

INSTRUCTIONS and PARTS MANUAL

PBM-2000 (120 VAC)

PBM-2002 (220 VAC)

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Number _____

Serial Number _____

Date of Purchase _____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above.

LIT-PBM-IPM-0912

Bug-O Systems is guided by honesty, integrity and ethics in service to our customers and in all we do.



B U G - O S Y S T E M S

A DIVISION OF WELD TOOLING CORPORATION



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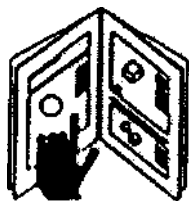
SAFETY

PROTECT YOURSELF AND OTHERS FROM SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



ELECTRIC SHOCK CAN KILL.

- 1)The equipment is not waterproof. Using the unit in a wet environment may result in serious injury. Do not touch equipment when wet or standing in a wet location.
- 2)The unused connectors have power on them. Always keep the unused connectors covered with the supplied protective panels. Operation of the machine without the protective panels may result in injury.
- 3)Never open the equipment without first unplugging the power cord or serious injury may result.
- 4)Verify the customer supplied power connections are made in accordance with all applicable local and national electrical safety codes. If none exist, use International Electric Code (IEC) 950.
- 5)Never remove or bypass the equipment power cord ground. Verify the equipment is grounded in accordance with all applicable local and national electrical safety codes. In none exist, use International Electric Code (IEC) 950.



READ INSTRUCTIONS.

Read the instruction manual before installing and using the equipment.



MOVING PARTS can cause serious injury.

- 1)Never try to stop the pinion from moving except by removing power or by using the STOP control.
- 2)Do not remove any protective panels, covers or guards and operate equipment.



FALLING EQUIPMENT can cause serious personal injury and equipment damage.

Faulty or careless user installation is possible. As a result, never stand or walk underneath equipment.



PLASMA CUTTING can produce destructive High Voltage at High Frequency.

- 1)If using plasma, see that the machine as well as the plasma power source is properly grounded.
- 2)Do not use older model plasma machines meant for manual operation. These can leak high frequency at high voltages, which can cause dangerous shock, as well as destroy control circuits.
- 3)Read the instruction manual page on plasma cutting carefully, and follow all precautions.

PBM-2000
INSTRUCTIONS AND PARTS MANUAL
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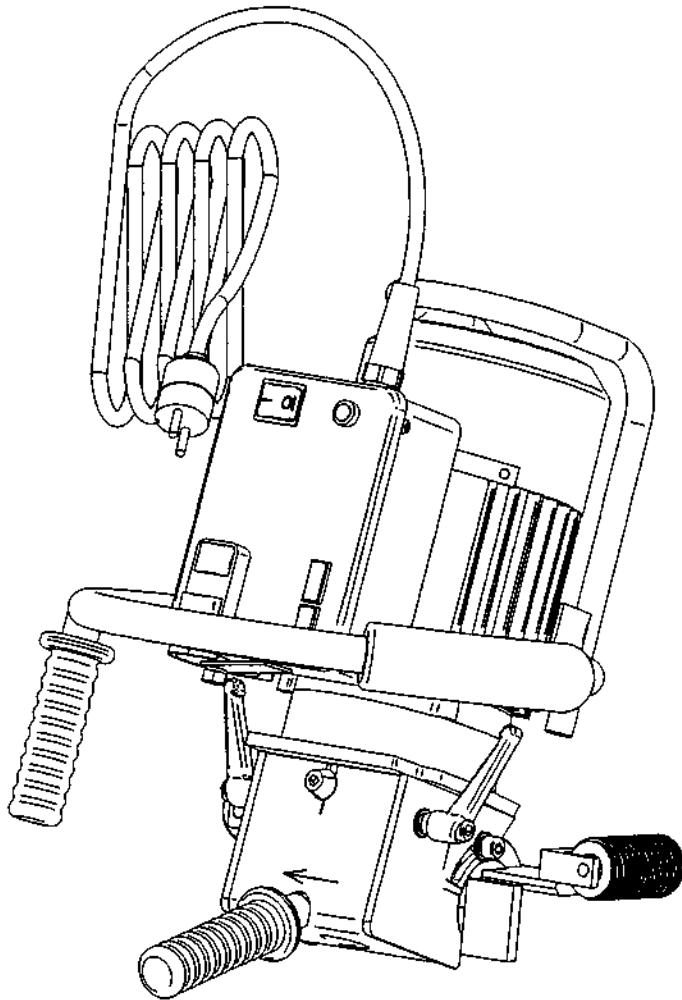
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GENERAL INFORMATION

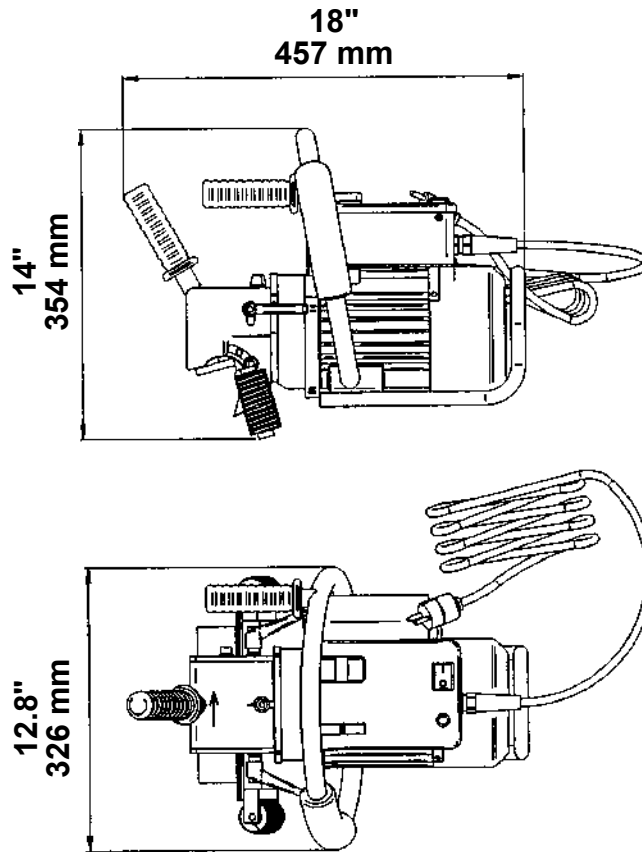
The beveling machine PBM-2000 is designed for milling steel edges prior to welding. It is reliable and simple to use. The machine can be used for beveling straight and curved steel sheets and pipes. It allows you to bevel steel edges between 15 and 60 degrees. Maximum width of cut is 3/4" (19 mm). When equipped with a special attachment it can also work on pipes above 6" (152.4 mm) diameter.

Before you start work with the machine, please read these instructions carefully. Take special note of safety recommendations.

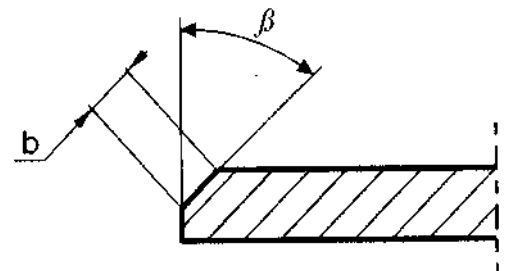


PBM-2000 / PBM-2002

TECHNICAL DATA



- Power Supply (PBM-2000) 110VAC/50-60Hz/1Ph
(PBM-2002) 220VAC/50-60Hz/1Ph
- Motor Electric, single phase, induction, with work capacitor
- Power Required 1.1 kW
- Speed 2820 min-1
- Maximum Instantaneous Overload 18 A
- Cut off Point 14 A
- Electric Safeguard Neutral earthing
- Insulation Protection IP 20
- Cutting Speed around 550 m/min
- Max. Width of Cut $b + .75"$ (19 mm) (see drawing 1)
- Range of Angles $15^\circ < \beta < 60^\circ$ (see drawing 1)
- Total Weight 45.2 lbs (20.5 kg)
- Fuse 2 A
- Noise Level Above 85dB



Tool: Double milling head with multi-blade inserts

Multi-blade Inserts : PBM-2000 (CERMET thickness, 3, 10 mm) – 12 pcs.

Drawing 1

STANDARD BEVELING MACHINE EQUIPMENT

PBM-2000 comes in a set which consists of:

Standard:

- Metal box
- Beveling machine with a set of inserts for mild steel
- Tool box (part 60)
- 2 Allen wrenches: Hex s6 (part 61), Hex s3 (part 63)
- Milling head fastening tool (part 62)
- Milling head interlock (part 64)
- Milling head puller (part 65)
- Operator's manual
- Locking screw – 6 pcs.

Optional:

- Edge planing set 0° (part 66)
- Pipe beveling attachment (part 67)
- Radial R3 milling set (part 68)

Note: (part #) refers to “PBM-2000 Beveling Machine / Parts List” (pages 14-15)

GENERAL SAFETY ADVICE

Beveling machine must not be used when:

1. The operator has not read the instructions and parts manual.
2. The work to be done is not in agreement with the recommendations in this manual.
3. The beveling machine is not complete or has been repaired with non-original parts.
4. The specifications of the power supply do not conform to those stated on the motor plate.
5. The operator has not checked the condition of the beveling machine, the condition of power cable, control panel and milling inserts.
6. The power supply socket is not equipped with a protection circuit.
7. Bystanders are present in the immediate vicinity of machine.

Important rules of safe use of beveling machine:

1. Before attempting to work with the machine check condition of electrical components including power cord and plug.
2. The beveling machine should be connected to an installation equipped with a protection circuit (neutral or ground) and protected with a 16 A fuse – for 220V. When used on building sites, it must be supplied through a separation transformer made in the second class of protection.
3. Machine can be used outdoors, but is not weatherproof. Do not expose to rain, snow or frost.
4. Do not use the machine in explosion hazard zones.
5. Always wear safety goggles and ear protection.
6. Do not remove metal chips with bare hands.
7. Inserts must be fastened firmly using lock screw.
8. If blade edge is worn, turn blade by 90° in a milling socket or change to a new one as described on pg.12.
9. Use tools recommended in instructions and parts manual only.
10. After work is complete, always clean metal chips from beveling machine.
11. Always unplug machine from the power supply during any work on the machine or when adjusting angles.

START-UP AND OPERATION

PBM-2000 comes in a ready to use state. The only operation that needs to be carried out is adjusting it to the workpiece width and the beveling angle.

Plug machine into the power outlet. Both the plug and the socket must be grounded. Lift the machine and place it vertically on its horizontal slide, on the edge of your workpiece, which should be on your right hand side. Make sure that the tool does not touch the workpiece. You can now turn the machine on by pressing the main switch (53) to position "I". To switch machine off, press switch (53) to position "O". You can now start the motor by pressing switch (54, button "I"). Notice an amber light coming on (52). To stop the motor press switch (54) again (button "O").

Start sliding the machine slowly to the right, until such a moment that the tool starts to cut steel but remember – the direction of feed is marked on the spindle housing (9). The feed rate depends on the thickness of steel which is being beveled and on the composition of that steel. Most common steels can be beveled with just one pass.

It is recommended to bevel cuts above .5" (12 mm) width in 2 or 3 passes. Operator will put less strength and time while performing multipass beveling.

If the operator attempts to mill too fast and too thick, the overload red indicator (51) will start flashing and if the motor is overloaded even harder, power will be cut off. To start the machine again, move the tool away from beveled edge, then press button "O" switch (54), and after a few seconds you can start the machine again by pressing button "I" (switch 54).

The operator is permitted to use the machine at the brink of the cut-off point with overload light blinking, but the temperature of the motor should not exceed 85°C. Higher temperature can permanently damage the rotor. PBM-2000 is designed to work under full load for about one hour, after which it should cool down for about 15 minutes. The motor will not cool down running free, but it will get even warmer.

REQUIRED ANGLE AND WIDTH OF CUT SETTING

There are two adjustment mechanisms:

- For adjusting the beveling angle required, (β – see drawing 1),
- For adjusting the machine to the thickness of steel which is being cut, (b - see drawing 1).

Before you start any adjustments make sure that the machine is unplugged.

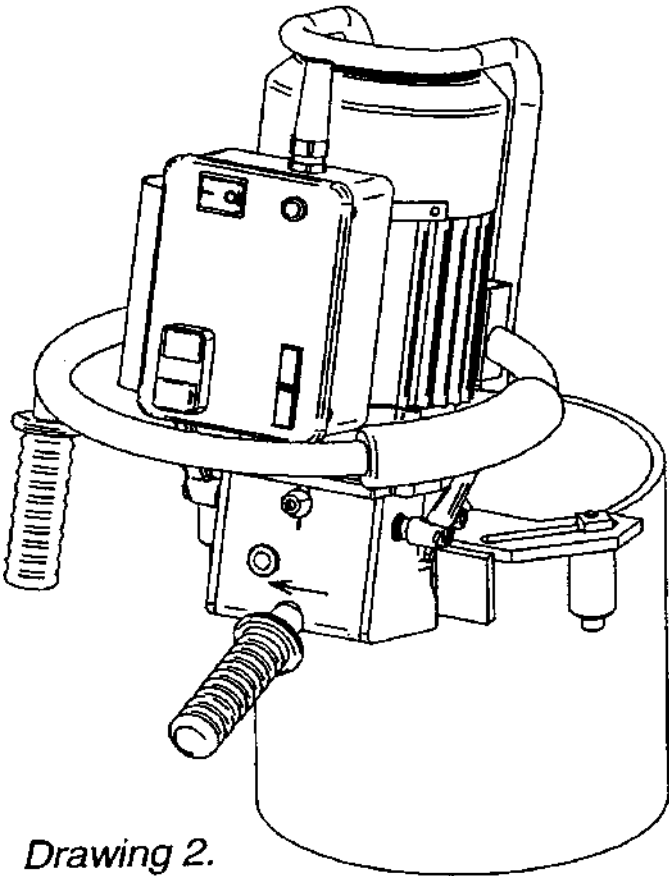
To change beveling angle loosen two M8 bolts (12) located on both sides of the Milling Head Housing (9) and interlocking Vertical and Horizontal Slides. Then change position of the two slides, setting the required angle according to the pitch marked on the side of the housing. After setting the right angle, tighten all bolts.

The width of cut can be set by turning Feed Bolt (7) which will change the position of the Milling Head. Do it by loosening two levers (22) located on the side walls of the housing and turning the bolt (7). Then tighten levers (22). The pitch shown on the side of the housing gives only approximate parameters. Precise beveling width should be adjusted empirically by appropriate adjustment of the housing.

BEVELING PIPES

Special optional pipe beveling attachment PBM-2100 allows you to bevel pipes and curves. To prepare the machine for work on pipes, take the flat slide off the machine and replace it with the pipe attachment. Move the housing (9) to its "zero width of cut" position. Place machine on the edge of pipe, in such a way that the milling tool touches the workpiece (drawing 2). Then, loosen bolts and move rollers symmetrically towards the pipe so that they rest on it. Fasten both rollers. You can now adjust the required beveling angle.

IT IS NOT RECOMMENDED TO BEVEL PIPES WITH RADIUS LESS THAN 6" (150 mm).

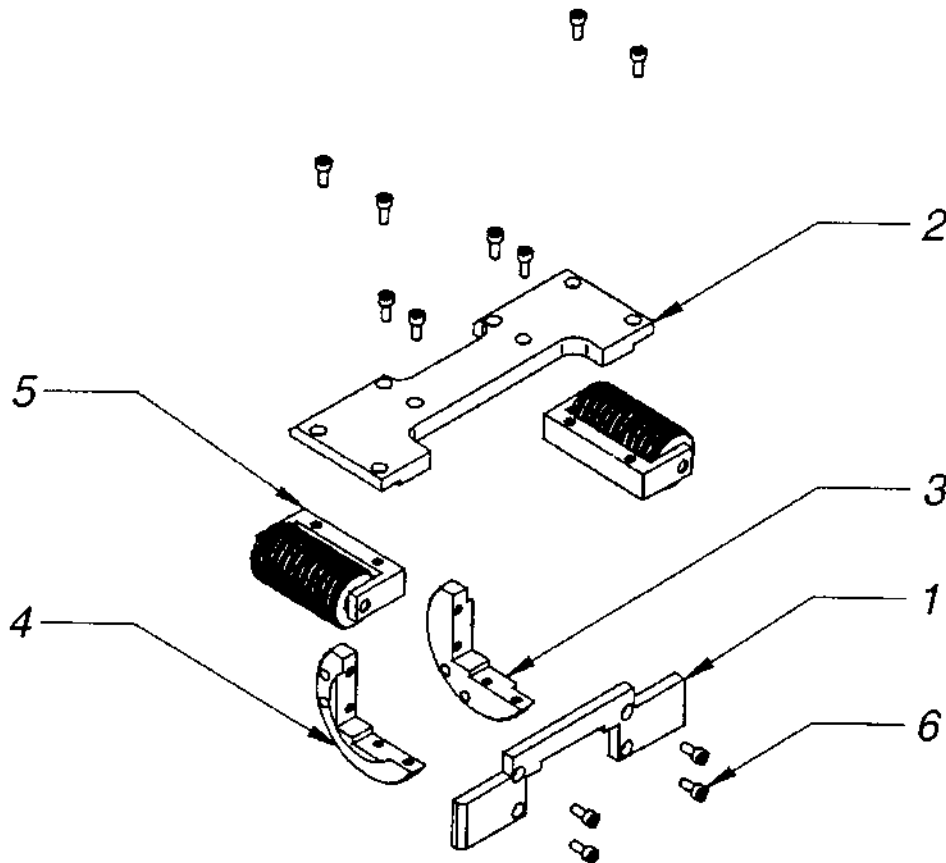


Drawing 2.

EDGE PLANING WITH SET 0°

To prepare the machine for planing, take the 15° - 60° slide off the machine and replace it with set 0° (CO2180-753-20-01). After replacing, set width of cut "b" to 0" (0 mm) and continue working in the same way as in regular beveling.

EDGE PLANING WITH SET 0° / EXPLODED VIEW / PARTS LIST

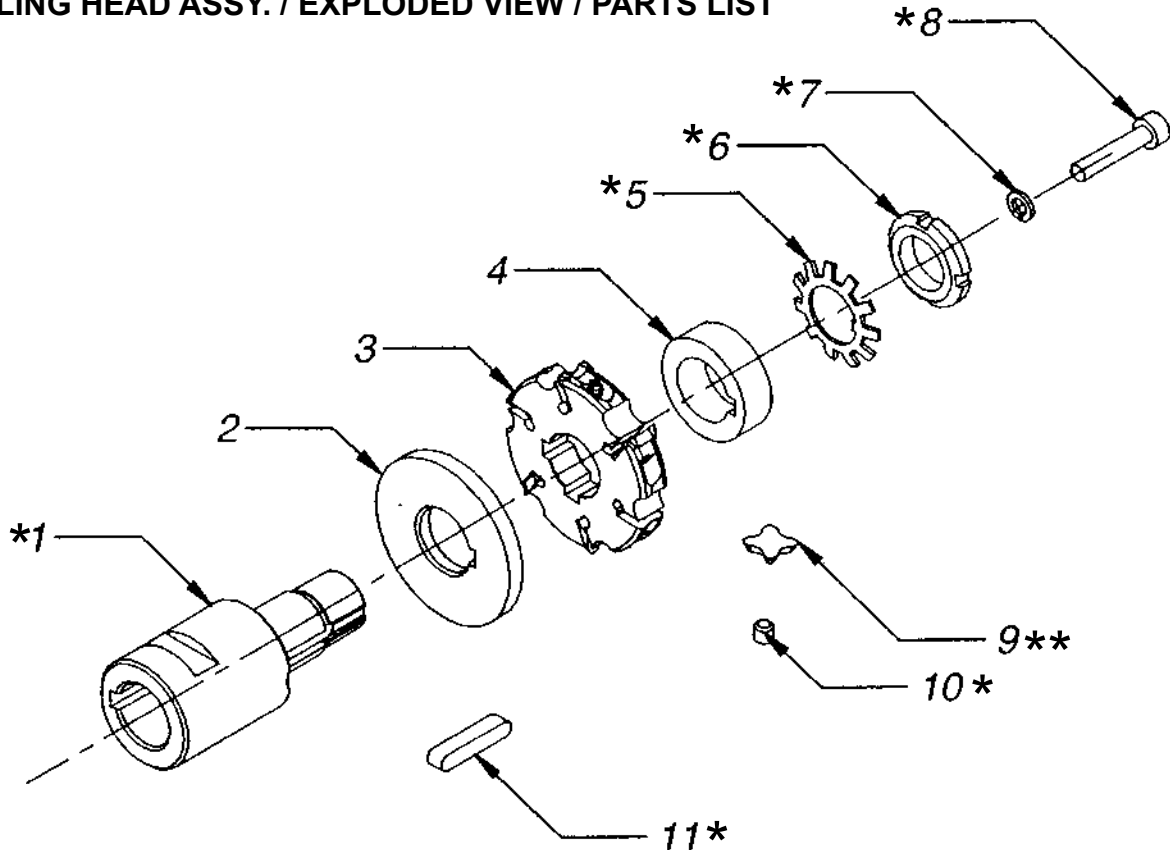


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	C02180-753-23-00	Guide slide I 0°	1
2	C02180-753-23-10	Guide slide II 0°	1
3	C02180-753-40-10	Sliders mounting I	1
4	C02180-753-40-20	Sliders mounting II	1
5	C02180-753-07-30	Roller set	2
6	N18230-205-12-00	Hex. Socket bolt	12

C028180-594-20-00 BEVELING RADIAL CUTS R=3

Before beveling radial cuts, change the milling heads (25) for radial R3 milling set (part 68). After that place the proper inserts for radial cuts B0908MK11 in sockets (Item 3 below). While changing the milling head, you need to use the milling head puller (65), milling head interlock (64) and milling head fastening tool (62). Before starting to bevel, remove the roller set (19) from the machine.

MILLING HEAD ASSY. / EXPLODED VIEW / PARTS LIST



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>	
*1	C02180-594-01-00	Milling head arbor	1	Standard Equipment
2	PDK-0059-42-01-00-0	Distance ring	1	Radial R3 milling set
3	ZSP0075-46-00-00-0	Milling head w/o inserts	1	Radial R3 milling set
4	PDK-0059-42-03-00-0	Washer R3	1	Radial R3 milling set
*5	N18648-204-00-00	Safety washer	1	Radial R3 milling set
*6	N18647-804-00-01	Bearing nut KM-4	1	Standard equipment
*7	N18200-806-01-02	Cushion washer	1	Standard equipment
*8	N18230-206-30-02	Hex. Socket bolt	1	Standard equipment
**9	PLY-0075-00-05-00-0	Milling insert R3	6	Radial R3 milling set
*10	PLY-0075-00-05-00-0	Insert screw M6x.75x6mm	6	Standard equipment
*11	WKR-000027	Milling head key	1	Standard equipment

* Items included with machine (not part of R3 assembly).

** Items included with machine but also sold separately for replacement.

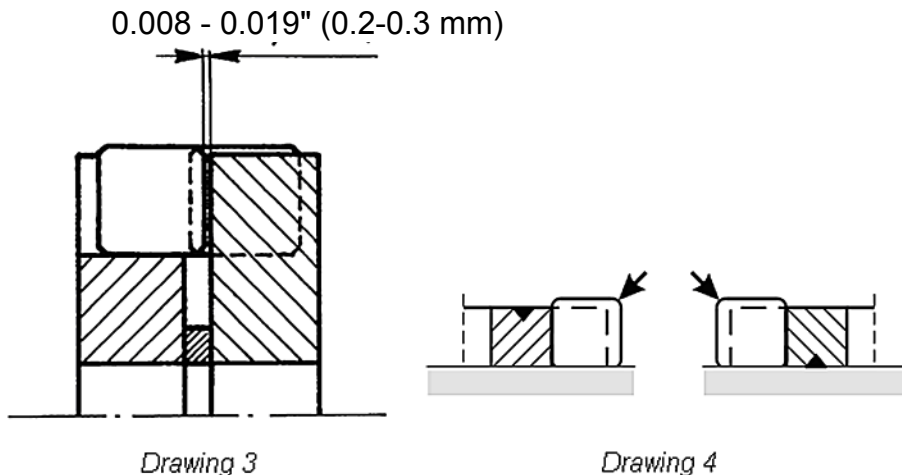
HOW TO CHANGE INSERTS

SAFETY WARNING: UNPLUG PBM-2000 FROM POWER SUPPLY BEFORE INSPECTING OR REPLACING ANY INSERTS!

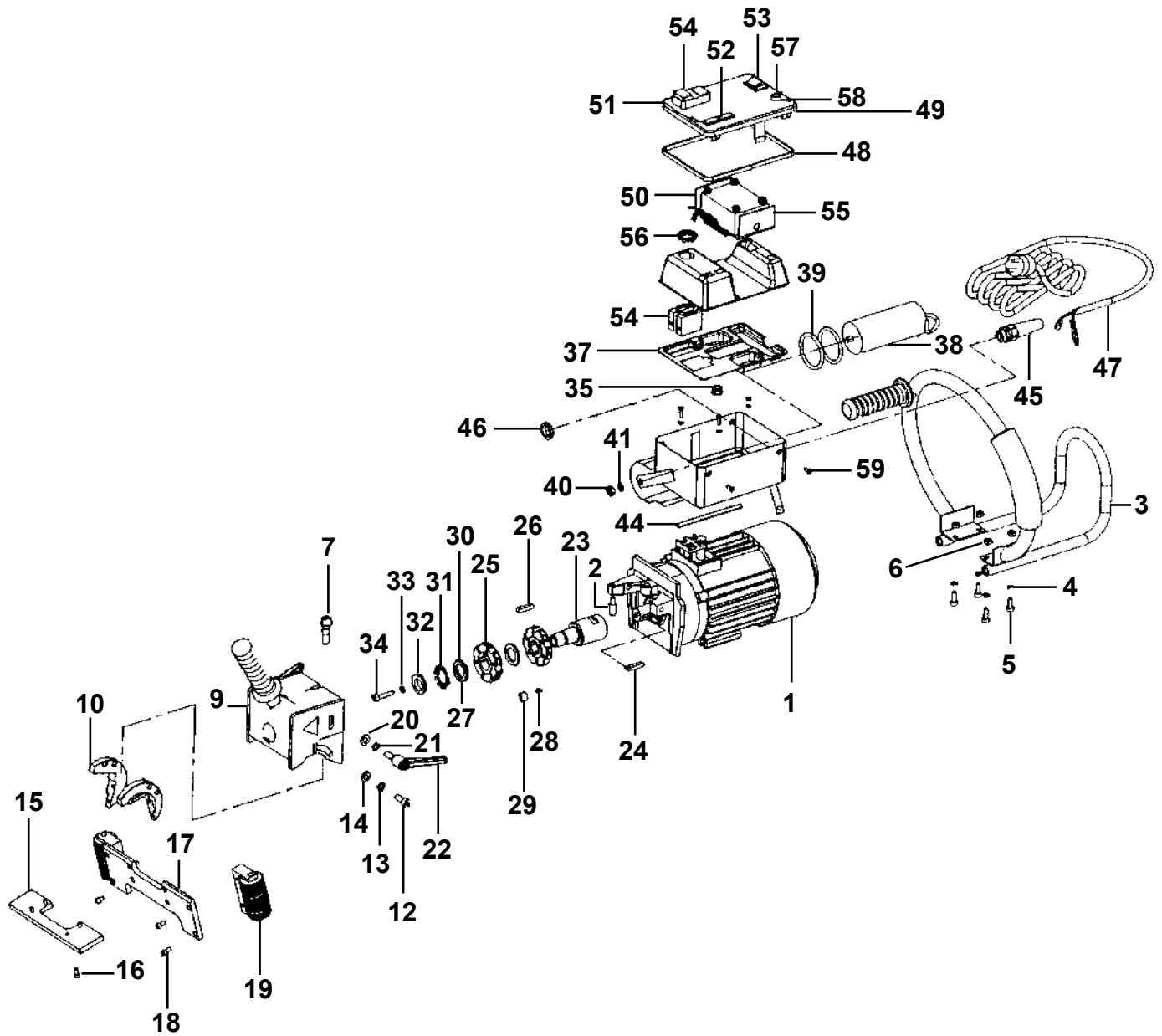
Machine PBM-2000 is equipped with a double milling head, containing twelve cermetalic inserts. Recommended PBM-2000 inserts are only made for this machine. In case of average quality construction steel, life expectancy of those inserts is around 492 running ft. (150 running meters) per each side of inserts and depends on user experience. Before you replace inserts for new ones make sure that all four sides of each insert were used. Take the Housing (9) off the machine. To do this, undo two levers (22). It is normally not necessary to take both Milling Heads (25) off the Spindle (23). Using Allen wrench s3 (63) undo screws (28) and remove inserts.

When changing inserts make sure that all inserts newly placed in the milling head are installed square and are pushed as far back (into the holder) as possible. Before pushing new inserts into the milling head always remove all swarfs. Drawing No. 3 shows how inserts should overlap each other. Make sure that the necessary gap of about .008" (0.2 mm) is always made.

If both milling heads were removed and then replaced on the main shaft, make sure that they are installed in the right direction and that tips of each milling head are shifted relative to each other for smoother work. If the width of cut is small then swap all inserts according to drawing No 4, thus extending their life even longer.



PBM-2000 BEVELING MACHINE / EXPLODED VIEW



PBM-2000 BEVELING MACHINE / PARTS LIST

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	C02180-751-00-00	Motor Assembly 230 V	1
		Motor Assembly 120 V	1
2	C02180-752-58-00	Stop Pin	1
3	C02180-751-09-01	Holder (Set)	1
4	N18200-806-01-01	Cushion Washer 6.1	4
5	N18230-206-16-02	Hex. Socket Bolt M6x25	4
6	N18214-406-00-01	Hex. Nut M6	4
7	C02180-592-02-00	Feed Bolt	1
8	C02180-753-40-00	Slides Set: 15°-60°	1
9	C02180-752-60-00	Spindle Housing: 15°-60°	1
10	C02180-753-40-10	Sliders Mounting I 15°-60°	1
11	CO2180-753-40-20	Sliders Mounting II 15°-60°	1
12	N18230-208-20-12	Hex. Socket Bolt M8x16	2
13	N18200-808-02-01	Split Lock Washer 8.2	2
14	N18200-608-04-01	Round Washer 8.4	2
15	C02180-593-03-00	Guide Slide I	1
16	N18230-205-10-12	Hex. Socket Bolt M5x10	8
17	C02180-753-07-01	Guide Slide II	1
18	N18230-205-10-12	Hex. Socket Bolt M5x10	4
19	C02180-753-07-30	Roller Set	2
20	N18200-608-04-01	Round Washer 8.4	2
21	N18200-808-02-00	Split Lock Washer 8.2	2
22	H00643-483-01-00	Handle Assy M8x20	2
23	C02180-594-01-00	Milling Head Arbor	1
24	C02180-754-02-00	Motor Key	1
25	PBM-2041	Milling Head .12" (3.1 mm) (2 pcs in set)	1 Set
26	PBM-2042	Milling Head Key	1
27	C02180-594-05-02	Distance Ring	1
28	PBM-2052	Insert Screw	12
29	PBM-2051	Milling Insert	12
30	C02180-594-11-00	Washer	1
31	PBM-2043	Safety Washer	1
32	PBM-2044	Bearing Nut KM-4	1
33	N18200-806-01-02	Split Lock Washer 6.2	1
34	N18230-206-30-02	Hex. Socket Bolt	1

PBM-2000 BEVELING MACHINE / PARTS LIST

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
35	C02180-755-19-00	Controller Cover	1
36	H01370-001-01-10	Snap Bushing LA 10	1
37	C02180-755-23-00	Internal Insulation	1
38	H01111-001-01-04	Capacitor 30NF/240V	1
39	H01370-020-01-00	Seal Ring	2
40	N18214-408-00-01	Hex. Nut M8	1
41	N18202-408-04-01	Spring Washer 8.3	1
42	N18200-804-01-01	Spring Washer 4.1	2
43	N18220-104-12-00	Screw M4x12 Cross Recessed	2
44	H01369-010-01-02	Seal L=120	1
45	H01131-133-02-02	Strain Relief	1
46	H01131-133-03-02	Strain Relief Nut	1
47	H01126-351-01-00	Power Cord w/ Strain Relief 230V	1
		Power Cord w/ Strain Relief 120V	1
48	H01369-010-01-02	Seal L=520	1
49	C02180-755-08-00	Cover (Upper)	1
50	C02180-756-00-01	Electronic Module 230V	1
		Electronic Module 120V	1
51	H00917-001-01-02	Red Light Indicator	1
52	H00917-001-01-01	Amber Light Indicator	1
53	H01115-168-01-01	Main Switch	1
54	H01115-169-01-01	Switched Fused Chassis Plug	1
55	C02180-755-24-00	Cover Insulation	1
56	H01115-166-01-03	Motor ON/OFF Switch Nut	1
57	H01156-114-01-04	Fuse Socket	1
58	H01156-113-01-05	Fuse	1
59	N18221-204-12-01	Flt Hd Slit. Screw M4x10	4
*60	C02180-596-01-00	Tool Box	1
*61	H00643-506-01-00	Hex. Wrench. S=6	1
*62	C02180-596-04-00	Milling Head Fastening Tool	1
*63	H00643-434-01-00	Hex. Wrench. S=3	1
*64	C02180-596-06-00	Milling Head Interlock	1
*65	C02180-596-07-00	Milling Head Puller	1
*66	C02180-753-20-01	Edge Planing Set	1
*67	PBM-2100	Pipe Beveling Attachment	1
*68	C02180-594-20-00	Radial R3 Set	1

*Items not shown on exploded view drawing.

WARRANTY

Limited Warranty

Model _____
Serial No. _____
Date Purchased: _____

FOR A PERIOD OF TWELVE (12) MONTHS FROM DELIVERY, BUG-O SYSTEMS WARRANTS TO THE ORIGINAL PURCHASER (DOES NOT INCLUDE AUTHORIZED DISTRIBUTORS), THAT A NEW MACHINE IS FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP AND AGREES TO REPAIR OR REPLACE, AT ITS OPTION, ANY DEFECTIVE PARTS OR MACHINE. THIS WARRANTY DOES NOT APPLY TO MACHINES, WHICH AFTER OUR INSPECTION, ARE DETERMINED TO HAVE BEEN DAMAGED DUE TO NEGLIGENCE, ABUSE, OVERLOADING, ACCIDENT OR IMPROPER USAGE. ALL SHIPPING AND HANDLING CHARGES WILL BE PAID BY CUSTOMER.

BUG-O SYSTEMS MAKES NO WARRANTY OF MERCHANTABILITY AND MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, BEYOND THE WARRANTY EXPRESSLY SET FORTH ABOVE. BUYER'S REMEDY FOR BREACH OF WARRANTY, HEREUNDER, SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF NON-CONFORMING PARTS AND MACHINES. UNDER NO CIRCUMSTANCES SHALL CONSEQUENTIAL DAMAGES BE RECOVERABLE.

HOW TO OBTAIN SERVICE:
IF YOU THINK THIS MACHINE IS NOT OPERATING PROPERLY, RE-READ THE INSTRUCTION MANUAL CAREFULLY, THEN CALL YOUR AUTHORIZED BUG-O SYSTEMS DISTRIBUTOR/ DEALER. IF HE CANNOT GIVE YOU THE NECESSARY SERVICE, WRITE OR PHONE US TO TELL US EXACTLY WHAT DIFFICULTY YOU HAVE EXPERIENCED. BE SURE TO MENTION THE MODEL AND SERIAL NUMBERS.