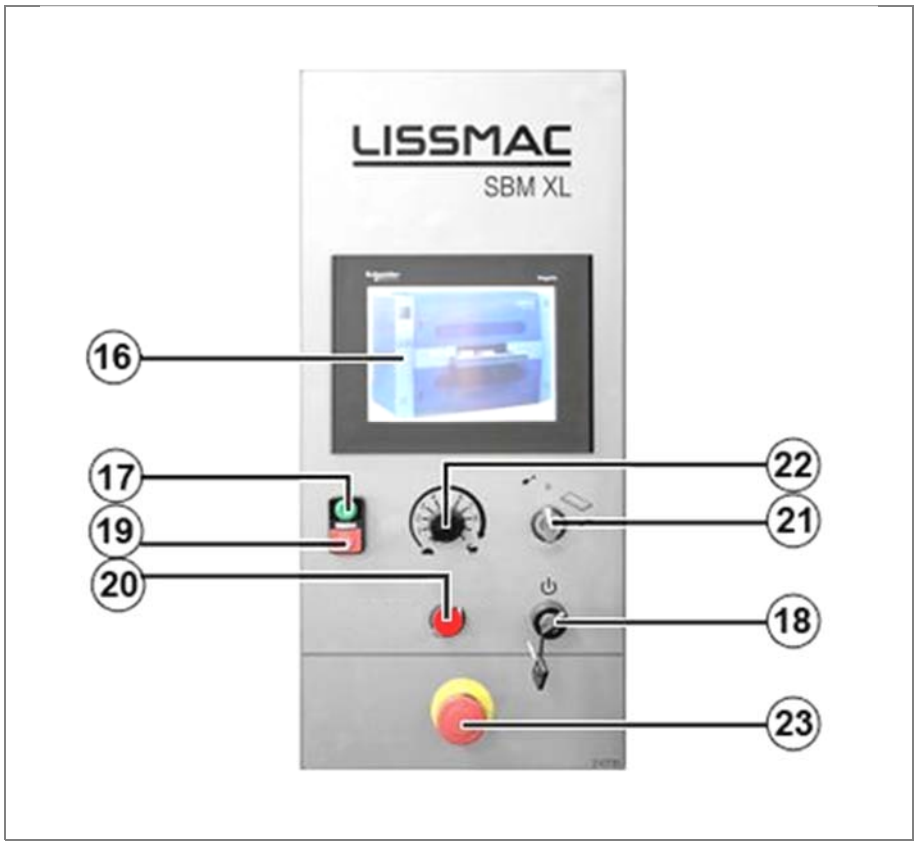


Abb. 8: Operating elements on touch screen

16 Touch screen

17 »Start system« button for turning on the machine

18 »Control voltage Off / On« key switch for turning the mains supply for the drives and for the displays on/off

19 »Stop system« button for turning off the machine

20 >Confirm EMERGENCY OFF < button and >error display< to start the machine after EMERGENCY OFF

21 »Feed back/ forward« rotary switch for turning on the feed and selection of feed direction

22 »Feed speed« variable controller for setting the feed speed

23 »EMERGENCY STOP« button for immediately shutting off the machine in an emergency

3.4 Function

Grinding units for grinding surfaces (SBM-G) and for rounding the edges (SBM-S) are combined in the SBM-XL G2S2 Grinding machine. Grinding units are each installed in pairs up and down. In this way the workpieces can be processed on both sides in one work step.

The workpieces are guided into the machine up and down by feed rollers and transported between the grinding units.

Grinding units can be individually selected.

Each of the four grinding units can be switched on or off individually, as is required for the processing of the workpieces.

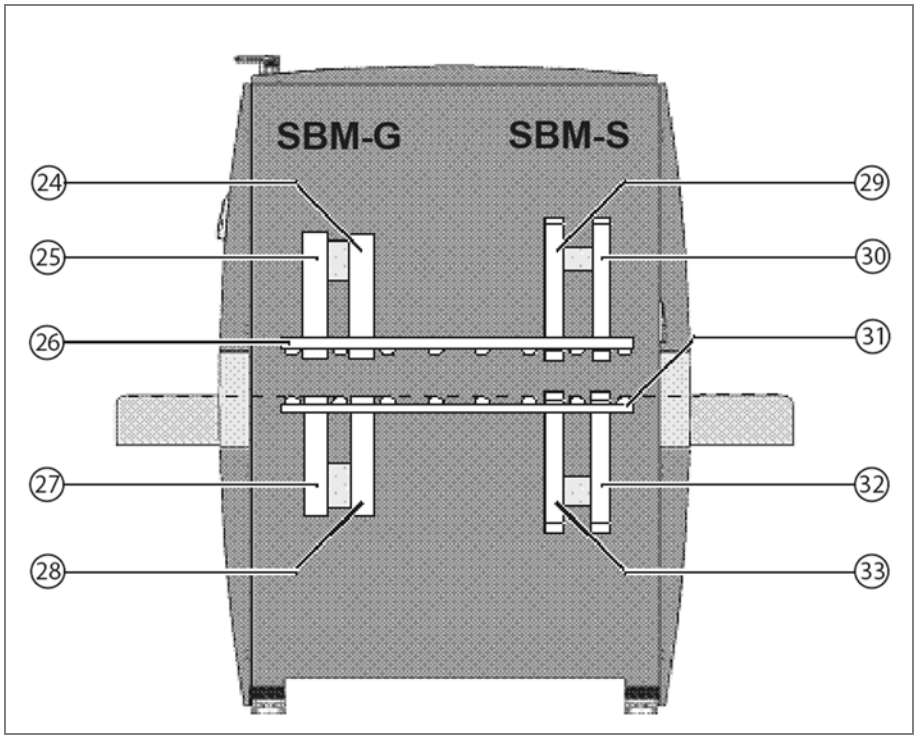


Abb. 9: Grinding units and feed rollers (sectional side view)

24 Upper rear SBM-G grinding unit
25 Upper front SBM-G grinding unit
26 Upper feed rollers
27 Lower front SBM-G grinding unit
28 Lower rear SBM-G grinding unit
29 Upper rear SBM-S grinding unit
30 Upper front SBM-S grinding unit
31 Lower feed rollers
32 Lower front SBM-S grinding unit
33 Lower rear SBM-S grinding unit

Position of grinding units and feed rollers

The positions of the upper and lower grinding units and the upper feed rollers can be set relative to the conveyor level. In this way, for example, workpieces with differing sheet thicknesses can be processed or the grinding results are optimised.

To exchange the grinding medium (tool change) move the upper and lower grinding units completely apart.

The position of the lower feed rollers always remains unchanged at the height of the conveyor belts.

SBM-G grinding units

Grinding belts are mounted onto the SBM-G grinding units. The grinding belts are guided transverse to the conveying direction over the surfaces of the workpieces. In this way the workpieces are evenly ground to the set sheet thickness.

The incline of the front grinding units can be set to achieve a smooth entry of the workpieces.

SBM-S grinding units

Abrasive belts are mounted on the SBM-S grinding units. Abrasive carriers are fastened on the abrasive belts, on which several layers of sand paper are separated from each other by non-woven material. The abrasive carriers are guided transverse to the conveying direction over the workpieces.

In order to process all the interior and exterior contours of the workpieces, the abrasive belts of both upper and lower grinding units move in opposite directions.

3.5 Safety equipment

The SBM-XL G2S2-60 Grinding machine has the following safety equipment:

- »EMERGENCY STOP« buttons on the back of the control cabinet and below the display to immediately shut off the machine in an emergency
- Safety strip on the input side of the conveyor belt turns off the feed to prevent pulling in of hands and other body parts
- Motor overload switch prevents overloading the grinding motors
- Delayed shut off exhaust system

3.6 Technical data

The following information refers to the SBM-XL 1000 G2S2-60 or SBM-XL 1500 G2S2-60 Grinding machines.

		SBM-XL 1000 G2S2-60	SBM-XL 1500 G2S2-60
Dimensions and weight of the machine	Length approx.	3100 mm / 122 inch	3600 mm / 142 inch
	Width (incl. conveyor belt) approx.	2100 mm / 81 inch	2100 mm / 81 inch
	height approx.	2000 mm / 80 inch	2000 mm / 80 inch
	Total weight (without conveyor belt)approx.	3800 kg / 8349 Ibs	4200 kg / 9138 Ibs
Electrical data of the entire machine	Connection value	480 V / 60Hz	480 V / 60Hz
	Power supply	3~ PEN / 3~ PE+N	3~ PEN / 3~ PE+N
	Power (total)	58 kW	67,5 kW
	Power consumption	86 A	99 A
	Power rating (total)	70 kVA	80 kVA
	protection class	IP 42	IP 42
SBM-G grinding units	Number of grinding motors (total)	4	4
	Drive power per grinding motor	6,7 kW	8,95 kW
	Grinding motor speed	1704 rpm	3516 rpm
	Grinding motor power consumption	12,0 A	14,9 A
	Grinding speed	26 m/s	28 m/s
SBM-S grinding units	Number of grinding motors (total)	4	4
	Drive power per grinding motor	3 kW	3 kW
	Grinding motor speed	1705 rpm	1705 rpm
	Power consumption per grinding motor	5,3 A	5,3 A
	Grinding speed	7 m/s	7 m/s
Feed Frame	Number of feed motors	2	2
	Drive power per feed motor	0,37 kW	0,37 kW
	Power consumption per feed motor	1,18 A	1,18 A
	Feed motor speed	1410 rpm	1410 rpm
	Feed speed	0 – 4 m/min 0 – 13 ft/min	0 – 4 m/min 0 – 13 ft/min

		SBM-XL 1000 G2S2-60	SBM-XL 1500 G2S2-60
Feed Tape front / back	Number of feed motors	2	2
	Drive power per feed motor	0,3 kW	0,3 kW
	Power consumption per feed motor	0,93 A	0,93 A
	Feed motor speed	1410 rpm	1410 rpm
	Feed speed	0 – 4 m/min 0 – 13 ft/min	0 – 4 m/min 0 – 13 ft/min
Actuator	Number of actuator motors	5	5
	Drive power per actuator motor	0,75 kW	0,75 kW
	Actuator motor speed	1410 rpm	1410 rpm
	Power consumption per actuator motor	1,81 A	1,81 A
Other data	Emission noise pressure level at operator's place	80 dB(A)	80 dB(A)
Exhaust system	Connection diameter	Ø 250 mm	Ø 250 mm
	Suction output	min. 8000 m³/h	min. 8000 m³/h
Environment	Temperature range	+10° to +40 °C +50° to +104 °F	+10° to +40 °C +50° to +104 °F
	Humidity	5 – 95 % (not condensing)	5 – 95 % (not condensing)
Workpieces	Sheet thickness (height of opening for workpieces)	0 – 120 mm 0 – 4.72 inch	0 – 120 mm 0 – 4.72 inch
	Aperture width for workpieces	50 – 1000 mm 1.97 - 39.37 inch	50 – 1500 mm / 1.97 - 59.09 inch
	Minimum length of workpieces in the direction of travel	150 mm 5.91 inch	150 mm 5.91 inch
	Maximum workpiece weight	300 kg 661 lbs	300 kg 661 lbs

4 Preparation for use

4.1 Transporting the machine

WARNING

Heavy loads

Injury from falling parts

- Only use lifting gear and loading equipment with sufficient lifting capacity.
- Only secure the machine on the four attachment points provided 1.
- Do not stop under the lifted machine.

- To lift the machine, secure the lifting gear on the four attachment points 1.
- Secure the machine with suitable means when transporting on a vehicle.

4.2 Storing the machine

- Pack the machine in plastic film for storage.
- Only store the machine in an indoor space with a dry environment.

4.3 Installation and assembly

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

- Fortified level floor with sufficient load carrying capability
- Temperature range: +10° to +40 °C
- Humidity: 5 – 95 % (not condensing)

4.3.1 Installing machine

- ➢ Fasten the lifting gear to the four attachment points 1.
- ➢ Remove the packaging from the machine.
- ➢ Adjust the machine feet 6 until the machine is horizontally level.

4.3.2 Connecting the machine electrically

DANGER

High voltage

Death or injury from electric shock

- ➢ Only trained electricians may perform the electrical connection and work on the electrical system of the machine.

- ➢ Make sure that the main switch is in the »Off« position.
- ➢ Connect the machine to the power supply.
- ➢ Place the main switch 13 on the back of the machine into the "On" position.
- ➢ Turn on the control voltage with the key switch 18 under the touch screen.
- ➢ Make sure that both »EMERGENCY STOP« buttons, 12 and 23, are activated and a possible EMERGENCY STOP is acknowledged with the 20 button.
  - ↳ The »Start system« button 17 is illuminated. The machine is ready for operation.

The machine is delivered ready for connection to a right-hand power supply. After the electrical installation the running direction of the motors must be checked. If the running direction of the grinding units does not match the marks on the machine, the phase must be changed.

4.3.3 Connecting the exhaust

The machine is only to be operated with a functioning exhaust system. Exhaust system requirements are given in the technical data.

- Install the exhaust system near the machine.
- Connect the exhaust system electrically and secure against accidental starting.
- Connect exhaust ducts of the system to connection 9 of the machine.
- Check the functionality of the exhaust system by turning the exhaust system selection switch to the »MANUAL« position.
- Observe the direction of rotation of the electric motors.

5 Operation

5.1 User interface

Central functions and machine information is called up, displayed and can be changed using the touch screen.

The menus are selected by touching the fields on the surface of the touch screen.

5.2 Structure of the interface

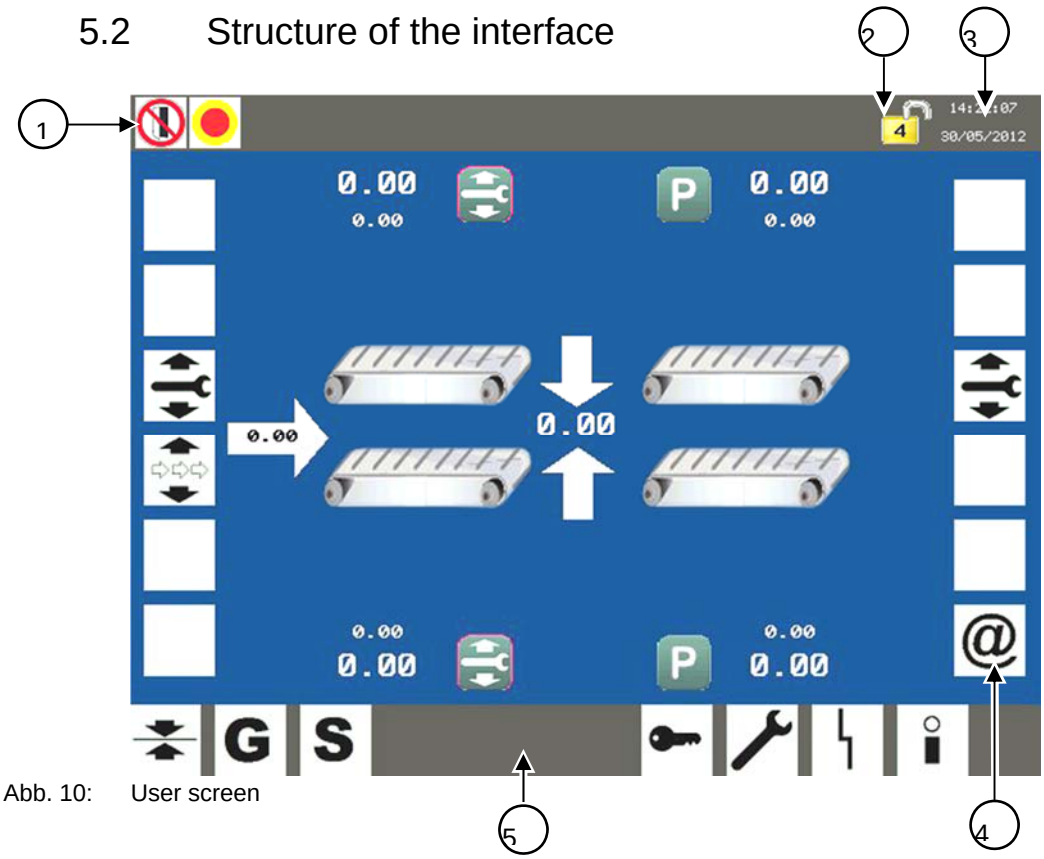


Abb. 10: User screen

	Info area
Pos. 1	Status display
Pos. 2	Display of user level
Pos. 3	Date / Time

	Dependent upon user level
Pos. 4	Option fields > Automatically enabled as needed

	Main menu
Pos. 5	Selection of tools, settings and malfunctions

5.3 Operation using the touch screen

The following list describes and gives an overview of the menus available from there, their information and input options. Functions are only available with the proper user log in.

Main menu	Menu	Functions and displays
	 »Sheet thickness«	Setting the sheet thickness, Manual repositioning of the feed frame
	 »SBM-G«	Set up SBM-G grinding units, Repositioning of the SBM-G grinding units
	 »SBM-S«	Set up SBM-S grinding units, Repositioning of the SBM-S grinding units
	 »Log in«	User identification, Change user
	 »Service«	Current consumption and speed of the G motors Operating hours counter Settings (time, date, language and screen) References Factory default settings
	 »Error messages«	Display of error messages
	 »Info«	Total overview of the machine Tool change and park positions

	Position query
 Red	Unit not in position
 Green	Unit in position

The menu of the SBM-XL G2S2 set up according to the user. Option field (Pos. 4) are only enabled with the correct user log in. This prevents being affected by unauthorised persons.

The user levels (Pos. 2) are shown dependent on the user log in.
The user level 0 is active when the machine is switched on.

	User level with the approved actions:
	User: Setting sheet thickness, Tool change, Wear position of the SBM-G and SBM-S assemblies.
	Setter: All actions of level 0 are included, Running in SBM-G abrasive
	Only accessible by LISSMAC Service

	Status display in Info area (Pos. 1)
	Machine door not closed
	All machine doors are closed
	EMERGENCY STOP is activated
	General error / malfunction see »Error messages«

	Operating mode of axes offset
	Manual mode (jog mode)
	Automatic mode

5.4 Turning on the machine

Before turning on the machine, the following conditions must be checked:

- Running direction of the grinding belts and abrasive belts correspond to the manufacturer's specifications.
- Function readiness of the connected exhaust system is ensured.
- Acceptance of the workpieces at the output side of the machine is ensured.

The SBM-G and SBM-S grinding units can be turned on independently of each other. Thus for each work cycle the surfaces of the workpiece can be ground and/or the edges rounded.

- ➢ Place the main switch 13 on the back of the machine into the "On" position.
- ➢ Set the key switch 18 to the »On« position.
  - ↳ The power supply for the drives and the touch screen is turned on.
- ➢ Make sure that all malfunctions are corrected.
- ➢ Make sure that both »EMERGENCY STOP« buttons, 12 and 23, are activated and a possible EMERGENCY STOP is acknowledged with the 20 button.
  - ↳ The »Start system« button 17 is illuminated.
- ➢ Make sure that the exhaust system selection switch is set to »AUTO«.
- ➢ Press the »Start system« button 17.
  - ↳ The grinding units and the exhaust system are turned on depending on the previous operating mode.

Before grinding can begin, the following pre-requisites must be met:

- The sheet thickness of the workpiece is measured and set on the machine (see 5.5).
- Feed is set (see 5.6).

5.5 Setting sheet thickness

Before processing the workpieces, the sheet thickness of the workpieces must be measured and adjusted on the machine.

The value for the sheet thickness is set commonly for the SBM-G and SBM-S grinding units. This means the upper feed rollers are moved with the upper grinding units upward or downward.

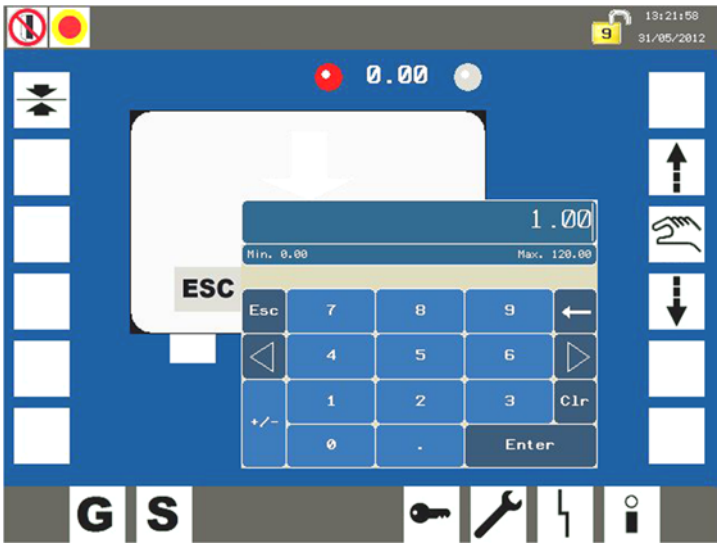


Abb. 11: Setting the sheet thickness

NOTE

Workpieces remaining in the machine

Damage to the machine

- ➢ Make sure that no workpieces are between the feed rollers or in the exhaust duct.

- ➢ To set the sheet thickness, »sheet thickness« must be selected in the main menu
- ➢ The measured sheet thickness can be entered via the interface and confirmed with »ENTER«. Start the positioning with »OK.
- ➢ The sheet thickness can be incrementally positioned in manual mode.
  - ↳ The grinding units move to the set position. The displays of the grinding units change accordingly.

Push the »Start system« button 17 only when the positioning cycle is completely finished.

5.6 Setting feed

Feed speed

The grinding results of the SBM-S grinding units are dependent upon the feed speed, among other things. The following setting values can be used as a guideline for the feed speed:

- Normal setting: approx. 1 m/min
- Large edge rounding: slow feed speed
- Small edge rounding: fast feed speed

Feed direction

In normal operation the workpieces first move through the SBM-G grinding units and then the SBM-S grinding units. This presets the feed direction by arrangingthe grinding units. If necessary the feed direction can be reversed for example, to remove workpieces from the machine.

The direction and speed of the following components are set commonly:

- Conveyor belt on the input side of the machine
- Feed rollers in the machine
- Conveyor belt on the output side of the machine
- Feed capable of being turned on by customer (if available)

CAUTION

Conveyor belt on the input side

Cutting of fingers when putting on the workpiece

- ➢ Wear protective gloves
- ➢ Do not reach into the input opening for workpieces.
- ➢ Lay workpieces on the front edge of the conveyor belt.

- ➢ Set the feed speed on the variable controller 22.
- ➢ To turn on the feed, turn the variable controller 21 to the »forwards« or »reverse« position.

Feed is started along with the grinding units using the » Start system«17 button.

- ➢ To turn off the feed, turn the variable controller 21 to the middle position.

5.7 Grinding workpieces

WARNING

Fine dust and flying sparks

Ignition of grinding dust by flying sparks, dust explosion

- Only operate machine with exhaust system turned on.
- Do not process workpieces made of aluminium or aluminium alloys.
- Empty dust collection containers and exhaust system regularly and clean exhaust ducts.

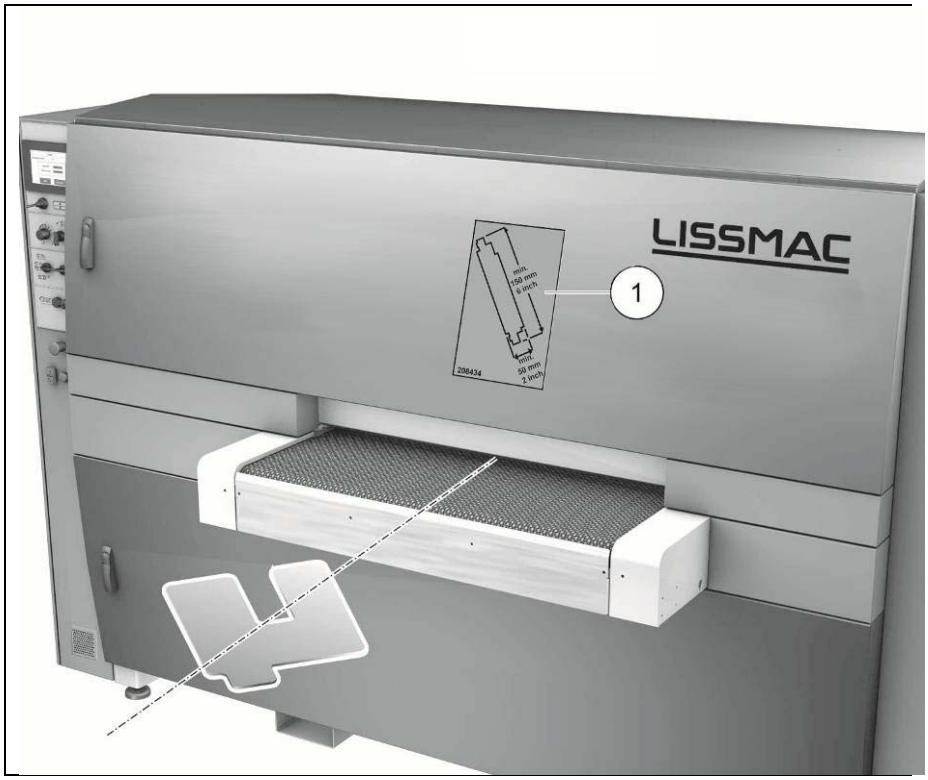
NOTE

Unsuitable workpieces

Damage to the machine, premature wear of the abrasives

- Only grind workpieces with the corresponding minimum length (150 mm) and minimum width (50 mm) and uniform thickness.
- Adjust the value for sheet thickness on the machine to grind workpieces with varying thickness.
- Distribute workpieces evenly over the width of the conveyor belt and lay the outer edge of the workpieces as diagonally as possible on the conveyor belt.
- Cool off hot workpieces to room temperature before grinding.

- Turning on the machine. (see 5.4)
- Measure the sheet thickness of the workpiece and set on the machine (see 5.5).
- Press the »Start system«17 button and lay the workpieces on the conveyor belt on the input side 5.
  - ↳ The turned on grinding units start.
  - ↳ As soon as the grinding motors have reached the maximum speed, the feed starts.
- Set »Feed speed« using the variable controller 22 (see 5.6).
  - ↳ The workpieces are automatically guided through the machine and ground.
- Take the workpieces from the conveyor belt 10 on the output side.



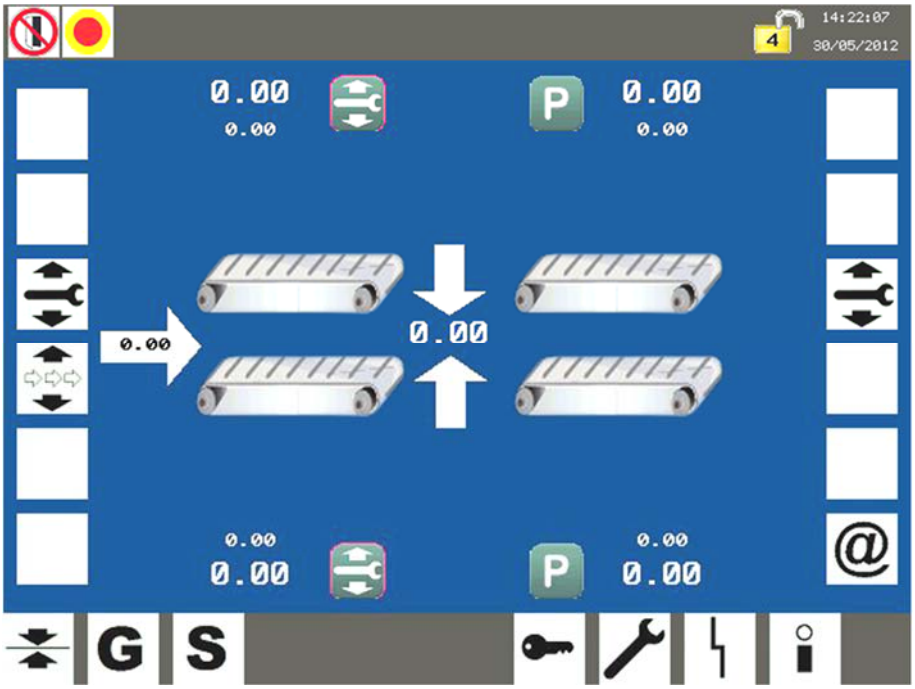
1 Pictogram on the machine

Place workpieces onto the conveyor belt as shown.

To improve the grinding results, e.g. the position of the upper grinding unit can be changed and/or the grinding speed can be adjusted (see page 41 or page 35).

In the »SBM-G« menu the current power consumption of the grinding motors of the SBM-G grinding units are displayed. For increased values the position of the grinding units and the wear of the grinding belts should be checked.

5.8 Grinding units



	Option fields
	Tool change: Units move to their end position Sheet thickness moves to 5 mm position ↳ The units can only be opened in the end position
	Move machine free: Units move to end position and sheet thickness remains unchanged. ↳ Material can be moved out of the system if damaged
	Contact with manufacturer

	Status of the units
	Tool change position reached
	Free movement of workpiece reached
	Park position ↳ Motors are and remain inactive

5.8.1 Workpieces remaining in the machine

NOTE

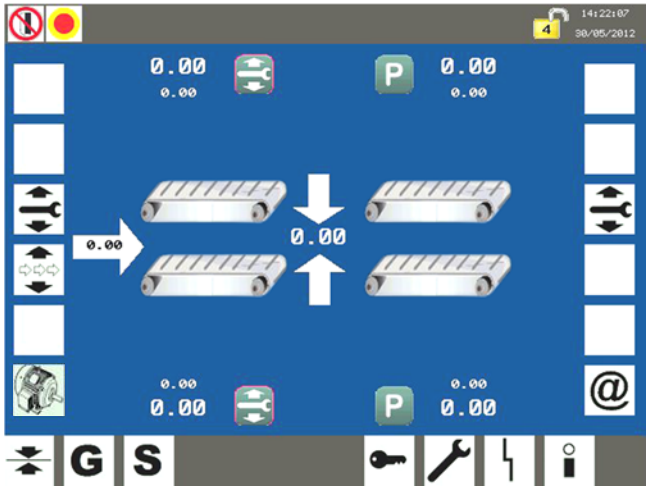
Workpieces remaining in the machine

Damage to the machine

- Make sure that no workpieces are between the feed rollers or in the exhaust duct.

- Press the »Stop system« button 19. To switch off the machine.
- Select »Info« on the touch screen menu.
- Touch the field »Move machine free«, to move the grinding units in the end position.
- Press the »Start system« button 19.
- Remove the workpiece via the »feed controller« 22

5.8.2 Turning the SBM-G grinding unit on/off



	Option fields
	Motor start ↳ Release for motor start

➢ Press the »Stop system« button 19.

Turning off the grinding unit.

To turn off the SBM-G unit:

➢ Select »Info« on the touch screen menu.

➢ Touch the »upper SBM-G« display to move the upper grinding unit into the end position and turn it off.

or

➢ Touch the »lower SBM-G« display to move the lower grinding unit into the end position and turn it off.

↳ The field changes the display, the selected grinding unit moves into the park position.
The change of position is displayed.

Turning on the grinding unit

To turn on the SBM-G unit:

➢ Press the »Stop system« button 19.

➢ Select »Info« on the touch screen menu.

➢ Touch the »upper SBM-G« display, to activate the upper grinding unit.

or

➢ Touch the »lower SBM-G« display, to activate the lower grinding unit.

↳ The display changes.

➢ Press the »Start system« button 19.

↳ The units are moved into position, motors do not start.

➢ Activate the motors in the screen via »Motor start«

↳ Start motors

5.8.3 Turning the SBM-S grinding unit on/off

➢ To turn the SBM-S grinding unit on or off, proceed as in chapter 5.8.12.

5.9 Changing the position of the upper and lower grinding units

To optimise the grinding results during operation, the position of the upper and lower SBM-G and SBM-S grinding units relative to the position of the upper feed rollers can be changed. This varies the pressure applied on the workpiece and therefore the material removal. The set »Target sheet thickness« remains unchanged.

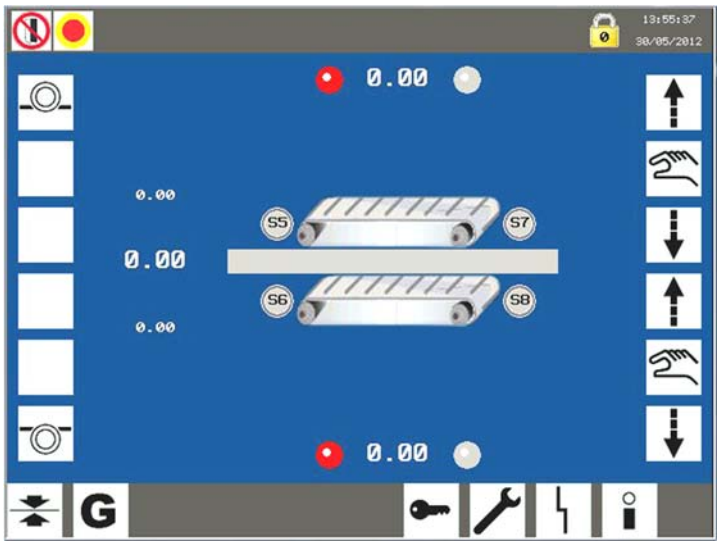
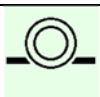


Abb. 12: Changing the position of the upper grinding unit

	Option fields
	Top unit: Setting of the abrasive Tool change
	Bottom unit: Setting of the abrasive Tool change

5.9.1 Changing the position of the SBM-G grinding unit

- Press the »Stop system« button 19.
- To change the position of the SBM-G grinding units, select the »SBM-G« menu.
- Move the grinding units upwards or downwards with the arrow keys for »SBM-G upper« or »SBM-G lower«. Briefly tapping an arrow key changes the position, when touching continually the grinding unit keeps moving.
  - ↳ The current position of the upper SBM-G grinding unit is displayed on the position display.

The changed position of the grinding units is reset after changing the abrasive, if the display in the »Tool change« menu is selected.

5.9.2 Changing the position of the SBM-S grinding unit

- To change the position of the SBM-S grinding units, select the »SBM-S« menu.
- Move the grinding units upwards or downwards with the arrow keys for »SBM-S upper« or »SBM-G lower«. Briefly tapping an arrow key changes the position, when touching continually the grinding unit keeps moving.
  - ↳ The current position of the upper SBM-G grinding unit is displayed on the position display.

The changed position of the grinding units is reset after changing the abrasive, if the display in the »Tool change« menu is selected.

5.9.3 Changing position during running operation

To change the position of the SBM-G or SBM-S grinding units during operation in single steps:

- Select the SBM-G or SBM-S menu.
- Tap the arrow key for the required direction change.
  - ↳ The grinding unit moves in increments.

5.10 Turning off the machine

The machine can be turned off immediately in an emergency by pressing either of the two »EMERGENCY STOP« buttons 12 or 23.

After activating button 12 or 23 and acknowledging with button 20, the machine can be started with the »Start system« 17 button.

- To turn off the feed, turn the variable controller 24 to the middle position.
- Press the »Stop system« button 19.
  - ↳ The grinding units stop.
  - ↳ The exhaust system runs for a short time afterwards.
- Set the sheet thickness on the maximum value and make sure that no more workpieces are in the machine.
- Turn off the power supply for drives, displays and touch screen by turning the key switch 18.
- To turn off the power supply for the entire machine, set the main switch 13 to the »Off« position.

Do not switch off the machine directly via the key switch (18) or by the main switch (13).

6 Maintenance and Cleaning

6.1 Changing the abrasive

The upper and lower grinding units can be moved completely apart. Then the grinding belts of the SBM-G grinding units or the abrasive belts of the SBM-S grinding units can be changed more easily (tool change).

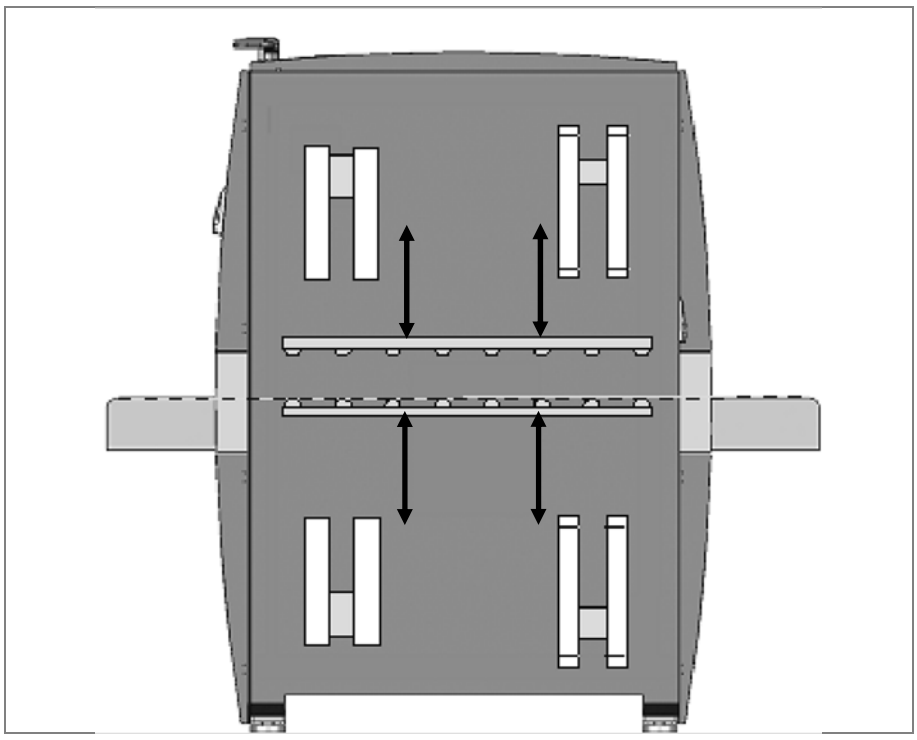


Abb. 13: Changing the abrasive

Specifications of the grinding belts, see 9.7 Working Width of the grinding belt.

6.1.1 Changing the grinding belts of the SBM-G grinding units

Worn or damaged grinding belts must be replaced immediately.

The following facts suggest worn grinding belts:

- Message »Grinding belt malfunction«
- Increased power consumption of the grinding motors
- Poor grinding result

For the SBM-G grinding units the grinding belts should always be changed in pairs (upper and lower grinding unit).

NOTE

Workpieces remaining in the machine

Damage to the machine

➢ Make sure that no workpieces are between the feed rollers or in the exhaust duct.

Removing old grinding belts.

➢ Select the »Info« menu and »Tool change« field.

↳ After positive acknowledgement of the security prompt the upper and lower grinding units are moved apart to the end position.

➢ Open both doors 4 and 7 on the input side of the machine.

➢ Loosen the lever on the front grinding units 25 and 27 and swing the front grinding units outward.

➢ Loosen the press lever on the deflection rollers of the grinding units 24, 25, 27 and 28.

↳ The grinding belts are relaxed.

➢ Remove the grinding belts from the drive belts.

Drive belts, deflection rollers and counter-pressure rollers of the grinding units should be cleaned and controlled for damage and wear after removing the grinding belts.

Putting on new grinding belts

➢ Place new grinding belts on the drive belts and pay attention to the correct running direction.

➢ Tighten the press lever on the deflection rollers of the grinding units 24, 25, 27 and 28.

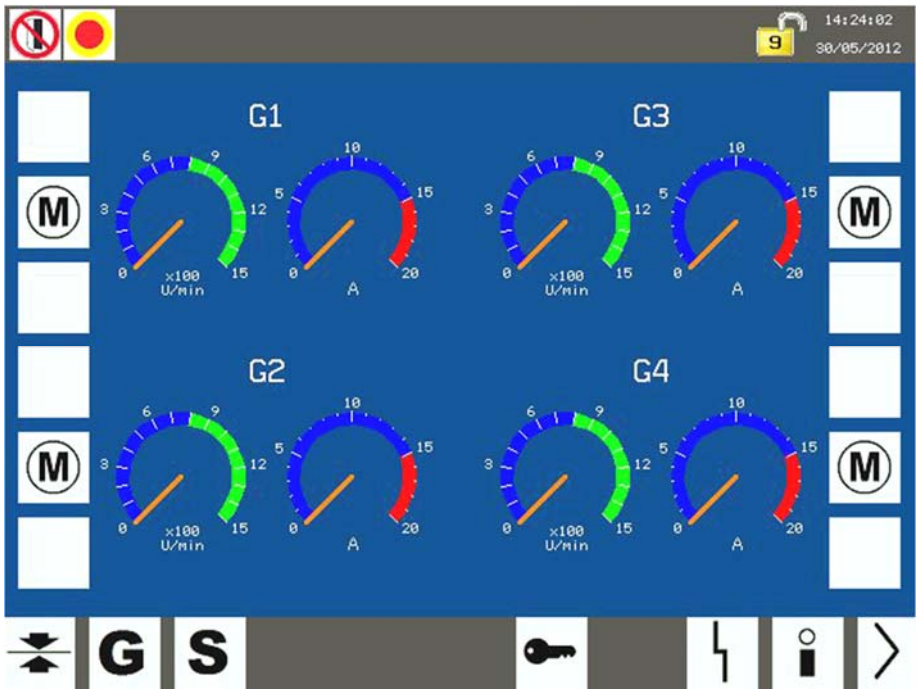
⚠ CAUTION

Opened doors and swung out front grinding units

Cutting off fingers and other body parts!

- Make sure that the feed is turned off.
- Only entrust the work to authorised personnel.
- Only start the machine with extreme caution.

- In the »SBM-G« menu select the »Tool changed« field.



	Option fields
M	Motor symbol ➢ Repeated multiple switching on leads to overheating of the frequency converter

Checking running of the belt

- Level 4 user log in
- Select »Service« in the main menu.
- Select the motor whose belt should be run in while paying attention to the instructions on the touch screen.
- Start the motor by pressing the »Motor symbol« button and make sure that all the grinding belts run in the middle of the drive belts.

If necessary align the deflection rollers to the grinding units with the aid of set screws. For this the clamp screws on the deflection rollers must be loosened. The deflection rollers must be aligned so that the abrasive belts run on the drive belts. Only perform this work with the motor turned off!

- If the position of the deflection rollers must be corrected, turn off the motor and secure against accidental starting.
- Perform adjustments and the check.
- Proceed in the same way for the other belts while paying attention to the danger zones.

Closing the machine

- Stop the machine by pressing the »Stop system« button 19.
- Swing the front grinding units 25 and 27 towards the inside and lock the lever on the grinding units.
- Close both doors 4 and 7 on the input side of the machine.

The changed position of the grinding units is reset after changing the abrasive, if the display in the »Tool change« menu is selected.

- In the »SBM-G« menu select the »Tool change« field and confirm the prompt.

6.1.2 Changing the abrasive belts of the SBM-S grinding units

Worn or damaged abrasive belts must be replaced immediately. For the SBM-S grinding units the abrasive belts can be changed individually

NOTE

Workpieces remaining in the machine

Damage to the machine

- Make sure that no workpieces are between the feed rollers or in the exhaust duct.

Removing old abrasive belts.

- Select the »Info« menu and »Tool change« field.
  - ↳ After positive acknowledgement of the security prompt the upper and lower grinding units are moved apart to the end position.
- Fold the supports on the conveyor belt 10 up and open both doors 8 and 11 on the output side of the machine.
- Loosen the lever on the front grinding units 30 and 32 and swing the front grinding units outward.
- Unscrew the front guide plate on the upper grinding units 29 and 30.
- To loosen the abrasive belts of the grinding units 29, 30, 32, and 33, loosen the counter nut of the tensioning screw with an impact screw driver and screw on the tensioning screw.
- Remove the abrasive belts for the back guide plates.

Deflection rollers and counter-pressure rollers of the grinding units should be cleaned and checked for damage and wear after removing the abrasive belts.

Putting on new abrasive belts

- Place new abrasive belts on the back guide plates and pay attention to the correct running direction.
- To tighten the abrasive belts of the grinding units 29, 30, 32, and 33, screw on the tensioning screw up to the mark and secure with the counter nut.
- Screw on the front guide plate on the upper grinding units 29 and 30.
- Make sure that all abrasive belts run lightly on the guide rollers.
- Swing the grinding units 29 and 33 towards the inside and lock the lever on the grinding units.
- Close both doors 8 and 11 on the output side of the machine.

The changed position of the grinding units is reset after changing the abrasive, if the display in the »Tool change« menu is selected.

- In the »SBM-S« menu select the »Tool change« field and confirm the prompt.

6.2 Cleaning

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

CAUTION

Dust

Long-term damage to health from inhalation

- Wear dust protection mask when cleaning the machine
- Turn on the exhaust system before cleaning.
- Do not blow out the machine with compressed air.

WARNING

Fire hazard from pockets of embers

Burn injuries or damage to the machine

- Completely remove dust and pockets of embers

A dust collection container 15 is located under the machine, which can be pulled out for emptying.

- Turn on the exhaust system by turning the selection switch on the exhaust system in the the »MANUAL« position.
- Open doors 4, 7, 8 and 11 and vacuum out the dust with an industrial vacuum cleaner.
- Pull out the dust collection container 15 under the machine by the handle, empty with industrial vacuum cleaner and push back under the machine.
- Loosen the wing nuts of the inspection cover on the exhaust duct of the machine, remove cover, clean exhaust duct.
  Then refasten the inspection cover.
- Set the selection switch on the exhaust system back into the »AUTO« position.
- Empty the dust container of the exhaust system and clean with suitable agent.

The dust which is removed must be disposed of according to the applicable regulations.

6.3 Changing the filter pad on the control cabinet

NOTE

Dirty filter pads

Overheating and damage to the controls

- Clean or replace filter pads once per week.

- Remove both covers on the control cabinet on the the input side and the output side.
- Remove filter pads and clean or replace with new filter pads.
- Place covers on with slight pressure until they engage.

7 Service

7.1 Service intervals

The following service work should be performed regularly in the specified intervals.

The intervals are shortened corresponding to multiple-shift operation.

Service work	Interval
Clean interior of the machine and dust collection container	daily/once per shift every 8 hrs
Clean/replace filter pads on the control cabinet	weekly
Change grinding belts or abrasive belts of the grinding units	with poor grinding results/ with damage
Change the position of the upper grinding units	with poor grinding results
Check drive belts, deflection rollers and counter-pressure rollers of the grinding units for wear	at tool change
Tighten/change V-belts	semi-annually/with damage
Lubricate spindle threads for height adjustment	monthly
Align the deflection rollers of the SBM-G grinding units	as needed/after tool change
Inclining the front SBM-G grinding units	as needed

7.2 Service work

7.2.1 Tightening/replacingV-belts

The force of the grinding motors is transferred via the V-belts to the driver rollers of the grinding units.

V-belts are correctly tightened, if they can be pushed down by hand with average applied force by one V-belt width.

Damaged V-belts must be replaced immediately.

- Open the doors of the machine.
- Check the V-belts on the grinding units for damage and remove damaged V-belts.
- To place on a new V-belt, loosen the clamp screws on the fastening plate for the grinding motors and loosen the tensioning screws.
- Check the tension of the V-belt.
- If the tension of the V-belt is too low, loosen the clamp screws on the fastening plate for the grinding motors and tighten the tensioning screws until the V-belt is correctly tensioned.
- Tighten the clamp screws and close the doors on the machine.

7.2.2 Lubricating the spindle threads for the height adjustment

The lubrication points of the machine are centrally located at two locations. They are easily accessible via the side doors of the machine.

- Open the side doors of the machine.
- Fill with suitable multi-purpose lubricant using a grease gun on the lubrication nipples.
- Close the side doors on the machine.

7.2.3 Inclining the front SBM-G grinding units

The incline of the upper and lower front SGM-G grinding units can be set independently of each other to achieve a smooth entry of the workpieces. To aid this, the grinding units are each supported on two screws

7.2.4 Adjusting the height of the front SBM-G grinding units

The height of the front SBM-G grinding units 25 and 27 can be adjusted individually using set screws. For this the grinding material removal can divided evenly on the front and back grinding units.

Both set screws must each be uniformly adjusted. The current setting can be read on the set screws.

- Open the doors on the input side of the machine
- Adjust the set screws of the upper and lower front grinding unit evenly.
- Close the doors on the machine.

Notes:

8 Troubleshooting

8.1 Messages

The various operating states of the machine are displayed by messages on the touch screen.

Some messages inform about malfunctions on the machine. These are displayed as text displays in the »Error messages« menu.

Miscellaneous

Error Status	Description	Cause	Solution
0001	EMERGENCY STOP	EMERGENCY STOP engaged	➢ Reset Emergency stop
0002	Motor protection axles	Motor overloaded	➢ Check motor protection
0010	Door open	Upper front door opened	➢ Close door
0011	Door open	Door open front bottom	➢ Close door
0012	Door open	Upper rear door opened	➢ Close door
0013	Door open	Lower rear door opened	➢ Close door
0050	Motor protection exhaust system	Motor protection (external) triggered	➢ Reset motor protection ➢ Restart ➢ see operating instructions for exhaust system
0051	Malfunction in exhaust system	Motor protection triggered	➢ Reset motor protection ➢ Restart ➢ see operating instructions for exhaust system
0100	Safety strip	Safety strip triggered	➢ Release safety strip ➢ Restart
0101	Motor protection conveyor belt	Motor overloaded	➢ Check motor protection
0102	Converter belt converter	Malfunction in frequency converter	➢ see operating manual for frequency converter

Sheet thickness

Error Status	Description	Cause	Solution
0201	Max. end position sheet thickness	End position of sheet thickness reached	➢ Move from the end position
0202	Min. end position sheet thickness	End position of sheet thickness reached	➢ Move from the end position
0203	Sheet thickness plausibility error	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axles ➢ Check direction of rotation of motor ➢ Check measurement system
0204	Lower distance to adjacent axle (sheet thickness)	Collision protection	➢ Move with the axles out of the area
0207	Converter sheet thickness	Malfunction in frequency converter	➢ see operating manual for frequency converter

UPPER G-unit

Miscellaneous

Error Status	Description	Cause	Solution
0401	Max. end position G upper	End position G reached	➢ Move from the end position
0402	Min. end position G upper	End position G reached	➢ Move from the end position
0403	Plausibility error G upper	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axles ➢ Check direction of rotation of motor ➢ Check measurement system
0404	Lower distance to adjacent axle G upper	Collision protection	➢ Move with the axles out of the area
0406	Unit open G upper	Unit opened	➢ Close units ➢ Check wires
0407	Converter G upper	Malfunction in frequency converter	➢ see operating manual for frequency converter

Front assembly

0500	Motor protection G1	Motor overloaded	➢ Check motor protection
0501	Speed G1	Delivery too strong Wrong grinding belt Wrong sheet thickness	➢ Change delivery ➢ Change grinding belt ➢ Check sheet thickness

Rear assembly

0550	Motor protection G3	Motor overloaded	➢ Check motor protection
0551	Speed G3	Motor overloaded	➢ Check motor protection

LOWER G-unit

Miscellaneous

Error Status	Description	Cause	Solution
0601	Max. end position G lower	End position G reached	➢ Move from the end position
0602	Min. end position G lower	End position G reached	➢ Move from the end position
0603	Plausibility error G lower	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axles ➢ Check direction of rotation of motor ➢ Check measurement system
0604	Lower distance to adjacent axle G lower	Collision protection	➢ Move with the axles out of the area
0606	Unit open G lower		➢ Close units ➢ Check wires
0607	Converter G lower	Malfunction in frequency converter	➢ see operating manual for frequency converter

Front assembly

0700	Motor protection G2	Motor overloaded	➢ Check motor protection
0701	Speed G2	Delivery too strong Wrong grinding belt Wrong sheet thickness	➢ Change delivery ➢ Change grinding belt ➢ Check sheet thickness

Rear assembly

0750	Motor protection G4	Motor overloaded	➢ Check motor protection
0751	Speed G4	Delivery too strong Wrong grinding belt Wrong sheet thickness	➢ Change delivery ➢ Change grinding belt ➢ Check sheet thickness

UPPER S-unit

Miscellaneous

Error Status	Description	Cause	Solution
0801	Max. end position S upper	End position S reached	➢ Move from the end position
0802	Min. end position S upper	End position S reached	➢ Move from the end position
0803	Plausibility error S upper	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axles ➢ Check direction of rotation of motor ➢ Check measurement system
0804	Lower distance to adjacent axle S upper	Collision protection	➢ Move with the axles out of the area
0806	Unit open S upper		➢ Close units ➢ Check wires
0807	Converter S upper	Malfunction in frequency converter	➢ see operating manual for frequency converter

Front assembly

0900	Motor protection S5	Motor overloaded	➢ Check motor protection

Rear assembly

0950	Motor protection S7	Motor overloaded	➢ Check motor protection

LOWER S-unit

Miscellaneous

Error Status	Description	Cause	Solution
1001	Max. end position S lower	End position S reached	➢ Move from the end position
1002	Min. end position S lower	End position S reached	➢ Move from the end position
1003	Plausibility error S lower	No movement Wrong direction	➢ Check motor control ➢ Check for free movement of the axles ➢ Check direction of rotation of motor ➢ Check measurement system
1004	Lower distance to adjacent axle S lower	Collision protection	➢ Move with the axles out of the area
1006	Unit open S lower		➢ Close units ➢ Check wires
1007	Converter S lower	Malfunction in frequency converter	➢ see operating manual for frequency converter

Front assembly

1100	Motor protection S6	Motor overloaded	➢ Check motor protection

Rear assembly

1150	Motor protection S8	Motor overloaded	➢ Check motor protection

8.2 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
Phone +49 (0) 7564 / 307 - 0
Fax + 49 (0) 7564 / 307 - 500
E-mail: lissmac@lissmac.com
Web: www.lissmac.com

9 Wear parts and consumables

9.1 SBM-XL 1000 G1S2-60 Grinding machine

Order number	Wear part
208081	Feed roller
611100	Corrugated roller Ø 12 mm
208096	KU cylinder bushing
208169	Conveyor belt 1000 x 2000 mm
611026	Sheet - Front exhaust
611027	Sheet - Rear exhaust
611028	Sheet - Upper exhaust
611029	Exhaust elbow

9.2 SBM-XL 1500 G1S2 Grinding machine

Order number	Wear part
208559	Feed roller
611100	Corrugated roller Ø 12 mm
208096	KU cylinder bushing
208592	Conveyor belt 1500 x 2000 mm
611026	Sheet - Front exhaust
611027	Sheet - Rear exhaust
611028	Sheet - Upper exhaust
611029	Exhaust elbow

9.3 SBM-G 1000 grinding units

Order number	Wear part
209305	Power belt
260298	V-belts (set of 2)
611064	Deflection roller for grinding belt
681235	storage
611062	V-belt pulley bearing
611063	V-belt pulley tensioning unit
207404	Ball bearing for V-belt pulley tensioning unit
206627	Counter pressure ball bearing

9.4 SBM-G 1500 grinding units

Order number	Wear part
209306	Power belt
208995	V-belts (set of 2)
611064	Deflection roller for grinding belt
681235	storage

Order number	Wear part
611062	V-belt pulley bearing
611063	V-belt pulley tensioning unit
207404	Ball bearing for V-belt pulley tensioning unit
206627	Counter pressure ball bearing

9.5 SBM-S grinding units

Order number	Wear part
206033	V-belts (set of 2)
681235	storage
611062	V-belt pulley bearing
611063	V-belt pulley tensioning unit
207404	Ball bearing for V-belt pulley tensioning unit
206627	Counter pressure ball bearing
691883	Belt guide - front
691884	Belt guide - rear
208022	Belt guide ball bearing

9.6 Exhaust system

Order number	Wear part
207706	Star filter cartridge 10 qm

9.7 Working Width of the grinding belt

Machine type	Belt dimensions mm		Belt dimensions inch		Working with mm	Working with inch
SBM-XL 1000 G2S2	70	3994	2,75	157,25	1000	39
SBM-XL 1500 G2S2	70	4991	2,75	196,50	1500	59

Length tolerance for SBM belts: +/- 0.118" (+/- 3mm)

Recommended for SBM-XL machines: 3M Cubitron II 784F in 36+

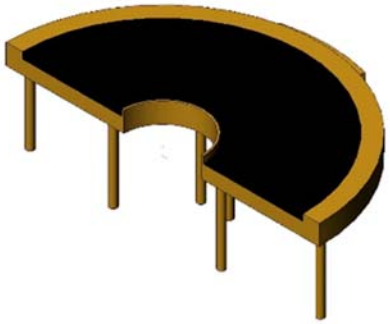
9.8 Transport belts

Control – transport belts

Control of infinitely variable speed designed for operation of maximum 3 transport belts (straight). Control is already integrated in the curve transport belts.

Technical data	Transport belt 1m	Transport belt 2	Transport belt 3 m
Useful width:	1,000mm/1,500mm	1,000mm/1,500mm	1,000 mm / 1,500 mm
Length:	1,000 mm	2,000 mm	3,000 mm
Weight of conveyed material:	300 kg per m²	300 kg per m²	300 kg per m²
Conveyor height:	950 mm +/- 50 mm	950 mm +/- 50 mm	950 mm +/- 50 mm
Temperature range:	+15 °C - +40 °C	+15 °C - +40 °C	+15 °C - +40 °C
Item no.:	825407 / 825405	825191 / 825195	825406 / 825408

Technical data	Curve transport belt
Conveying angle:	180 °
Useful width:	1,100 mm / 1,700 mm
Belt inside radius:	450 mm / 450 mm
Belt outside radius:	1,550 mm / 2,150 mm
Weight of conveyed material:	max. 150 kg total load
Conveyor height:	950 mm +/- 50 mm
Temperature range:	+15 °C - +40 °C
Max. part size:	800 x 700 mm / 800 x 1,200 mm
Item no.:	825400 / 825401



10 Taking out of operation and disposal

If the machine should be dismantled after the end of its service life, it must be properly disassembled and the individual parts delivered 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 conditions

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
- Flushing head seals
- 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
- Bowden cables
- Lamella
- Diaphragms
- Spark plugs, glow plugs
- Parts of reversing starters, such as crank cable, crank handle, crank roller, crank spring
- Sealing brushes, sealing rubber, splash guard cloths
- All types of filters
- Drive and deflector rollers and bracings
- Cable laying protection elements
- Running and drive wheels
- Water pumps
- Cut goods transport rollers
- Drilling, separating and cutting tools
- Transport belt
- Rubber scrapers
- Needle felt protection
- Energy storage
- Brush 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.