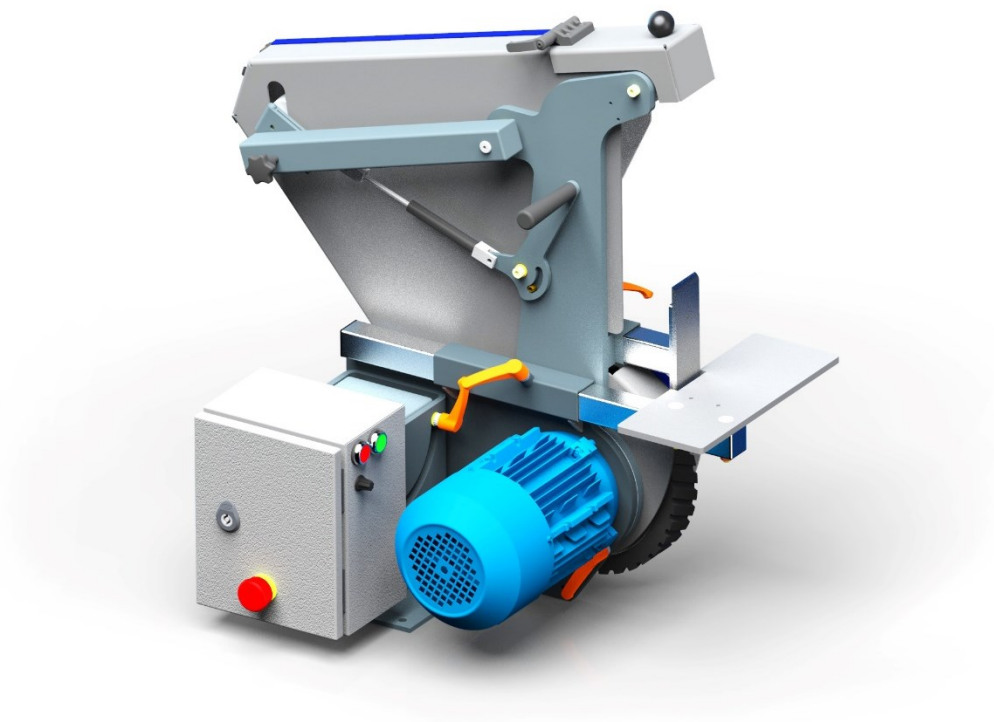


# Belt grinder

BS-1



## Operating Manual

Version 1.3 (12/2021)

# Table of Contents

1	Safety instructions.....	2
1.1	Use personal protective equipment (PPE) .....	2
1.2	Wear suitable clothing .....	3
1.3	Safety sticker .....	3
1.4	Physical condition.....	3
1.5	Working method and work area .....	3
1.6	Take into account the environmental influences at the workplace.....	3
1.7	Power supply .....	3
1.8	Authorized Persons .....	4
1.9	When grinding .....	4
1.10	Residual risks .....	4
2	Technical data and main measures .....	5
3	Description of the machine and its components .....	6
4	Setup.....	8
5	Usage .....	9
5.1	Installin and removing the sanding belt.....	9
5.2	Start the grinding machine.....	9
5.3	Stop the grinding machine .....	9
5.4	Fine adjustment of the belt position .....	9
5.5	Use of the grinding areas .....	10
5.6	Assembly of the flat grinding plate .....	10
5.7	Using the flat grinding plate .....	10
5.8	Angle adjustment of the grinding arm .....	10
5.9	Using the tilt mechanism.....	11
6	Maintenance and cleaning .....	11
7	Equipment .....	12
8	Troubleshooting .....	12
9	Circuit diagram .....	14
10	Declaration of conformity .....	15

# 1 Safety instructions



Read these instructions carefully and completely before setting up, starting up and using the machine. The operating instructions are part of the machine. Therefore, keep the instructions in a safe place for future reference.

**ATTENTION:** For your own safety, you should not attempt to operate this machine until it has been fully assembled and installed according to these instructions.

**ATTENTION:** Basic safety precautions should always be followed when using power tools to reduce the risk of fire, electric shock, and personal injury.

## 1.1 Use personal protective equipment (PPE)



When operating machines, foreign objects can get into your eyes, which can cause serious eye damage. Safety glasses or other suitable eye or face protection must be used at all times.



Use earplugs or ear protection when the machine is in operation.



Non-slip safety shoes are recommended when you operate the machine and handle large workpieces. Be aware that the floor can become wet and slippery when using coolant.



To protect against injury or burns, suitable safety gloves must be worn each time the machine is used.



Use suitable respiratory protective equipment (dust mask, etc.) if dust is generated during processing. Exposure to high concentrations of dust caused by the processing of hardwood, softwood and artificial composite panels can lead to serious damage to health! Find out about the required filter class, depending on the material to be sanded.

## **1.2 Wear suitable clothing**

- Do not wear loose clothing, ties, or jewelry that can get caught on moving parts of the machine.
- Roll up long sleeves to just above the elbow.
- If you have long hair, wear a hairnet or a hat.

## **1.3 Safety sticker**

- Identify and read all warning notices on the machine.
- It is important that all health and safety label stickers are not removed, defaced, or covered. Notes that have become unrecognizable must be renewed immediately!

## **1.4 Physical condition**

- It is forbidden to use the machine under the influence of medication, alcohol or drugs!
- If you feel tired or unable to concentrate, stop working for your own safety.

## **1.5 Working method and work area**

- Make sure you have enough space to safely operate the machine in any foreseeable operation.
- Untidy work areas and workbenches create a risk of accidents. Keep workbenches clear and tidy and remove tools from the immediate area around the machine
- Make sure the floor area is kept clean and free of dust and dirt, which can cause tripping or slipping.
- Always work carefully and in a controlled manner.

## **1.6 Take into account the environmental influences at the workplace**

- Do not expose the device to rain or wet conditions. The machine must not be used outdoors.
- Keep the work area well lit and ensure that artificial lighting is available when there isn't enough natural light to effectively illuminate the work area. The lighting should be bright enough to avoid shadows and eye strain.
- Do not use the device in environments with a risk of explosion, e.g. in the vicinity of flammable liquids, gases or dust.
- High levels of dust generated when working with wood can lead to fire or explosion hazards.

## **1.7 Power supply**

- The electrical voltage of the machine must match the voltage of the power grid.
- The connection plug of the machine must always match the socket. The plug must not be modified in any way. If a replacement plug is required, it should be fitted by a competent person and be of the correct type and capacity of the machine.
- If you are unsure of all electrical connections, always contact the machine manufacturer or a qualified electrician.
- Keep the power cord away from heat, oil and sharp edges.
- Before unplugging the machine, the main switch must be switched off.

- Never open the switch cabinet when the power cord is plugged in!

### **1.8 Authorized Persons**

- Only one person can use the machine at the same time.
- The machine may only be used by trained persons.
- Unauthorized persons and especially children must keep a safety distance of 2 meters from the running machine.

### **1.9 When grinding**

- Always make sure you have a secure footing when working.
- Always keep a firm grip on the workpiece.
- If workpieces with sharp edges are pressed against the sanding belt, the workpieces can be thrown away, the sanding belt can rip and injuries can occur. Always grind so that the sanding belt does not come into contact with sharp edges or carefully round them at the beginning of the work.
- If possible, always support the workpiece with the grinding table.
- Note that ground objects can get very hot! Use sharp abrasives, protective equipment and, if possible, cool the workpiece regularly!

### **1.10 Residual risks**

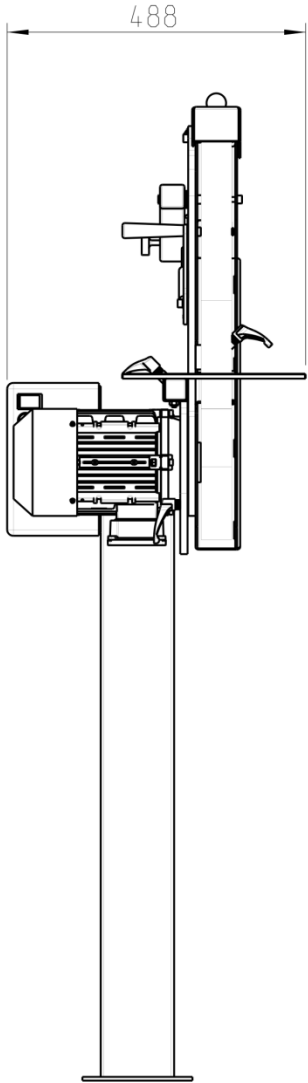
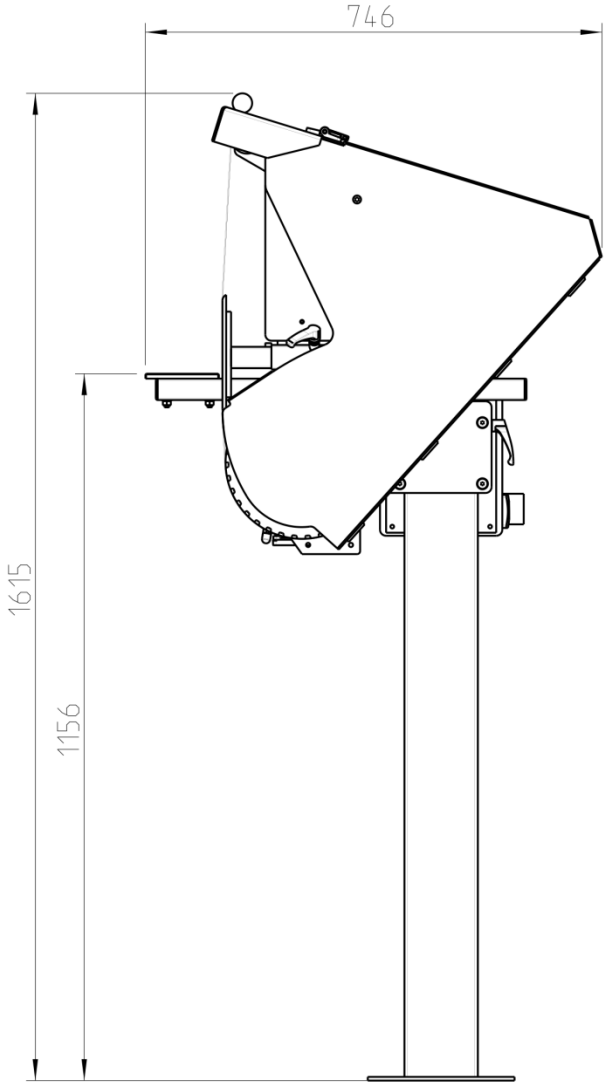
Every machine has residual risks that must be observed for safe operation.

- Risk of injury from hair, jewelry, clothing or parts of the body being trapped between the sanding belt and rollers.
- The running sanding belt can cause injuries and burns if touched!
- Risk of electric shock from touching live parts in the control cabinet!
- Risk of injury from swept away parts and flying sparks!
- Danger of hearing damage from prolonged work without hearing protection!
- Health hazard from dust emissions!
- Risk of injury from incorrectly or insufficiently assembled machine!

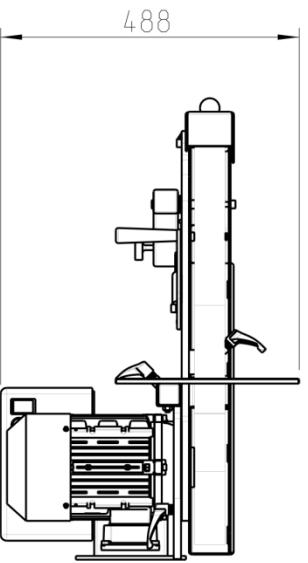
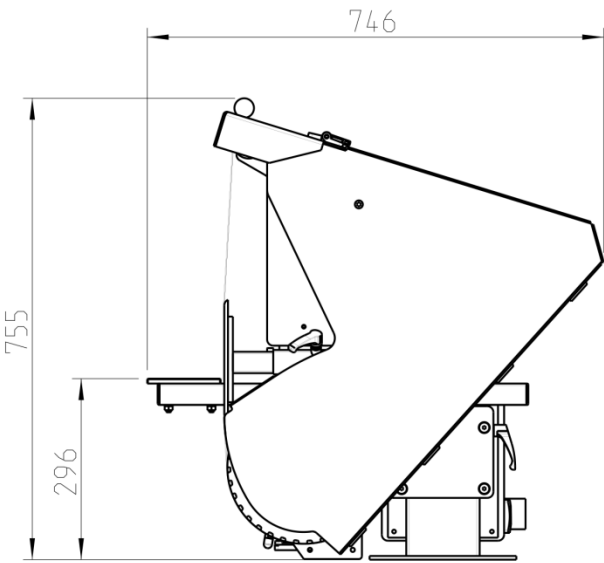
These risks can be minimized if all safety regulations are applied, the machine is properly maintained and cared for and the machine is operated as intended and by appropriately trained specialist personnel.

Despite all safety precautions, common sense and your technical suitability / training to operate a machine is the most important safety factor!

2 Technical data and main measures



Bodenaufbau



Tischmontage

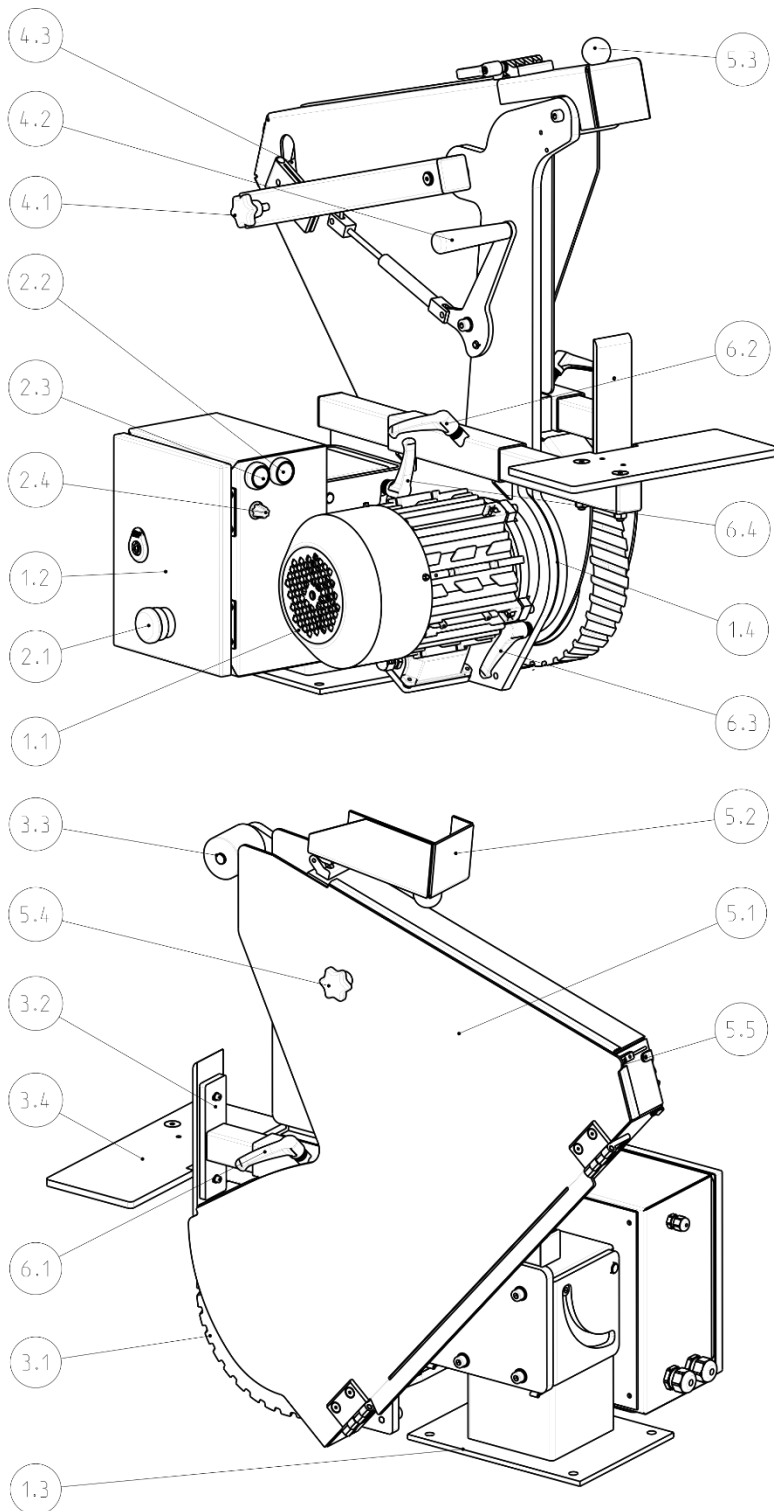
Machine type	Belt grinder
Machine model	BS-1
Electrical connection	230 V, 50 Hz, 7A
Drive system	Three-phase asynchronous motor, 1.5 kW, 400 - 2900 rpm
Grinding belt speed	5 - 28 m/s
Sanding belt dimensions	50 x 2000 mm
Contact wheel diameter	250 mm
Sound pressure level	<90 dB (A)
Main dimensions W x H x D (mm)	488 x 755 x 746 (BS-1 - table mounting variant) 488 x 1615 x 746 (BS-1 - floor mounting variant)
Dimensions	60kg (BS-1 - table mounting variant) 70kg (BS-1 - floor mounting variant)

### 3 Description of the machine and its components

The belt grinder BS-1 is a powerful grinding machine that is suitable for hand-guided grinding of workpieces made of steel, non-ferrous metals, wood and plastics. Depending on the requirements for the grinding result, different work areas are available on the machine, which can be expanded with attachments. The belt sander can be operated with standard fabric sanding belts measuring 50x2000mm. Thanks to the built-in frequency converter, a wide range of speeds can be set for the drive. The use of paper sanding belts is not permitted. Table 1 gives an overview of the most important parts and assemblies of the machine.

The main switch of the machine is designed as an emergency stop. This can be activated at any time in the event of imminent danger and disconnects the motor and frequency converter from the power supply on all poles. The frequency converter initiates the braking of the motor as quickly as possible.

Table 1: Components of the machine



**General**

- 1.1 Drive motor
- 1.2 Control cabinet
- 1.3 Stand with mounting flange
- 1.4 Angle scale

**switch cabinet**

- 2.1 Main switch, emergency stop
- 2.2 Start button (green)
- 2.3 Stop button (red)
- 2.4 Speed controller

**Grinding areas**

- 3.1 Contact wheel
- 3.2 Surface grinding plate
- 3.3 Top roll
- 3.4 Grinding table

**Tension arm**

- 4.1 Tracking screw
- 4.2 Tensioner handle
- 4.3 Tensioner pulley

**Disguise**

- 5.1 Side door
- 5.2 Splash guard
- 5.3 Grab handle
- 5.4 Side door screw
- 5.5 Door switch

**Clamps**

- 6.1 Clamp for grinding attachment
- 6.2 Clamp for Guiding attachment
- 6.3 Clamp of the grinding arm (angle adjustment)
- 6.4 Clamp of the tilt mechanism



## 4 Setup

Before setting up the machine, familiarize yourself with the machine parts that were named in Chapter 3!

Depending on the mount version, the setup plans are shown in illustration 1.

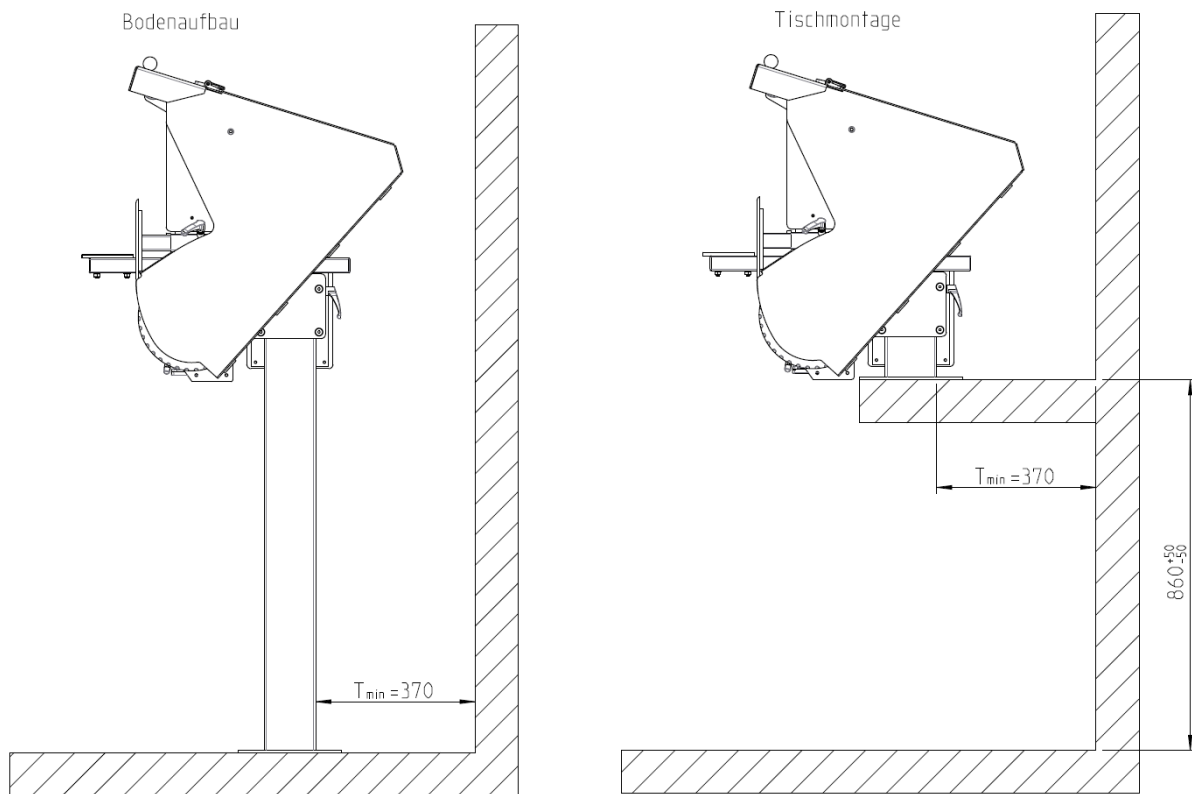


Illustration 1: Floor plans

The following points must be observed when setting up the machine:

1. The installation surface of the machine must be horizontal, level, firm and resistant to flying sparks and increased temperatures!
2. Regardless of the basic version, the machine must be fixed with suitable fastening material and at all prepared fastening points of the fastening flange!
3. Installation in the open air is not permitted.
4. The rear minimum distance  $T_{min}$  shown in the setup plan guarantees that the full swivel range of the machine can be used without contact with walls or other objects. For the full functionality of the machine this distance must not undercut this value.  $T_{min}$  is measured starting from the rear surface of the stand.
5. For safety reasons and in order to be able to use the machine optimally, a distance of 1 meter to walls or other objects must be maintained in front of and to the side of the machine!
6. Make sure that no inflammable substances are stored in the same room within a 5m radius around the machine. Risk of fire from flying sparks!
7. For table mounting, it is advisable to have the front edge of the mounting flange flush with the table edge, as this provides the greatest flexibility with regard to additional attachments.
8. Before connecting and disconnecting the machine to / from the mains, always make sure that the main switch is switched off.

## 5 Usage

**ATTENTION:** Before using the machine, familiarize yourself with the machine parts that were named in Chapter 3!

### 5.1 Installin and removing the sanding belt

1. Switch off the main switch (> 2.1 in Table 1) of the machine by pressing it.
2. Fold the splash guard (> 5.2) into the rear position.
3. Loosen the side door (> 5.1) by loosening the screw (> 5.4) and fold the door down. Note that the folded down door must not be loaded!
4. Pull the tensioning handle (> 4.2) forward to lower the tensioning arm.
5. Place the sanding belt on the top roll (> 3.3), tensioning pulley (> 4.3) and contact wheel (> 3.1). Note any given running direction of the sanding belt.
6. The belt is tensioned by pushing the tensioning handle backwards.
7. Check the belt run by turning the contact wheel by hand in the machine's turning direction. Make sure that no foreign objects or incorrect settings block the sanding belt. Use the tracking screw (> 4.1) to readjust the belt position if necessary.
8. Close the side door and screw it on completely.
9. Fold the splash guard into the front position.
10. Turn the main switch on again by turning the red button and pulling the switch.
11. To remove a sanding belt, proceed in reverse order.

**CAUTION!** Never use the belt sander without the side door completely closed and screwed on!

### 5.2 Start the grinding machine

1. Check that the sanding belt is correctly positioned and that no foreign bodies are in contact with moving machine parts
2. Turn the main switch (> 2.1) to switch on and pull it out.
3. Wait 5 seconds
4. Start the machine with the start button (> 2.2).
5. The belt speed can be changed continuously with the speed controller (> 2.4).

### 5.3 Stop the grinding machine

1. Switch off the machine with the stop button (> 2.3).
2. Note that the machine continues to run for a few seconds and that it poses the same dangers as a switched on machine until it comes to a complete standstill!

### 5.4 Fine adjustment of the belt position

The belt position can be adjusted during operation by turning the tracking screw. This means that the belt can be moved approx. +/- 5mm from the center position. Turning the tracking screw clockwise: the belt moves to the left. Turning the tracking screw counterclockwise: the belt moves to the right.

## 5.5 Use of the grinding areas

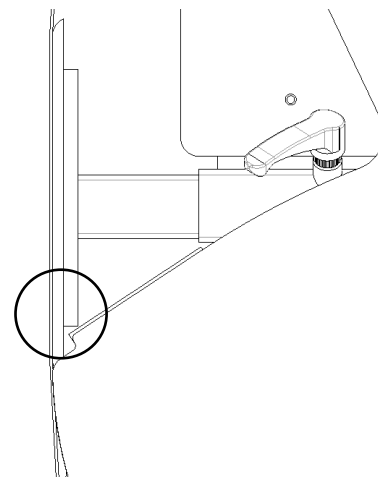
1. Grinding on the contact wheel: For large material removal and for producing hollow grindings
2. Grinding on the flat grinding plate: For producing flat surfaces and for processing contours and angled surfaces when using the grinding table.
3. Grinding on the upper roller (after opening the splash guard): For sanding of small radii.

**CAUTION!** Only open the splash guard for the time the upper roller is being used. Note that increased flying sparks can be expected during this time.

## 5.6 Assembly of the flat grinding plate

**CAUTION!** Make the following settings only when the machine is switched off!

1. The flat grinding plate can only be mounted if no grinding belt is stretched on the machine.
2. Push the flat grinding plate with its arm into the clamping tube provided for it (> 6.1). Observe the illustration for the correct mounting position. The flat grinding plate should be pushed in so far that the grinding surface is flush with the nose of the guard door.
3. Clamp the flat grinding plate with the clamping lever.
4. Continue with the application of the sanding belt.



## 5.7 Using the flat grinding plate

**CAUTION!** Make the following settings only when the machine is switched off!

1. First set the desired angle of the grinding arm (see next page)
2. Place the grinding table in the clamping tube provided for it (> 6.2), as shown in Table 1.
3. Adjust the position of the grinding table so that there is an air gap of approx. 1mm to the sanding belt. Please note: an air gap that is too small can block the sanding belt! If the air gap is too large, workpieces can be jammed between the sanding belt and sanding table, which can lead to damage or injuries!
4. Clamp the sanding table with the clamp provided for this purpose (> 6.2)

## 5.8 Angle adjustment of the grinding arm

The angle of the grinding arm can be tilted +/- 30 ° from the standard position. The standard position describes the case that the flat grinding plate forms an angle of 90 ° with the grinding table.

**CAUTION!** Make the following settings only when the machine is switched off!

To change the angular position, proceed as follows:

1. To prevent the grinding arm from swiveling through in an uncontrolled manner, grasp it firmly while swiveling! Use the grab handle provided on the splash guard (> 5.3).
2. Loosen the clamping of the grinding arm (> 6.3).
3. The grinding arm can now be freely swiveled and adjusted according to the angle scale (> 1.4).
4. Clamp the grinding arm again.

## 5.9 Using the tilt mechanism

For comfortable grinding of contours (especially with the accessory parts radius grinder and contour table) the grinding arm can be tilted 90 ° into a horizontal position. The tilt mechanism is also used in connection with the precision surface grinding attachment.

**CAUTION!** Make the following settings only when the machine is switched off!

- 1) Make sure that there are no objects within 1 meter to the left and right of the machine that could prevent it from tipping.
- 2) Open the clamp of the tilt mechanism (> 6.4).
- 3) Carefully swivel the belt sander 90 ° to the left.
- 4) Clamp the tilt mechanism.

**CAUTION!** Remember that when the grinding arm is folded down, the flying sparks point in other directions!

## 6 Maintenance and cleaning

In principle, the machine is designed to be low-maintenance. However, the service life depends on the type of application. In particular, using the machine according to this manual and keeping it clean are the prerequisites for a long-lasting machine that delivers the required grinding quality!

Therefore, clean and check the following areas of the machine regularly. Note that this work may only be carried out when the machine is switched off!

- Sanding dust and moisture will collect inside the cladding (especially during wet sanding). Remove this daily with a broom or vacuum cleaner.
- Check the inside of the clamping pipes for dirt and deposits. Contamination at this point can lead to positional errors in the clamped accessories and negatively affect the grinding result.
- Clean the bearings of the rollers from dust and moisture after wet grinding.
- Check the cables weekly for external damage. If necessary, cables must be replaced by a qualified electrician. If in doubt, contact the manufacturer of the machine.

## 7 Equipment

For instructions on the correct use of accessories, please refer to the documents supplied with the accessories. Keep them together with these operating instructions!

The use of any accessories or add-on parts from third parties can lead to personal injury and damage to the machine, for which no liability is assumed. If necessary, consult the manufacturer of the machine!

Please note that any mechanical or electrical modification of the machine will void the CE marking and warranty!

## 8 Troubleshooting

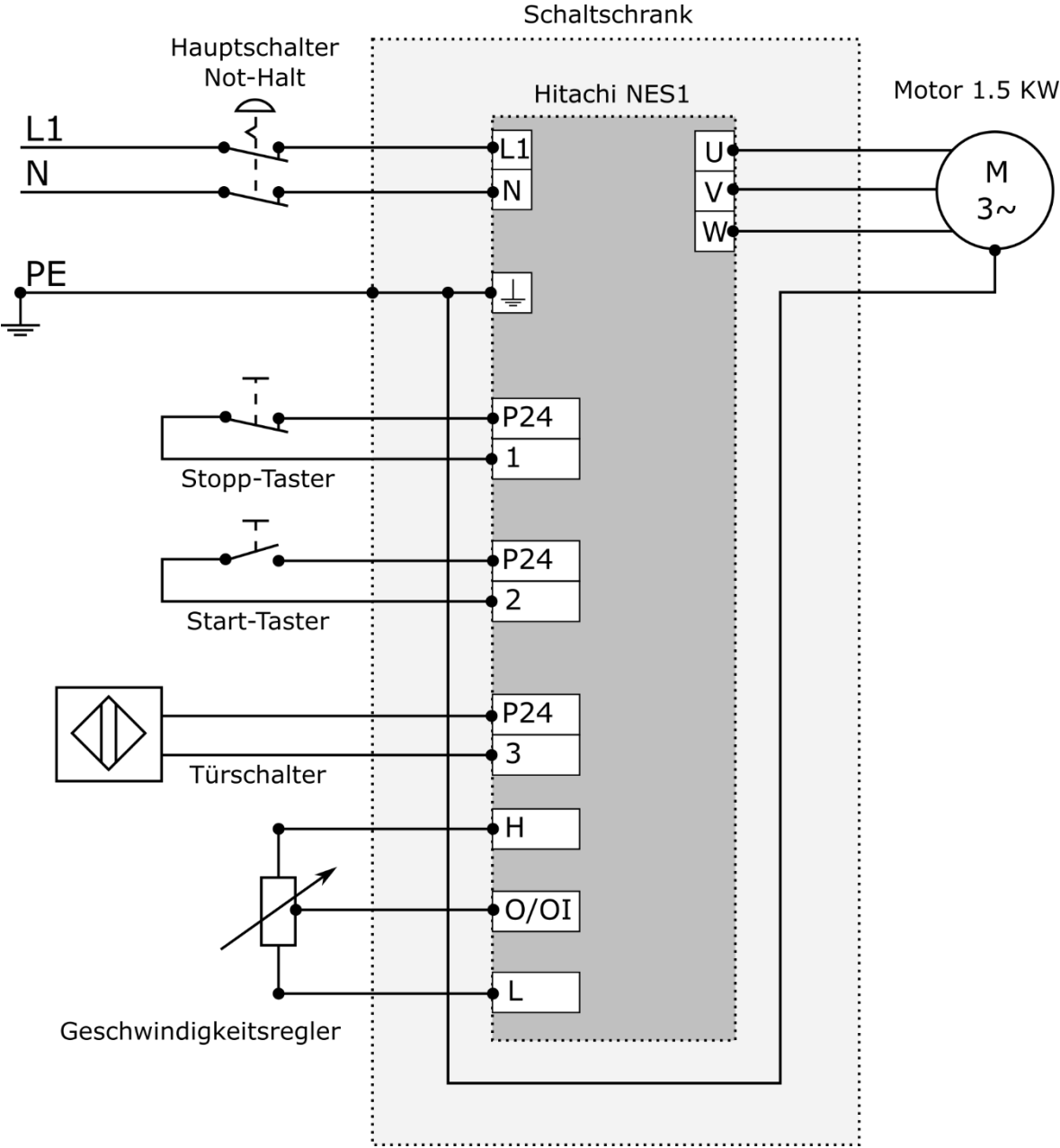
**The following always applies: In the event of malfunctions that could pose an immediate danger to people, property or operational safety, stop the machine immediately using the main switch (= emergency stop) and disconnect it from the power supply.** Only then try to analyze the problem and, if necessary, contact the manufacturer of the machine. Do not use the machine again until the fault has been rectified.

Mechanical disturbances	Reason	Solution
The grinding arm gives way when pressure is applied	Clamping arm tightened too weakly	Move the clamping lever of the sanding arm to a more favorable angular position and tighten it more
Unstable belt tracking	Belt tension not applied	Check the position of the clamping lever
	Belt tension too small	Replace gas pressure spring
	Belt worn / stretched	Replace belt
	Tensioning pulley worn out	Replace tension pulley
	Tracking screw set incorrectly	Readjust screw
Running noises	Clamps loose	Tighten clamps
	Loose parts touch the machine	Remove parts
	Ball bearing defective	Replace the bearings in question
	Motor fan rubs against the housing	Fix fan, check housing for deformation
Vibrations	Formation of resonance	Change the speed slightly
	Strong vibrations	Check contact wheel and rollers for damage, check accessories for imbalance

Strong warming	... of the rolls  ... of the motor  ... the surface grinding plate	Replace ball bearings  Allow the motor to cool down after a long working period at low speed and high load.  Safe (<80 ° C). However, watch out for the risk of fire!
<b>Electrical disturbances</b>	<b>Reason</b>	<b>Solution</b>
Machine does not start	Safety switch does not close (status LED on the switch does not light up with closed door)  Input voltage missing  Restart protection active (The machine does not start if the start button is pressed before the main switch is on)  Inverter error  Motor failure	Check correct assembly of the side door replace safety switch if necessary  Check connector and cable Check fuses  After switching on the main switch, wait approx. 5s before starting the machine.  Contact the manufacturer / replace inverter  Contact the manufacturer / replace motor
Machine stops while working	Overcurrent  Overtemperature	Load the machine less heavily. Operation above the performance limit is indicated by a sharp drop in speed while working.  Shut down the machine, let the motor / inverter cool down
The speed cannot be regulated or is erratic	Potentiometer dirty / corroded	Contact the manufacturer / replace potentiometer

If errors other than those described here occur, please contact the manufacturer! Do not open the control cabinet in the event of electrical faults, there is a risk of death from electric shock! Maintenance on electrical components may only be carried out by qualified specialists!

# 9 Circuit diagram



## 10 Declaration of conformity

Oliver Tobin

Wallnerstrasse 8

3004 Ollern Austria

hereby declares that the machine

**Belt grinder type BS-1**

complies with the following European directives:

**MACHINE DIRECTIVE: 2006/42 / EC**

**LOW VOLTAGE DIRECTIVE: 2014/35 / EU**

**DIRECTIVE ON ELECTROMAGNETIC COMPATIBILITY: 2014/30 / EU**

Ollern, January 25th, 2021



Oliver Tobin