

INSTRUCTION MANUAL
for
HANDHELD SLOT MILLING MACHINE

CONTENTS

1. Introduction.....	2
2. Safety instructions.....	4
2.1. General safety instructions.....	4
2.2. Misuse.....	4
2.3. Remaining safety risks.....	6
2.4. Safeguarding.....	6
3. Preparation for work.....	8
3.1. Using the machine.....	8
3.2. Cutting Tools.....	9
4. Sequence of operation.....	11
4.1. Safety during operation.....	11
4.2. Milling of a slot.....	11
5. Parameter measurement, adjustment, and set-up.....	13
5.1. General recommendations and safety.....	13
5.2. Adjusting the horizontal position of the router.....	13
5.3. Adjusting the vertical position of the router.....	13
5.4. Changing the tool.....	14
5.5. Set-up for milling of a slot.....	14

ORIGINAL INSTRUCTION MANUAL

This instruction manual is issued by the manufacturer STOA Ltd., 3A, Ivan Borimechkata St., 1756 Sofia, Bulgaria, Tel.: +359 2 9744888, Fax: +359 2 9746279, <https://www.bilda.net>

1. INTRODUCTION

Thank you for choosing our product. To get the maximum performance out of your handheld slot milling machine (referred in this manual also as “the machine”) and get to know the safety and technical aspects of its operation, a careful study of this manual is imperative.

The handheld slot milling machine is assembled with moving and electrical parts. Misuse or non-observance of the safety instructions may have serious consequences for the operator and their health and could result in injury.

This manual provides information concerning use and safety related to the machine’s operation.

By following the instructions laid out in this manual, operators will be able to use the machine properly and prolong its life.

The manufacturer does not bear responsibility for the incorrect assembly, adjustment or use of the machine.

Table 1.1. Technical data

TECHNICAL DATA	
Year of production	
Power supply	220 V/5 A ~50/60 Hz
Normal working ambient temperature	max. < 35°C min. > 0°C
No load speed of the routers	from 5000 min ⁻¹ to 25 000 min ⁻¹
Power rating of the router	1050 W
Power rating of the water pump	25 W
Net weight	
Cutting disc diameter	max. 70 mm min. 40 mm
Power cord length	5 m
Variable speed	Yes
Collet capacity	ER16 collet Ø6 mm, Ø8 mm
Thickness of the machined panel	max. 60 mm min. 8 mm
Slot thickness	max. 10 mm min. 2 mm

2. SAFETY INSTRUCTIONS

2.1. General safety instructions

Read all safety warnings and all instructions.

Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

Keep work area clean and well lit.

Do not operate the machine in the presence of flammable liquids, gases or dust.

Do not work materials containing asbestos.

Keep bystanders away and do not be distracted or talk to others while operating the machine.

Stay alert, watch what you are doing, and use common sense when operating the machine. Do not operate the machine while you are tired or under the influence of drugs, alcohol or medication.

Keep proper footing and balance at all times.

Never use the machine with damaged cable. Do not touch the damaged cable and pull the mains plug when the cable gets damaged during operation.

When operating the machine outdoors use an extension cord suitable for outdoor use.

2.2. Misuse

Use the machine only for making slots in cladding panels made of ceramics, granite, marble, limestone, concrete, HPL or ACP.

Use the machine, accessories, and cutting tools etc. in accordance with these instructions and in the manner intended for the particular machine, taking into account the working conditions and the work to be performed.

Misuse or non-observance of the safety instructions may have serious health consequences for the operator or people standing nearby, and could result in serious injury.

Do not make any changes to the machine, as these changes may lead to new safety risks.

Make sure that the conditions specified on the information plate of the machine, such as ambient temperature and electrical data are observed.

Do not expose the machine to rain or working conditions that will lead to water entering the electrical motor casing.

The router holders are designed for carrying the routers, providing support for the cooling system, and attachment for the plastic curtains. Do not attach anything else to the router holders that will hinder their functions and lead to safety risk.

The plastic curtains are designed to reduce the water splashes and dust spreading during milling of a slot. Do not operate the machine if the curtains are not properly attached to the router holder.

Do not use the router separately from the machine.

Use of the router for operations different from those they are intended for could result in a hazardous situation.

The diamond cutting tools supplied from the machine manufacturer are intended for use only with the machine.

Do not attach a saw chain woodcarving blade or toothed saw blade.

Use only power supplies that correspond to the power supply stated in the technical data of the machine.

Do not operate the machine without or with empty water tank. Always maintain sufficient water level in the tank.

Do not block the water flow in the tubes of the cooling system in any way.

Do not detach the tubes or any part of the machine while it is running.

The machine's power plug must match the outlet. Never modify the plug in any way.

Do not abuse the power cord. Never use the cord for pulling or unplugging the machine. Keep the power cord away from heat, oil, sharp edges or moving parts.

2.3. Remaining safety risks

Although, all safety principles are integrated in the design of the machine, and additional measures for safety and prevention are present, some safety risks remain.

During the cutting process water is used as a coolant, and also as a mean for removing waste material. This can lead to water puddles forming around the machine, and risk of slipping.

Although, cutting must be carried out with water applied to the cutting area, some dust particles may become air borne and spread near the machine. This creates a risk of inhaling the particles, eye irritation, and skin irritation.

There is a possibility for fine dust settling on equipment that is near the machine.

The machine generates significant noise which creates risks for the hearing of the operator and people standing near the machine.

The cutting tools are rotating at high speeds and access to them is not fully obstructed, this creates the risks of inflicting cut wounds and clothing becoming entangled with the tools, leading to serious injury.

There is a risk of kickback if the cutting tool jams in the work piece.

2.4. Safeguarding

To reduce the risk of slipping always wear non-skid safety shoes.

To reduce the risk of inhaling air borne particles always wear a dust mask.

To reduce the risk of eye irritation and injuries always wear safety glasses.

To reduce the risk of skin irritation wear clothing with long sleeves and long trousers.

To avoid the risk of damaging equipment that is sensitive to dust or water splashes, do not place such equipment near the machine.

To reduce the risk for hearing impairment always wear hearing protection.

To reduce risk of injuries inflicted from the rotating cutting discs, do not wear loose clothing, jewelry or long hair, and never touch or reach over, around, or near the tool, when it is rotating.

To reduce the risk of kickback due to jamming of the cutting disc in the cladding panel, apply the disc to the work piece only when the router is switched on and the disc has reached its currently set rotational speed.

Although this information and the instruction manual for our machine contain extensive instructions on safe working with the machine, every electrical machine involves certain residual risks that cannot be completely prevented through safety mechanisms. Therefore, electrical machines must always be operated with the necessary caution.

3. PREPARATION FOR WORK

3.1. Using the machine

The machine must only be operated, maintained and serviced by authorized trained personnel. The personnel must be made aware of the relevant dangers.

The instructions laid out in this manual must be observed.

The machine operator must be thoroughly familiar with the machine before operating it. The operator also must be familiar with the contents of this manual and be able to act accordingly during machine operation.

Do not allow persons unfamiliar with the machine or these instructions to operate the machine.

Before start using the machine ensure that the working area is clean and well lit.

Use safety equipment. Always wear eye and hearing protection.

Remove any adjusting key or wrench before turning the machine on.

Do not use the machine if the ON/OFF switch do not function as expected.

Maintain the machine. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the machine's operation. If damaged, have the machine repaired before work.

Keep cutting tools sharp and clean.

Observe correct main voltage.

Before work, you have to find an appropriate place to accommodate the cladding panels you want to process. The best solution is to use a mason's table with the necessary drainage.

You also have to provide a separate tank (vessel) with water for the cooling system.

Test the electric router and the cooling water system before milling.

3.2. Cutting Tools

Always make sure that the cutting tool is sharp before using it for the intended processing operation.

Do not use blunt or damaged router bits. Blunt or damaged cutting tools cause increased friction, can become jammed and lead to imbalance.

The rated rotational speed and peripheral speed of cutting tools must be at least equal to the maximum speed of the router, otherwise cutting tools may break apart and cause severe injuries.

When using cutting tools, always observe the information provided by the tool manufacturer.

Table 3.1 lists the appropriate tool sizes and speeds for milling of slots in cladding panels made of different materials. To set the router to the appropriate speed setting use the speed selection dial located at the top of the router. Bear in mind that the recommended peripheral cutting speeds for the materials listed are tentative.

Table 3.1. Cutting speed settings

Cutting tool diameter	40 mm	50 mm	60 mm	70 mm
Material (peripheral speed)				
Ceramics (20 m/s)	2, 3	2 (best)	2	1
Hard granite (23 m/s)	3	2, 3	2 (best)	1, 2
Granite (30 m/s)	4	3	2, 3	2 (best)
Marble (40 m/s)	5	4	3 (best)	3
Limestone (50 m/s)	6 (good)	5	4 (best)	3
Concrete (60 m/s)	6	5, 6	5	4 (best)

Never exceed the permissible peripheral speed for the currently used tool!

For assessing this requirement use Table 3.2 in which are given the calculated peripheral speeds for the different speed settings of the routers, and possible combinations of tool diameters.

Table 3.2. Calculated peripheral speed in m/s for different cutting tool diameters and rotational speed settings

Speed setting (rev/min)	1 (5000)	2 (7700)	3 (12500)	4 (16500)	5 (21000)	6 (25000)
Tool diameter, mm						
40	10,5	16,1	26,2	34,6	44,0	52,4
50	13,1	20,2	32,7	43,2	55,0	65,4
60	15,7	24,2	39,3	51,8	66,0	78,5
70	18,3	28,2	45,8	60,5	77,0	91,6

4. SEQUENCE OF OPERATION

4.1. Safety during operation

Wear non-skid safety shoes with steel toe, dust protection mask, safety glasses, hearing protection, and do not wear loose clothing.

Do not force the router. Use the correct combination of speed setting and cutting tool. If the tool does not cut properly or there are increased vibrations, stop the process and properly adjust the settings or replace the tool.

Do not use the machine if the ON/OFF switch do not work as expected.

Always ensure that the mains and extension cable are away from rotating parts.

If the mains cable is damaged while working, pull the mains plug immediately. Damaged mains cables must not be used. They must be replaced immediately by an expert technician.

The router is equipped with a soft starter. The starting current limitation reduces the starting current. The motor revs up slowly until it reaches the preselected rotational speed.

The router is equipped with electronic overload protection. With a load that is too high, which therefore implies a risk for the motor, the rotational speed of the milling motor is reduced by the integrated monitoring of the motor. The router must be released (preferably remove the workpiece a short distance from the router) to ensure that you have full capacity again.

The router runs a short time after it is switched off.

Keep your hands away from the cutting area and cutting tools.

Apply the router to the workpiece only when switched on.

4.2. Milling of a slot

Make sure that the machine is properly set-up for milling of a slot (refer to section "Parameter measurement, adjustment, and set-up" for instructions).

Place the cladding panel onto the work table with the face **up**.

Depending on the material that will be machined select the speed of the routers using the setting dial (refer to Table 3.1 from section “Preparation for work”).

Adjust the vertical position of the routers to the desired location for the slots (refer to section “Parameter measurement, adjustment, and set-up” for instructions). The vertical position of the slots should always be determined with regard to the face of the cladding panel. The cladding panels should be placed and processed with the face **up**.

Adjust the horizontal position of the router to the desired location for the slot (refer to section “Parameter measurement, adjustment, and set-up” for instructions).

Remove any adjusting key or wrench before turning the machine on.

Connect the machine and water pump to appropriate power supply.

Make sure that the ON/OFF switch of the router is in ON position. The switch can be locked in the ON position so there is no need to hold it continuously during operation.

Wait a few seconds until the router have reached the set rotational speed.

Place the machine’s base plate on the face of the cladding panel without touching the panel with the cutting tool.

Feed the router’s rotating cutting tool to the cladding panel by sliding the base plate over the face of the cladding panel. Always maintain contact between the base plate and the face of the panel during machining.

Maintain a straight line feed by tracing the cladding panel’s edge with the guiding ruler. The guiding ruler must be parallel to the cladding panel’s edge during cutting for the slot to be made with the correct shape and position.

Observe the quantity of cooling water; if there is too little water in the tank, stop milling, clean the cutting tool and pour water in the tank to fill it in.

Repeat the procedure for milling slots in subsequent cladding panels.

After finishing work, turn off the machine using the ON/OFF switch, and unplug the machine from the electric power supply. Clean the machine and tidy the workplace.

5. PARAMETER MEASUREMENT, ADJUSTMENT, AND SET-UP

5.1. General recommendations and safety

Disconnect the plug from the power source before making any adjustments, changing tools or accessories, or storing the machine!

5.2. Adjusting the horizontal position of the router

The router is attached to a router holder. The router holder is equipped with handles with which the operator carries and guides the machine.

The operator manually positions the router horizontally, thus determining the position of the machined slot.

For the precise determination (and guiding during machining) of the horizontal position of the machined slot relative to the cladding panel's edge a guiding ruler is used. Two guiding rulers are attached to rods assembled with the machine's base plate.

The rulers are located on the left and right side of the base plate, and are used for guiding the machine in a straight line feed and also maintaining correct horizontal positioning relative to the cladding panel's edge.

The rulers' position can be adjusted along the rods.

The rulers are used in combination with the middle marking on the base plate so, that the distance from the middle marking to the ruler is the distance at which the slot will be machined relative to the cladding panel's edge.

5.3. Adjusting the vertical position of the router

The vertical position of the router determines the location of the slot relative to the face of the cladding panel.

The vertical position of the router is adjusted by moving vertically the top plate of the router holder along the vertical guide rods. To enable movement of the top plate unscrew the clamping stud by using the star shaped knob to the right of the router.

Slide up or down the top plate to adjust the vertical position of the router.

After adjustment tighten the clamping stud using the star shaped knob in order to lock the top plate into position.

5.4. Changing the tool

The spindle of the router is equipped with a precision collet chuck to hold the tools. A spindle lock enables you to tighten and loosen the locknut.

To clamp the tool, you lock the spindle by pressing the locking button.

You tighten the locknut using SW 17 open-ended spanner.

When you unclamp the tool, the spindle in turn is locked.

You loosen the locknut by turning the open ended spanner. You can remove the tool by continually turning the open-ended spanner.

After you use the insertion tool, perform a test run with an over-speed and make sure that no one is within reach of the rotating insertion tool. Damaged tools usually break in this test period.

5.5. Set-up for milling of a slot

1. Make sure that the router is in the router holder and the set screw securing it is sufficiently tightened. The set screw is located at the front of the top plate.
2. Connect the water tube to the water tank.
3. Choose the appropriate cutting tool (refer to section "Preparation for work" for instructions) for the required width and size of the slot and fix it into the collet.
4. Make sure the end of the cooling water tube is inserted into the appropriate hole so that the cooling water pours over the periphery of the tool.