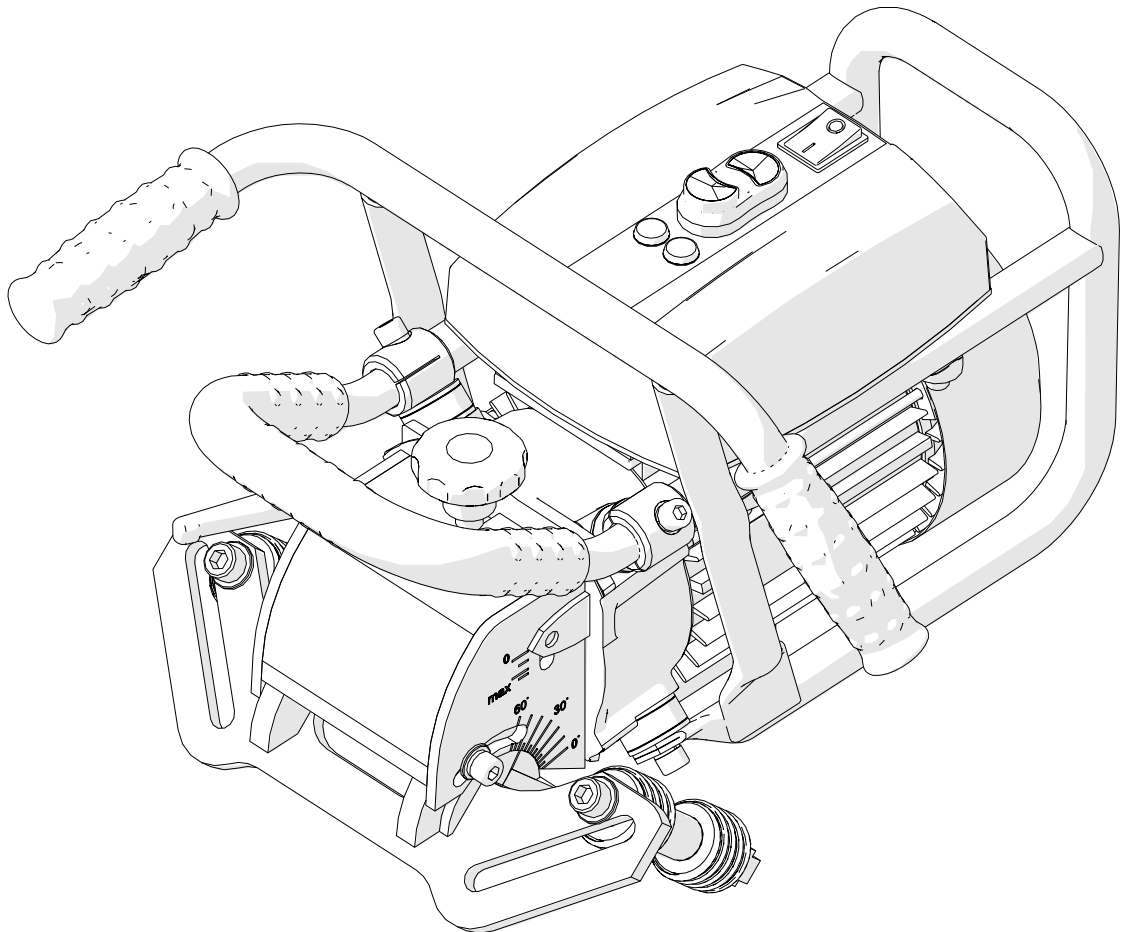




## OPERATOR'S MANUAL

# SM-BM-21

## BEVELING MACHINE



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# 1. GENERAL INFORMATION

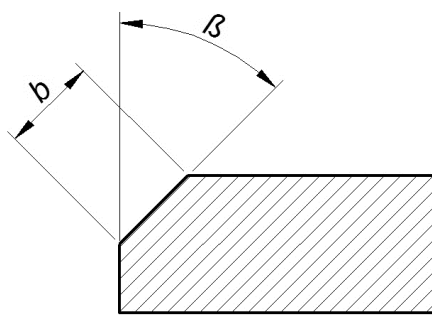
## 1.1. Application

The BM-21 Beveling Machine is designed for milling edges of plates and pipes made of carbon steel. The machine allows for beveling sheet edges as well as pipe edges of diameters from 150 mm (6") to 300 mm (12") at the angle of 0 to 60° and with maximum bevel width of 21 mm (13/16").

When equipped with an optional guide, it can also work on pipes with diameters above 300 mm (12"). Additionally, the machine contains dampers, which reduce vibrations.

## 1.2. Technical data

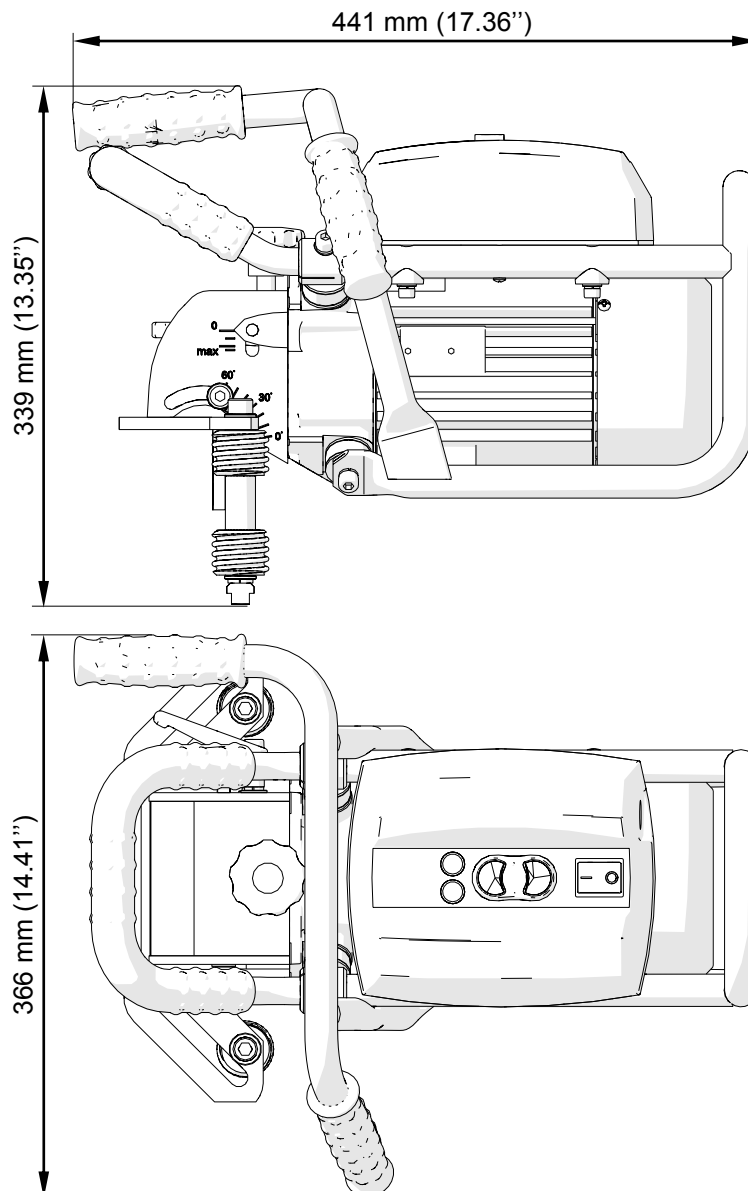
Voltage	~ 220–240 V, 50–60 Hz ~ 110–120 V, 50–60 Hz
Power	1600 W (for 50 Hz) 1800 W (for 60 Hz)
Rotational speed	2780–3340 rpm (at 230 V) 2740–3290 rpm (at 115 V)
Protection level	IP 20
Protection class	I
Milling speed	550 m/min (1800 ft/min, for 50 Hz) 650 m/min (2200 ft/min, for 60 Hz)
Maximum bevel width	$b \approx 21 \text{ mm}$ (13/16", Figure 1)
Bevel angle range	$0^\circ \leq \beta \leq 60^\circ$ (Figure 1)
Weight	Approx. 23 kg (51 lbs)



**Figure 1.** Bevel dimensions

$\beta$	0°	30°	45°	60°
$b$	21 mm	18.5 mm	21 mm	18.5 mm

**Table 1.** Maximum bevel width depending on the angle



### 1.3. Equipment included

The BM-21 Beveling Machine is supplied in a metal box with complete standard equipment. The included equipment consists of:

- beveling machine with a set of cutting inserts – 1 unit
- metal box – 1 unit
- 8 mm hex wrench – 1 unit
- 6 mm hex wrench – 1 unit
- 4 mm hex wrench – 1 unit
- 12 mm flat wrench – 1 unit
- torx screwdriver – 1 unit
- Operator's Manual – 1 unit

## 2. SAFETY PRECAUTIONS

1. Before starting, read this Operator's Manual and complete proper occupational safety and health training.
2. Machine must be used only in applications specified in this Operator's Manual.
3. Machine must be complete and all parts must be genuine and fully operational.
4. Power supply specifications must conform to those specified on rating plate.
5. Power supply socket must be equipped with grounding pin.
6. Never carry machine by cord or yank it to disconnect plug from socket. It can cause power cord to break and result in electric shock.
7. Untrained bystanders must not be present near machine.
8. Before starting, check condition of machine and electrical installation, including power cord, plug, control panel components, and milling tools.
9. Keep machine dry. Exposing it to rain, snow, or frost is prohibited.
10. Keep work area well lit, clean, and free of obstacles.
11. Never use machine near flammable fluids or gases, nor in explosive environments.
12. Never use dull or damaged tools.
13. Use only tools recommended by manufacturer and specified in Operator's Manual.
14. Mount cutting inserts and milling head securely. Remove adjusting keys and wrenches from work area before connecting plug to power socket.
15. If cutting edge of insert is worn out, rotate insert in socket by 90° or, if all edges are worn out, replace with new insert specified in Operator's Manual. Always replace or rotate all inserts at the same time.
16. Before every use, inspect machine to ensure it is not damaged. Check whether any part is cracked or improperly fitted. Make sure to maintain proper conditions that may affect machine operation.
17. Always use eye and hearing protection, non-skid footwear, gloves, and protective clothing during operation. Do not wear loose clothing.
18. Do not touch moving parts or metal chips formed during milling. Prevent objects from being caught in moving parts.
19. After every use, remove metal chips from machine, particularly from milling head. Never remove metal chips with bare hands.
20. Maintain machine and tools with care. Cover steel parts with thin grease layer to protect them against rust when not in use for a longer period.

21. Perform maintenance and tools replacements only with power cord unplugged from power socket.
22. Perform repairs only in service center appointed by seller.
23. If machine falls on hard surface, from height, is wet, or has other damage that could affect technical state of machine, stop operation and immediately send machine to service center for inspection and repair.

### 3. STARTUP AND OPERATION



All safety precautions must be closely observed.

#### 3.1. Adjustment of bevel width and angle

Before starting, set required bevel width and angle. First, with power cord unplugged from power socket, set the milling head penetration to zero. To do this, loosen the lever (Figure 2) and rotate the adjusting knob to decrease the penetration of the milling head into the workpiece by setting the indication “0” on the width pitch.

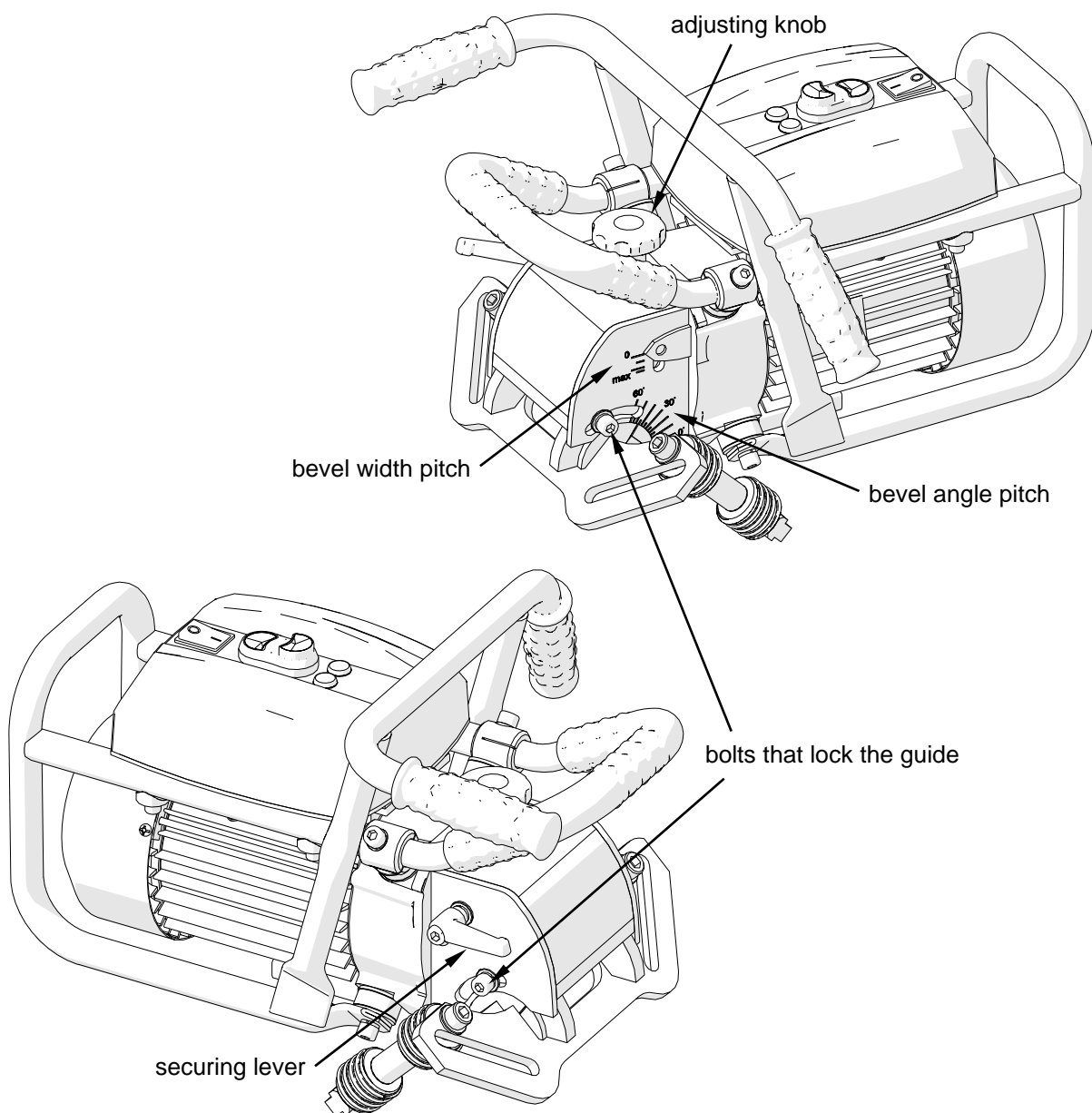


Figure 2. Adjustment of bevel width and angle

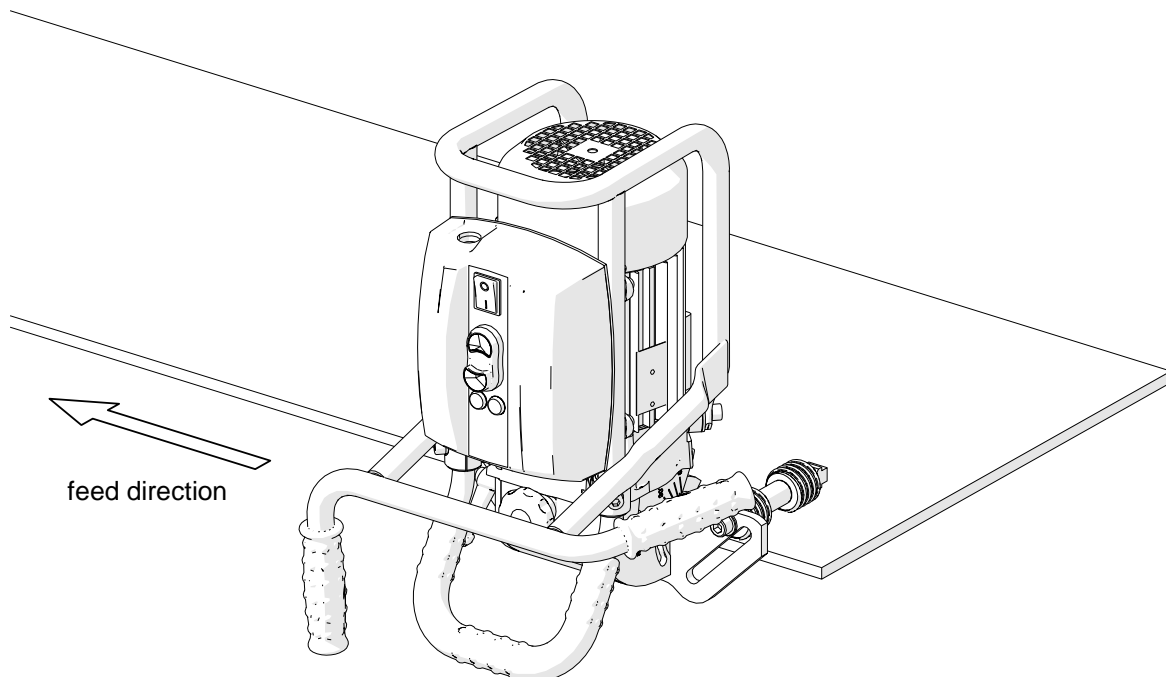


To change the angle of the bevel, use the supplied 6 mm hex wrench to loosen two side bolts. Then, turn the guide in a way to set the required angle on the angle pitch and tighten the bolts afterward.

To adjust the bevel width, use the adjusting knob, proceeding as described before. The width pitch is only an estimate, because the bevel width varies with angle. For example, for the angle of  $10^\circ$  the maximum width “b” (Figure 1) is approximately equal 18 mm (11/16”), while the width pitch indicates 9 mm (6/16”). Increasing the penetration at this angle will distort the bevel. You can obtain the maximum bevel width ( $b \approx 21$  mm, 13/16”) for the angle of  $45^\circ$ . The demanded bevel width for the required angle must be determined experimentally by gradually increasing the milling head penetration into the workpiece.

### 3.2. Usage

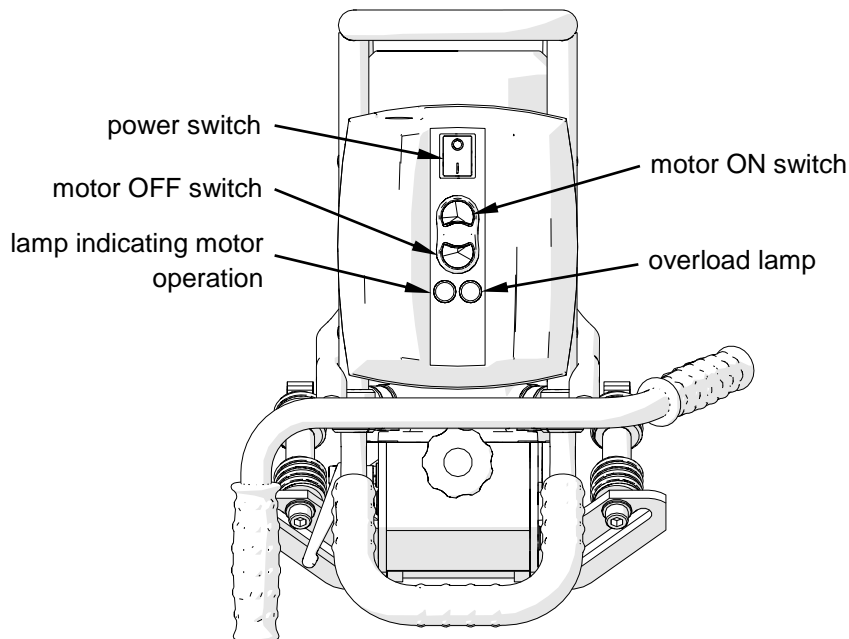
After setting the bevel width and angle, plug the machine into the grounded power socket. Then, place the machine vertically on the right side of the workpiece as shown in Figure 3 in a way that the milling head does not touch the working edge.



**Figure 3.** Machine prepared for work on metal plates

Turn on the power, which will illuminate the power switch (Figure 4). Then, turn on the motor using the motor ON switch, press the guide to the plate, and slowly move the machine close to the edge. Bevel by sliding the machine to the left. Beveling is performed according to the counter-rotation. The proper feed direction is

shown in Figure 3. The direction of the milling head rotation is indicated on the motor disk under the milling head cover.



**Figure 4.** Control panel design

The feed rate will depend on the profile and composition of the workpiece. You can bevel the majority of steels capable of being welded in just one pass.

It is recommended that bevels wider than 12 mm (1/2") be accomplished in at least two or three passes. In this case you use less effort and the process takes less total time than for beveling in single pass.

To obtain the maximum bevel width (21 mm, 13/16") in two passes, the first pass should be 14 mm wide (9/16"), whereas for three passes the first one should be 12 mm wide (1/2") and the second one 16 mm wide (5/8").

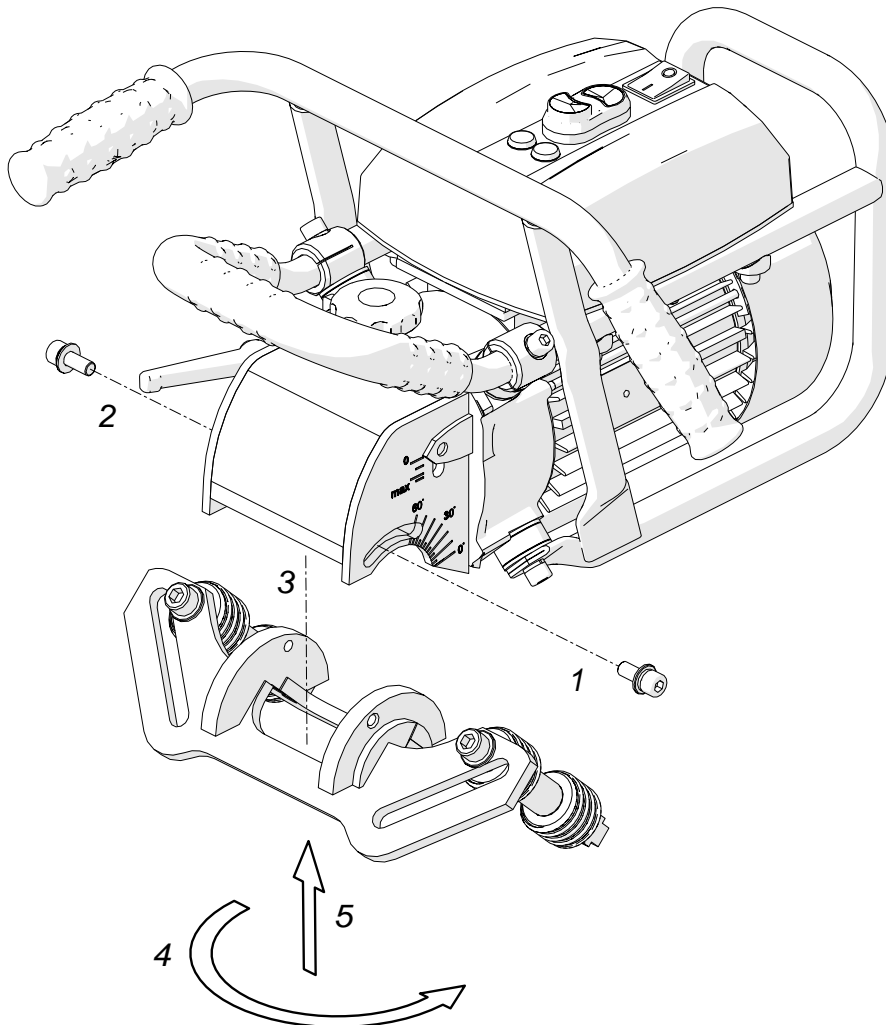
If the feed is too fast, the red overload lamp illuminates, indicating motor overload. Further increasing of the load will trigger the safety circuit and shut down the motor. In this case, move the tool away from the beveled edge, toggle power switch to position "0", and after the red lamp turns off, turn on the power again. Operating with the maximum permitted load (flashing of the red lamp) is allowed, but the motor temperature must not exceed 85°C (185°F). This type of motor can work under high temperatures, but long-lasting overheating can permanently damage motor windings. Therefore, after longer working under full load (maximum 1 hour), stop the motor to cool it down for 10–15 minutes. Do not cool down the motor by running it without load, because it will become heated even faster than when working with load.

Once the work is finished, press the motor OFF switch to stop the motor, and toggle the power switch to position “0” to turn off the power.

### 3.3. Beveling of pipes

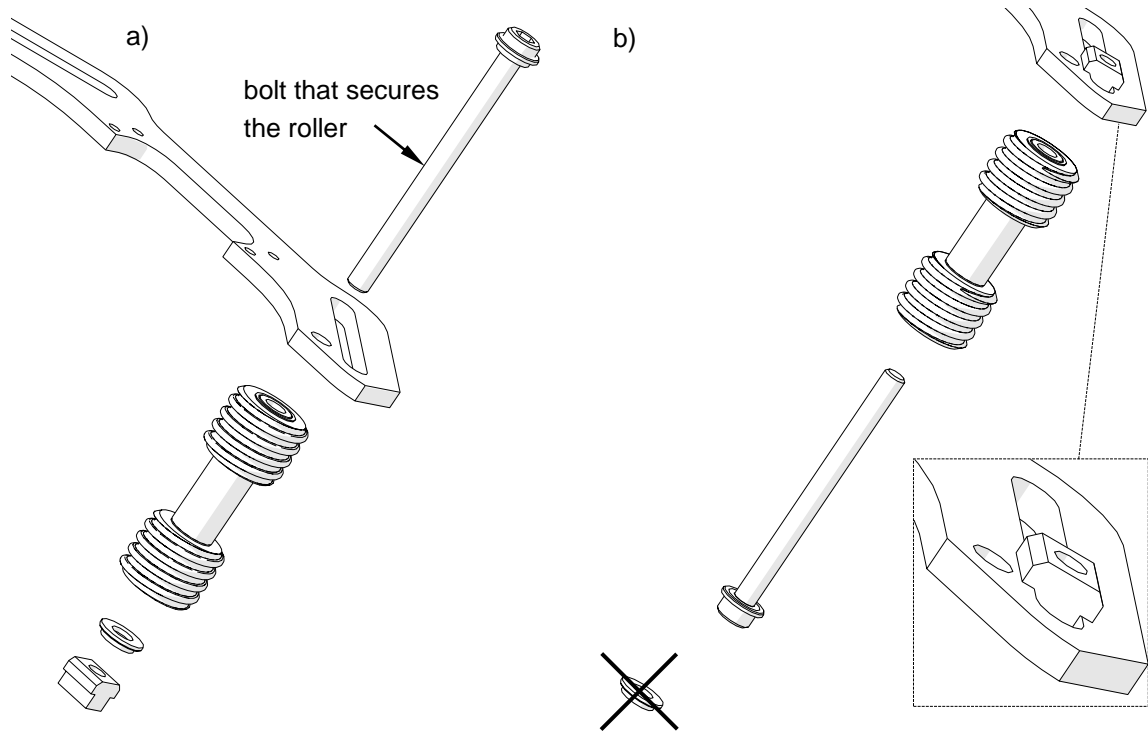
The guide with rollers supplied in standard equipment allows for beveling pipes with diameters of 150–300 mm (6–12”).

To prepare the machine for work on pipes, use the supplied 6 mm hex wrench to unscrew two bolts that lock the guide (Figure 5). Then, take out the guide set, rotate it by 180° around the vertical axis, mount again, and secure with the bolts.



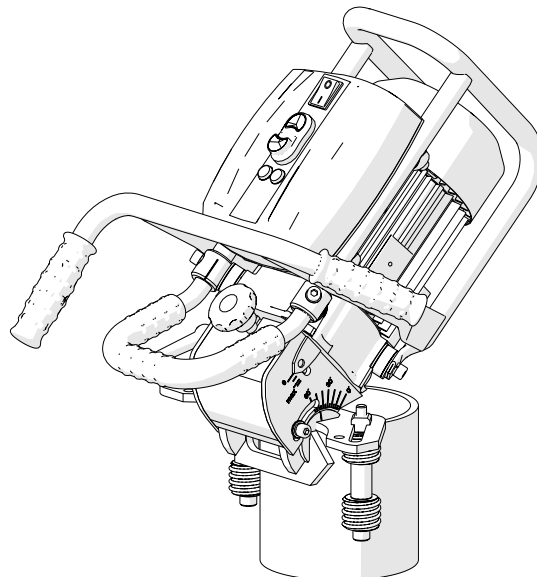
**Figure 5.** Preparing the machine for work on pipes

Use the supplied 8 mm hex wrench and 12 mm flat wrench to unscrew the bolts that secure the rollers. Then, move rollers from the opening (Figure 6a) to the slot (Figure 6b) by placing the T-nut into the slot.



**Figure 6.** Method of moving the rollers from opening to slot

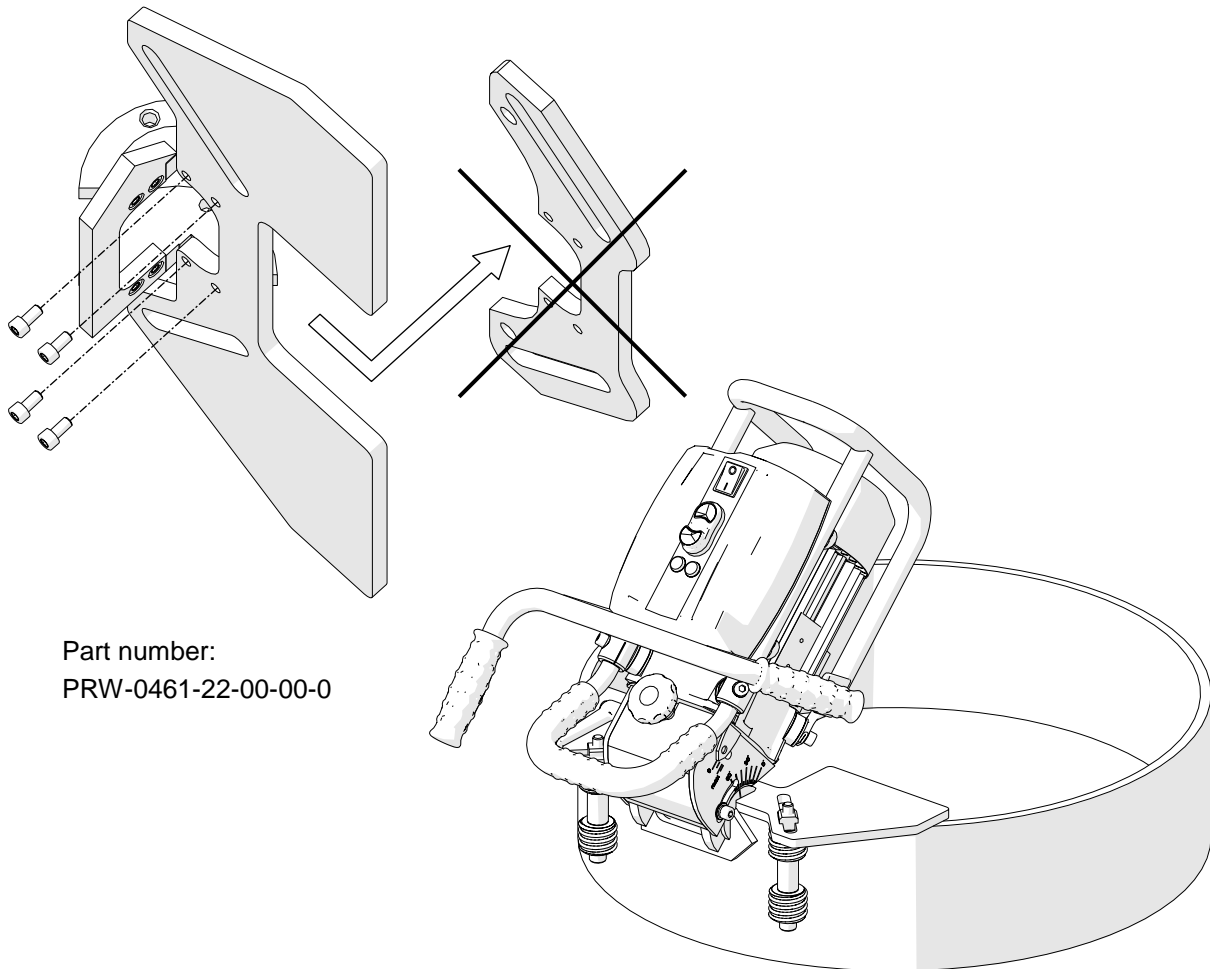
Use the adjusting knob to set the indication “0” on the width pitch. Move the rollers away from each other and place the machine as shown in Figure 7, with the guide touching the pipe. Then, move the rollers symmetrically to touch the pipe, secure with the bolts in this position, and set the required bevel width and angle.



**Figure 7.** Machine prepared for work on smaller pipes (Ø150–300 mm, 6–12”)

### 3.4. Beveling of larger pipes (only for optional equipment)

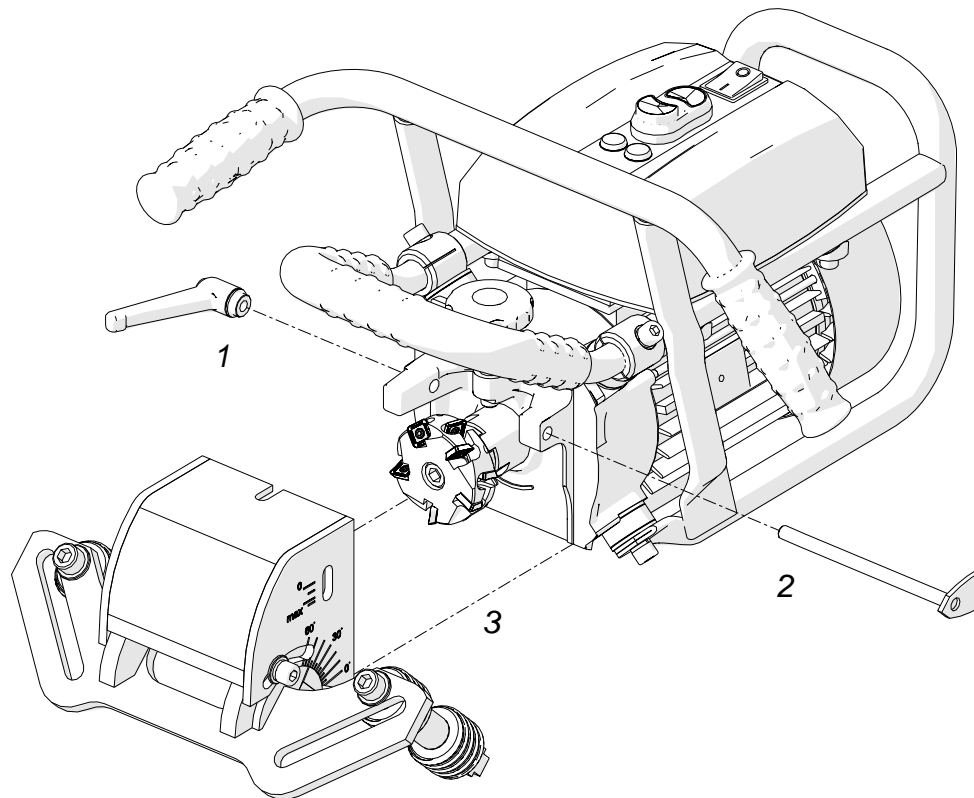
You can optionally order the guide for bevelling larger pipes with diameters of 260 mm to 600 mm (10–24"). To prepare the machine for work on larger pipes, disassemble the guide set as shown in Figure 5. Use the supplied 4 mm hex wrench to unscrew the standard guide and mount the guide for larger pipes (Figure 8), then screw in the bolts and mount the rollers as shown in Figure 6b.



**Figure 8.** Machine prepared for work on larges pipes ( $\varnothing$ 260–600 mm, 10–24")

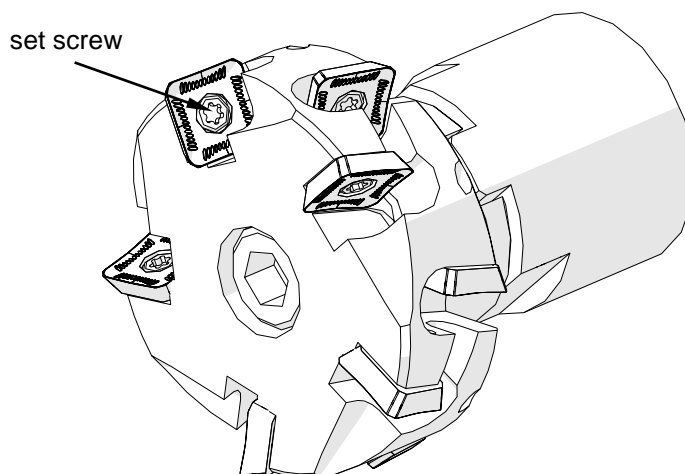
### 3.5. Replacement of cutting inserts

The machine is equipped with an uniform milling head that contains two insert rings, each holding five cutting inserts made of carbide, for a total of 10 inserts. The inserts can be replaced or rotated. Perform this work only with the power cord unplugged from power socket. To replace or rotate an insert, unscrew the lever (Figure 9), remove the pitch, and take out the milling head cover.



**Figure 9.** Dismantling of milling head cover

Use the supplied screwdriver to unscrew the set screw (Figure 10), then remove the external insert, and clean the socket. Next, place the rotated insert again or replace with a new one if all four edges are worn out. To replace an insert from the internal ring, remove the external insert first.



**Figure 10.** Replacement of cutting inserts

If the width of established bevels is low, the cutting inserts wear only on one, internal corner. Then, the good action is to change the inserts between the rings (Figure 11), which will extend the life of the inserts.

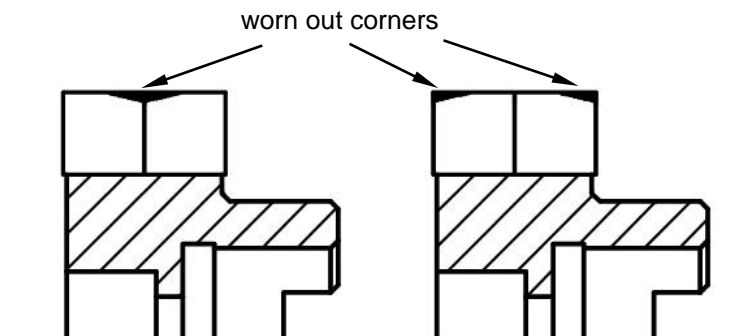


Figure 11. Changing cutting inserts between rings

### 3.6. Replacement of milling head

To replace the milling head, remove its cover in the manner shown in Figure 9. Then, place a 32 mm flat wrench on the driving ring (Figure 12) to lock the spindle rotation, use the supplied 8 mm hex wrench to unscrew the bolt, and remove the milling head. The 32 mm flat wrench is not included in standard equipment.

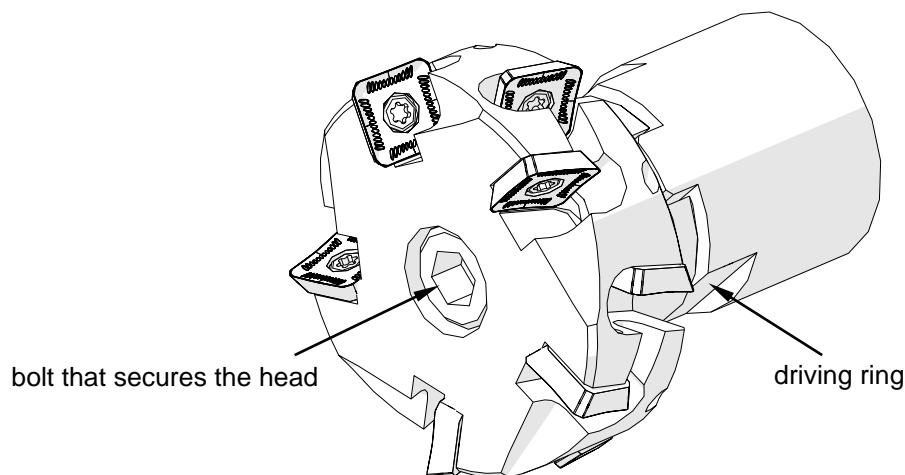
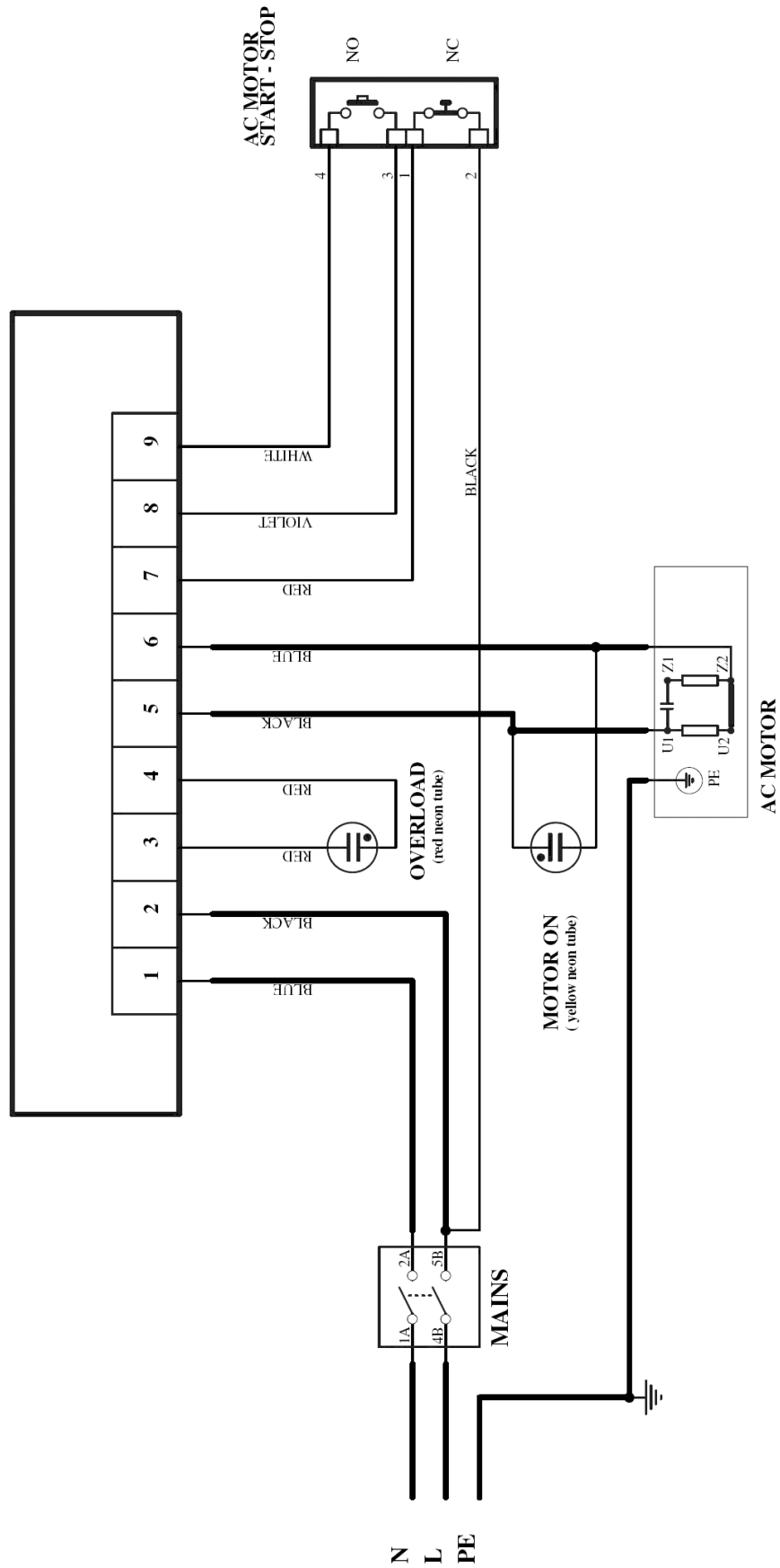


Figure 12. Replacement of milling head

**4. WIRING DIAGRAM**

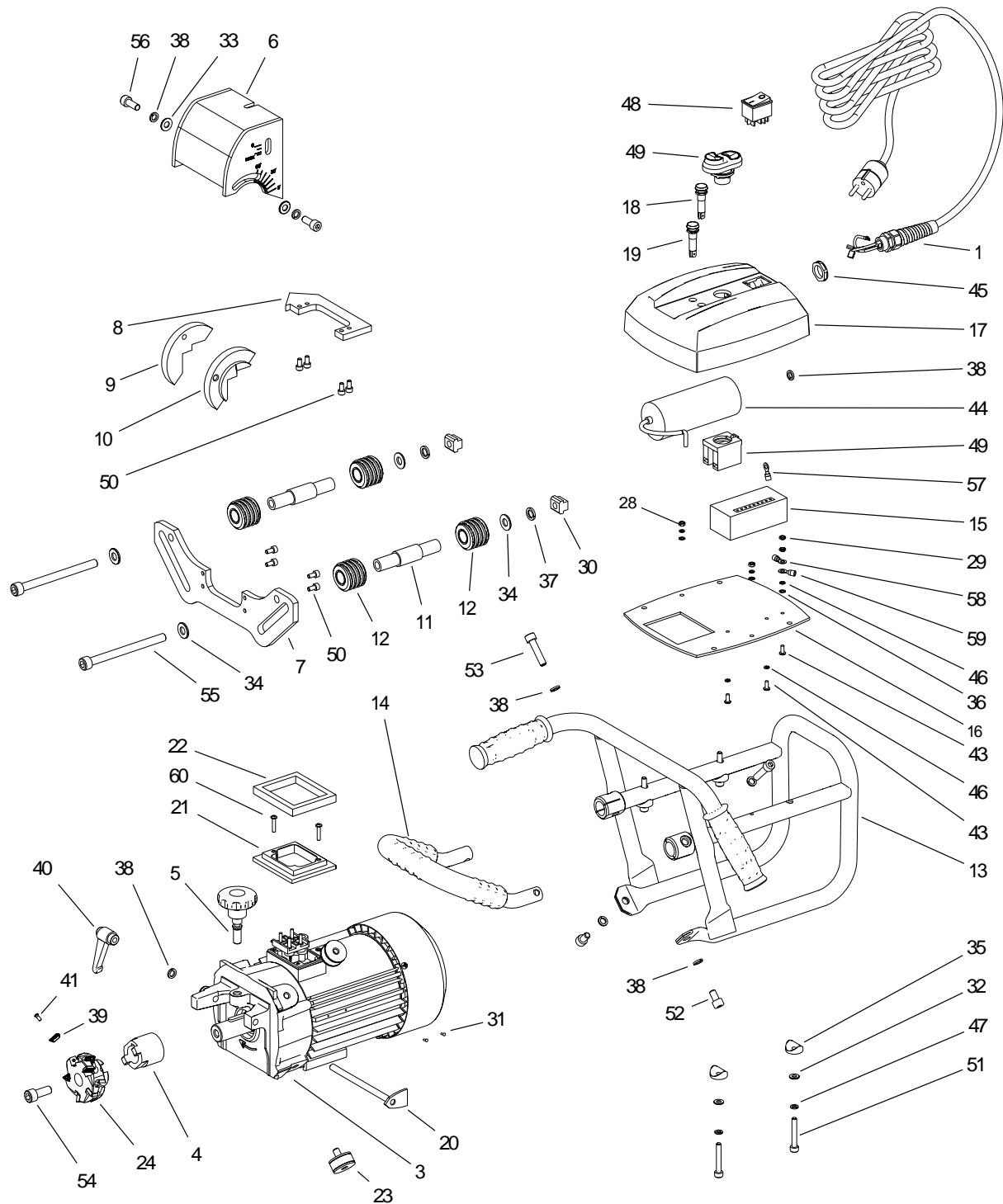




## 5. SPARE AND WEARING PARTS

<b>Name</b>	<b>Number</b>
Milling head (including mounting screws, screwdriver, and grease)	GLW-0461-03-00-00-0
Cutting insert	PLY-000197
Mounting screw for inserts	SRB-000311
Screwdriver for mounting screws	WKT-000004
Grease for screws (5 g, 0.17 oz)	SMR-000005

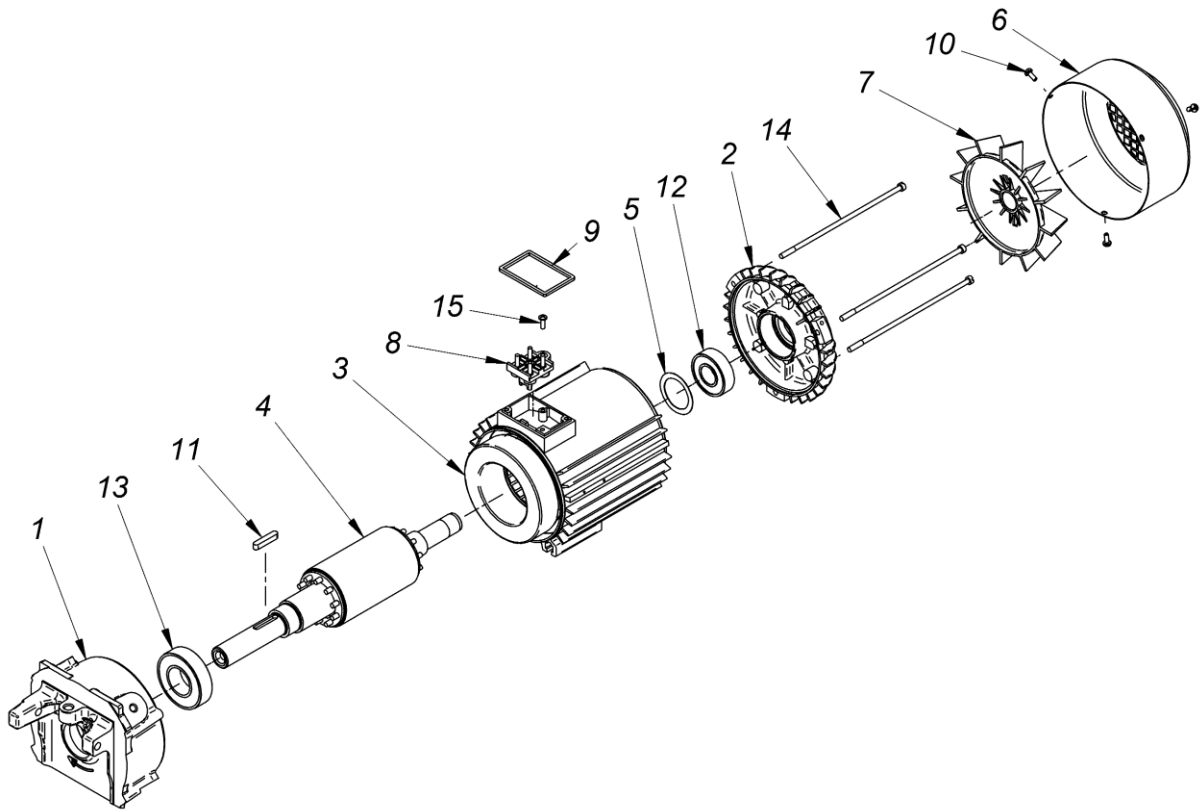
**6. EXPLODED DRAWINGS AND PARTS LIST**



ITEM	PART NUMBER	DESCRIPTION	Q-TY
1	PWD-0461-17-00-00-0	POWER CORD 230V	1
1	PWD-0461-17-00-00-1	POWER CORD 115V	1
1	PWD-0461-17-00-00-2	POWER CORD 230V (AU)	1
3	SLN-0461-01-00-00-2	MOTOR ASSY 230V	1
3	SLN-0461-01-00-00-3	MOTOR ASSY 115V	1
4	ZBI-0461-02-00-00-0	DRIVING RING	1
5	PKT-0461-04-00-00-0	KNOB	1
6	OSL-0461-05-00-00-0	MILLING HEAD COVER	1
7	PRW-0461-06-01-00-1	VERTICAL GUIDE	1
8	PRW-0461-06-02-00-1	HORIZONTAL GUIDE	1
9	OBS-0461-06-03-00-1	GUIDE HOLDER I	1
10	OBS-0461-06-04-00-1	GUIDE HOLDER II	1
11	OSK-0461-06-05-00-0	PIVOT	2
12	RLK-0461-06-06-00-0	ROLLER	4
13	RMK-0461-07-00-00-0	FRAME	1
14	RKJ-0461-08-00-00-0	FRONT HANDLE	1
15	MDL-0461-09-02-00-0	ELECTRONIC MODULE ASSY 230V	1
15	MDL-0461-09-02-00-1	ELECTRONIC MODULE ASSY 115V	1
16	PLY-0461-09-03-00-0	BOTTOM PLATE	1
17	PKR-0461-09-04-00-0	CONTROLLER HOUSING COVER	1
18	KON-0461-09-10-00-0	RED LAMP	1
19	KON-0461-09-11-00-0	YELLOW LAMP	1
20	WSK-0461-11-00-00-0	PENETRATION INDICATOR ASSY	1
21	LCZ-0461-12-00-00-1	LINK	1
22	USZ-0461-13-00-00-0	RUBBER SEAL	1
23	WBR-0461-14-00-00-0	DAMPER	4
24	GLW-0461-03-00-00-0	MILLING HEAD WITH SCREWS	1
28	NKR-000014	HEX. NUT M4	2
29	NKR-000032	NUT SHORT M4	2
30	NKR-000082	T-NUT	2
31	NIT-000010	ROUND HEAD RIVET 2x6	2
32	PDK-000021	ROUND WASHER 6.4	4
33	PDK-000022	ROUND WASHER 8.4	3
34	PDK-000026	ROUND WASHER 10.5	4
35	PDK-000175	SADDLE WASHER	4
36	PDK-000060	EXTERNAL TOOTH SPRING WASHER 4.3	6
37	PDK-000052	SPRING WASHER 10.2	2
38	PDK-000051	SPRING WASHER 8.2	8
39	PLY-000197	CUTTING INSERT	10
40	RKJ-000010	HANDLEVER	1
41	SRB-000311	MOUNTING BOLT	10
43	WKR-000183	CROSS RECESSED PAN HEAD SCREW M4x10	4
44	KND-000114	CAPACITOR 30uF 240V	1

ITEM	PART NUMBER	DESCRIPTION	Q-TY
44	KND-000115	CAPACITOR 80uF 110V	1
45	NKR-000040	STRAIN RELIEF NUT	1
46	PDK-000043	SPRING WASHER 4.1	6
47	PDK-000046	SPRING WASHER 6.1	4
48	PNK-000013	POWER SWITCH	1
49	WLC-000008	MOTOR ON/OFF SWITCH	1
50	SRB-000075	HEX. SOCKET BOLT M5x10	8
51	SRB-000124	HEX. SOCKET BOLT M6x40	4
52	SRB-000141	HEX. SOCKET BOLT M8x14	2
53	SRB-000156	HEX. SOCKET BOLT M8x35	2
54	SRB-000046	HEX. SOCKET BOLT M10x25	1
55	SRB-000309	HEX. SOCKET BOLT M10x120	2
56	SRB-000148	HEX. SOCKET BOLT M8x20	2
57	WZK-0461-09-07-00-0	STOP BUTTON WIRE SET	1
58	WZK-0461-09-08-00-0	CONTROLLER PLATE GROUNDING WIRE	1
59	WZK-0461-09-09-00-0	MOTOR GROUNDING WIRE	1
60	WKR-000446	CROSS RECESSED SCREW M4x20	2
61*	SKR-0461-15-00-00-0	METAL BOX	1
62*	KLC-000011	8 MM HEX WRENCH	1
63*	KLC-0461-16-00-00-0	6 MM HEX WRENCH-mod.	1
64*	WKT-000004	TORX SCREWDRIVER T15x100	1
65*	KLC-000032	12 MM FLAT WRENCH	1
66*	KLC-000007	4 MM HEX WRENCH	1
67*	SMR-000005	GREASE FOR SCREWS	1

\* not shown on the drawing



SLN-0461-01-00-00-2		MOTOR ASSY 230V	
SLN-0461-01-00-00-3		MOTOR ASSY 115V	
ITEM	DESCRIPTION	PART NUMBER	Q-TY
1	TRC-0461-01-02-00-2	BEARING DISK N	1
2	TRC-000003	BEARING DISK P	1
3	KDL-000001	STATOR BODY 230V	1
3	KDL-000002	STATOR BODY 110V	1
4	WRN-000050	ROTOR	1
5	PDK-000195	CLEARANCE REMOVAL SPRING WASHER	1
6	OSL-000184	FAN COVER	1
7	WNT-000008	FAN	1
8	TBL-000032	4-TERMINAL PLATE	1
9	USZ-000030	SEAL no. 4	1
10	WKR-000466	SELF-TAPPING SCREW M4x8	3
11	WPS-000015	PIN A6x6x32	1
12	LOZ-000139	BALL BEARING 20x47x14	1
13	LOZ-000140	BALL BEARING 30x62x16	1
14	SRB-000349	DRAWBOLT E/M5x168	3
15	WKR-000467	SELF-TAPPING SCREW M4x12	1

## 7. DECLARATION OF CONFORMITY

### *EC Declaration of Conformity*

We

**PROMOTECH Ltd.**  
**Elewatorska 23/1**  
**15-620 Bialystok**  
**Poland**

declare with full responsibility that product:

### **BM-21 BEVELING MACHINE**

which the declaration applies to is in accordance with the following standard:

- EN 50144-1

and satisfies safety regulations of the guidelines: 2006/95/EC and 2006/42/EC.

Bialystok, 8 November 2011



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Marek Siergiej  
Chairman

**8. QUALITY CERTIFICATE**

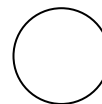
**Machine control card  
BM-21 BEVELING MACHINE**

Serial number .....

Electric test

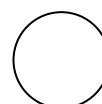
Type of test	Result	Name of tester
Test with sinusoidal voltage (voltage 1000 V, frequency 50 Hz)		..... Date
Resistance of the protective circuit	..... Ω	..... Signature

Quality control .....



**Adjustments, inspections**

Quality control .....



**9. WARRANTY CARD**

**WARRANTY CARD No.....**

..... in the name of Manufacturer warrants the BM-21 Beveling Machine to be free of defects in material and workmanship under normal use for a period of 12 months from date of sale.

This warranty does not cover cutting inserts, damage or wear that arise from misuse, accident, tempering or any other causes not related to defects in workmanship or material.

Date of production .....

Serial number .....

Date of sale .....

Signature of seller.....

1.07 / 23 June 2013

***WE RESERVE THE RIGHT TO MAKE CORRECTIONS  
AND MODIFICATIONS IN THIS MANUAL WITHOUT PRIOR NOTICE***