

SAFETY INSTRUCTIONS AND OPERATOR'S MANUAL FOR BEVELING MACHINE

PBM-2000

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-0109



BUG-O SYSTEMS

A DIVISION OF WELD TOOLING CORPORATION



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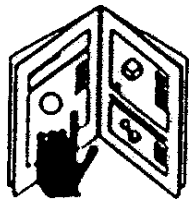
SAFETY

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.

HIGH FREQUENCY WARNINGS

SPECIAL PRECAUTIONS ARE REQUIRED WHEN USING PLASMA, TIG OR ANY WELDING PROCESS THAT USES HIGH FREQUENCY TO STRIKE AN ARC.



WARNING: HIGH FREQUENCY CAN EFFECT MACHINE OPERATION AND THEREFORE, WELD QUALITY.

Read the precautions below before installing and using the equipment.

PRECAUTIONS:

- 1) Some plasma or welding cables are strong sources of high frequency interference. NEVER lay a plasma or welding cable across the controls of the machine.
- 2) Always physically separate the plasma or welding cable leads from the machine cables. For example, the plasma or welding cable leads should NEVER be bundled with a pendant cable or the machine power cord. Maximize the separation between any machine cables and the plasma or welding cables.
- 3) Strictly follow the grounding procedures specified for the plasma or welding unit. NOTE: Some plasma and welding units produce exceptionally large amounts of high frequency noise. They may require a grounding rod be driven into the earth within six feet (2 meters) of the plasma or welding unit to become compatible with an automatic cutting or welding process.
- 4) If the high frequency is produced using a spark gap, adjust the points so the gap is as small as possible. The larger the gap, the higher the voltage and the higher the interference.
- 5) Some plasma or welding units will inject high frequency interference into the AC power line. Use separate power line branches whenever possible to power the plasma or welding source and the machine. Do not plug them into the same outlet box.
- 6) High frequency noise may enter the machine through the plasma or welding supply remote contactor leads. Some plasma and welding sources can produce noise spikes of up to several thousand volts. These sources are not compatible with automated cutting and welding equipment. It is recommended that the remote contactor leads on these plasma or welding sources not be connected to the machine. An alternate solution is to purchase a separate remote contactor isolation box.

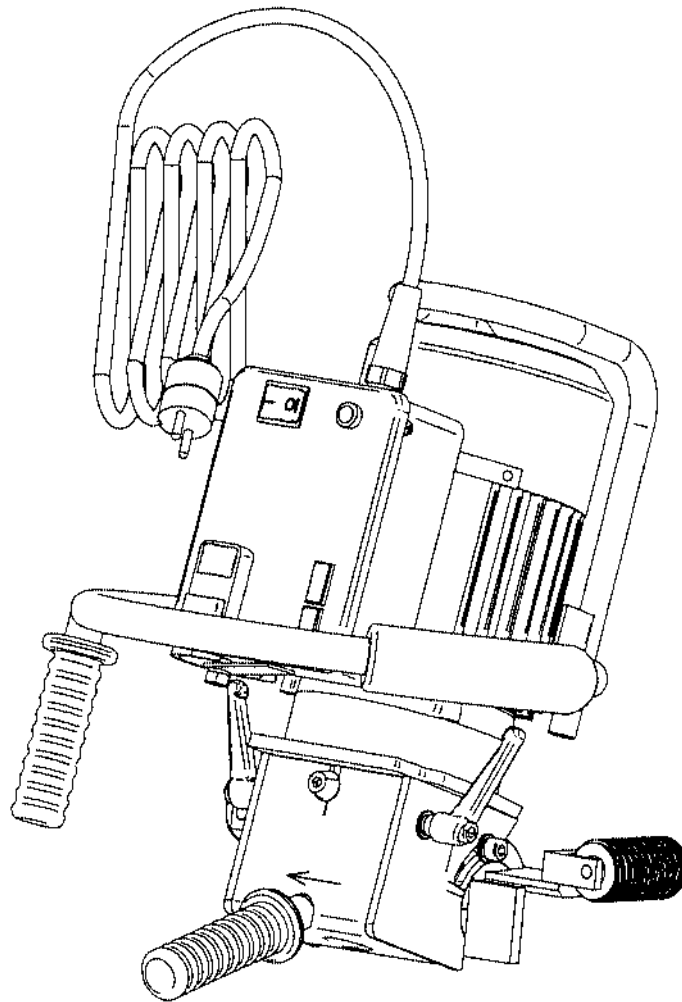
PBM-2000
SAFETY INSTRUCTIONS AND OPERATOR'S MANUAL
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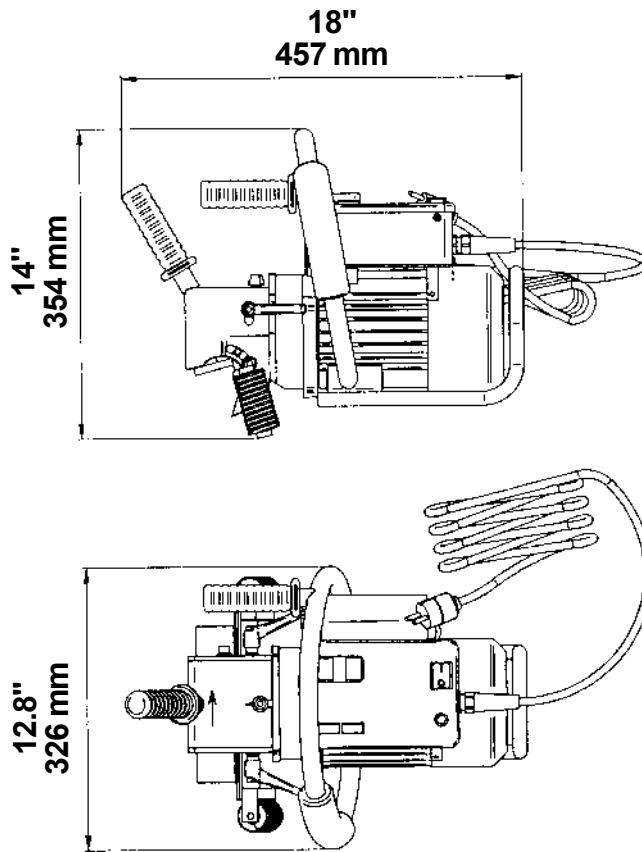
GENERAL INFORMATION

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. Maximal width of cut is 2" (18 mm). When equipped with a special attachment it can also work on pipes above 6" (150 mm) diameter.

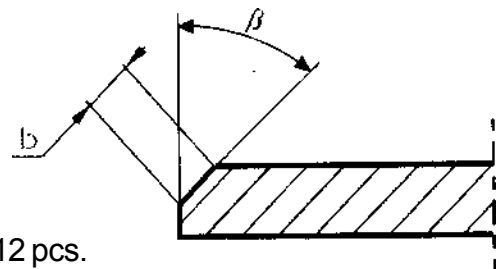
Before you start work with the machine, please read these instructions carefully. Take special note of safety recommendations.



TECHNICAL DATA



Power Supply	110 V AC /50/60 Hz
Motor	electric, single phase, induction, with work capacitor
Power Required	1,1 kW
Speed	2820 min ⁻¹
Maximal instantaneous overload	18 A
Cut of Point	14 A
Electric Safeguard	neutral earthing
Insulation Protection	IP 20
Cutting Speed	around 550 m/min
Max. width of cut	b + .71" (18 mm) (see drawing 1)
Range of Angles	15° < β < 60° (see drawing 1)
Total Weight	around 452 lbs (20,5 kg)
Fuse	2 A
Noise Level	above 85dB



Drawing 1

Tool: double milling head with multi-blade inserts

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

STANDARD BEVELING MACHINE EQUIPMENT

PBM-2000 comes in a set which consists of:

Standard:

- metal box
- beveling machine with a set of inserts
- 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:

- edges planning set 0° (part 66)
- pipe beveling attachment (part 67)
- radial R3 milling set (part 68)

GENERAL SAFETY ADVICE

Beveling machine must not be used when:

1. The operator has not read the Operator's 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 electrics including power cord and plug.
2. The beveling machine should be connected to an installation equipped with 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 used, turn blade by 90° in a milling socket or change to a new one indicated in Operator's Manual.
9. Use tools recommended in Operator's Manual only.
10. After finishing operating, always clean beveling machine from metal chips.
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. Specific instructions are given below in point 5

Plug machine into mains. Both the plug and the socket must be earthed. 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") what will be signaled with 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" (12mm) width in 2 or 3 passes. Operator will put less strength and time while performing multipass beveling.

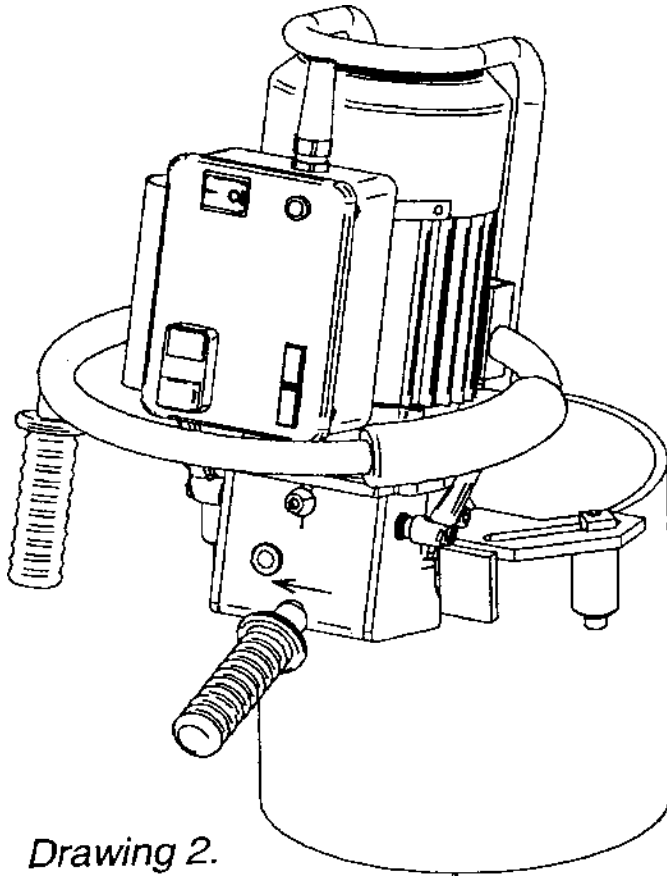
If the operator attempts to mill too fast and too thick, the overload red indicator (51) will start flashing and if motor is overloaded even harder power will be cut off. To start the machine again move the tool away from beveled edge, then press button "O" switch (54), and after a few seconds you can 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 1 hour, after which it should cook down for about 15 minutes. The motor will not cool down running free, but it will get even warmer.

BEVELING PIPES

Special optional pipe beveling attachment (part 67) 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.

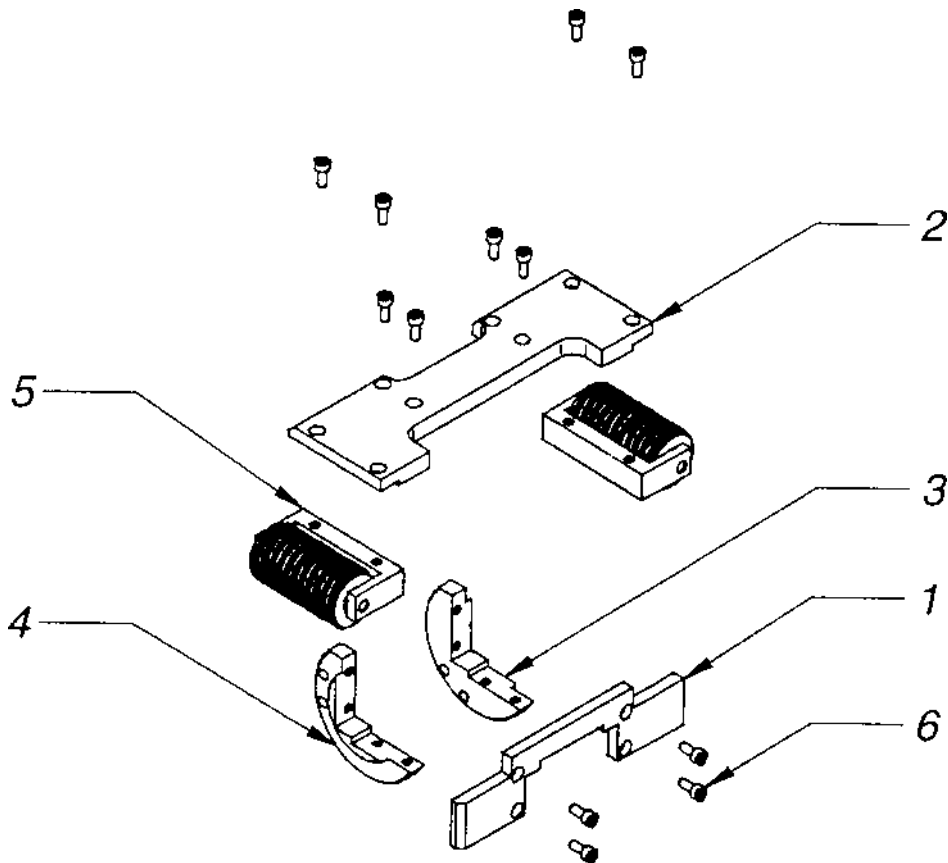
IT IS NOT RECOMMENDED TO BEVEL PIPES WITH RADIUS LESS THAN 6" (150 MM).



Drawing 2.

EDGES PLANNING WITH SET 0°

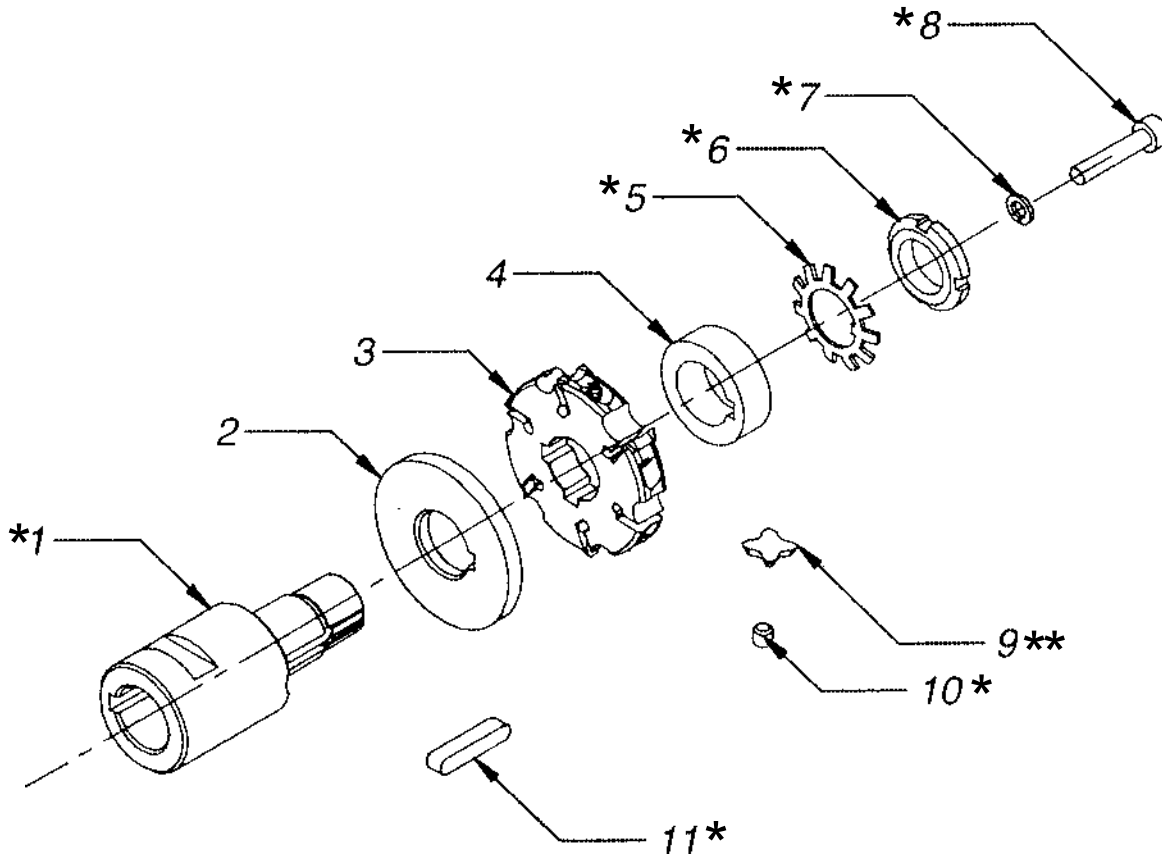
To prepare the machine for planning, take the 15° - 60° slide off the machine and replace it with set 0° (part 66-see drawing below). After replacing, set width of cut "b" to 0" (0 mm) and continue working in the same way as in regular beveling.



Item #	Description	Part Number	Qty
1	Guide slide I 0°	C02180-753-23-00	1
2	Guide slide II 0°	C02180-753-23-10	1
3	Sliders mounting I	C02180-753-40-10	1
4	Sliders mounting II	C02180-753-40-20	1
5	Roller set	C02180-753-07-30	2
6	Hex. Socket bolt	N18230-205-12-00	12

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

Before beveling radial cuts, change the milling heads (25) for radial R3 milling set (part 68). After that place a proper inserts for radial cuts B0908MK11 in sockets (see drawing). 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.



Item#	Description		Part Number	Qty
*1	Milling head arbor	Standard Equipment	C02180-594-01-00	1
2	Distance ring	Radial R3 milling set	PDK-0059-42-01-00-0	1
3	Milling head w/o inserts	Radial R3 milling set	ZSP0075-46-00-00-0	1
4	Washer R3	Radial R3 milling set	PDK-0059-42-03-00-0	1
*5	Safety washer	Radial R3 milling set	N18648-204-00-00	1
*6	Bearing nut KM-4	Standard equipment	N18647-804-00-01	1
*7	Cushion washer	Standard equipment	N18200-806-01-02	1
*8	Hex. Socket bolt	Standard equipment	N18230-206-30-02	1
**9	Milling insert R3	Radial R3 milling set	PLY-0075-00-05-00-0	6
*10	Insert screw M6x.75x6mm	Standard equipment	PLY-0075-00-05-00-0	6
*11	Milling head key	Standard equipment	WKR-000027	1

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

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

REQUIRED ANGLE AND WIDTH OF CUT SETTING

There are two adjustments 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 from the mains.

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.

HOW TO CHANGE 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 that 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 the replaced on the main shaft make sure that they are installed in the right direction and that tips of each milling head are shifted relatively 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.

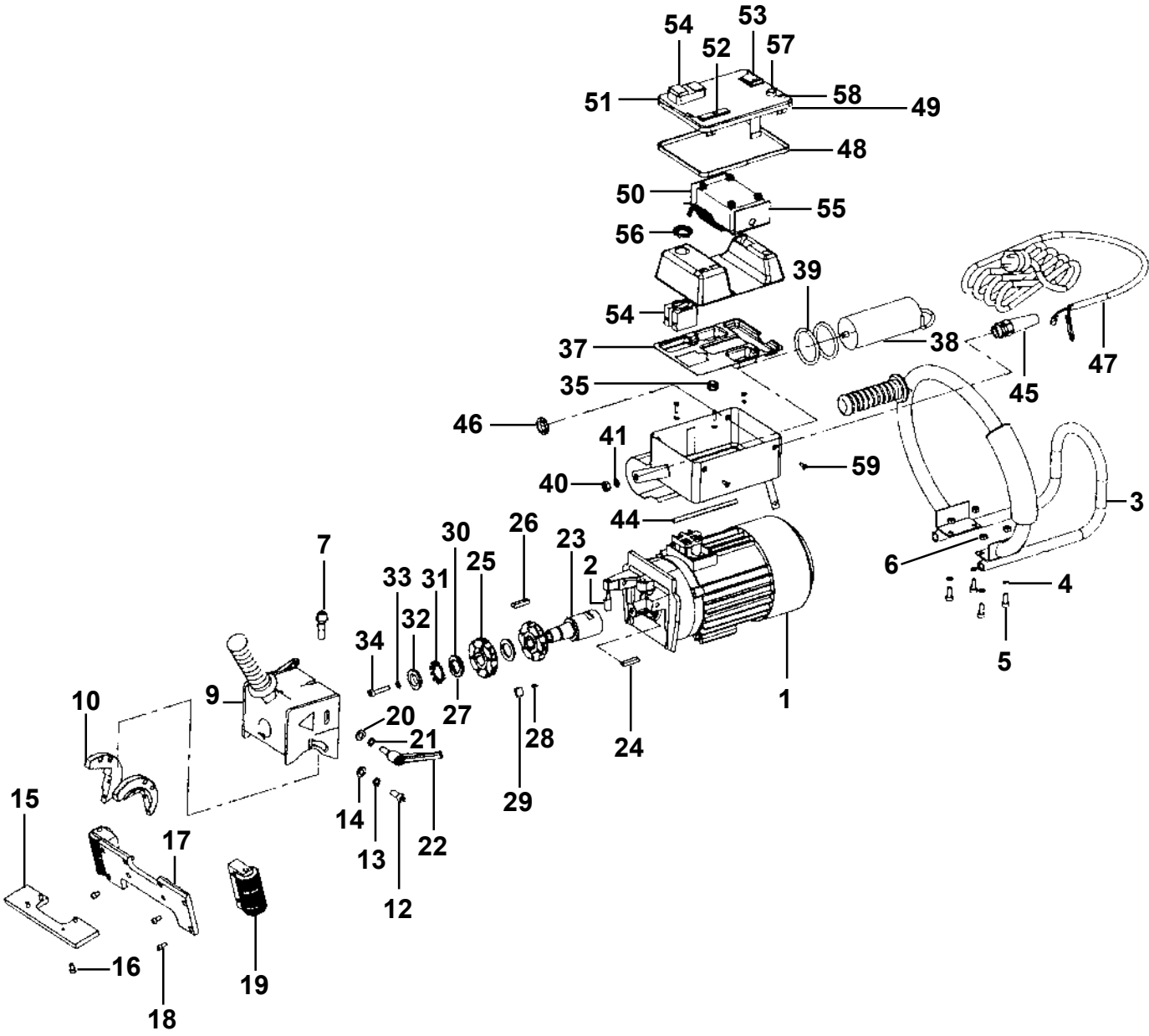
PARTS LIST

Item	Description	Part Number	Qty
1	Motor Assembly 230 V	C02180-751-00-00	1
	Motor Assembly 120 V		1
2	Stop Pin	C02180-752-58-00	1
3	Holder (Set)	C02180-751-09-01	1
4	Cushion Washer 6.1	N18200-806-01-01	4
5	Hex. Socket Bolt M6x25	N18230-206-16-02	4
6	Hex. Nut M6	N18214-406-00-01	4
7	Feed Bolt	C02180-592-02-00	1
8	Slides Set: 15°-60°	C02180-753-40-00	1
9	Spindle Housing: 15°-60°	C02180-752-60-00	1
10	Sliders Mounting I 15°-60°	C02180-753-40-10	1
11	Sliders Mounting II 15°-60°	C02180-753-40-20	1
12	Hex. Socket Bolt M8x16	N18230-208-20-12	2
13	Split Lock Washer 8.2	N18200-808-02-01	2
14	Round Washer 8.4	N18200-608-04-01	2
15	Guide Slide I	C02180-593-03-00	1
16	Hex. Socket Bolt M5x10	N18230-205-10-12	8
17	Guide Slide II	C02180-753-07-01	1
18	Hex. Socket Bolt M5x10	N18230-205-10-12	4
19	Roller Set	C02180-753-07-30	2
20	Round Washer 8.4	N18200-608-04-01	2
21	Split Lock Washer 8.2	N18200-808-02-00	2
22	Handle Assy M8x20	H00643-483-01-00	2
23	Milling Head Arbor	C02180-594-01-00	1
24	Motor Key	C02180-754-02-00	1
25	Milling Head .12" (3.1 mm) (2pcs in set)	PBM-2041	1 Set
26	Milling Head Key	PBM-2042	1
27	Distance Ring	C02180-594-05-02	1
28	Insert Screw	PBM-2052	12
29	Milling Insert	PBM-2051	12
30	Washer	C02180-594-11-00	1
31	Safety Washer	PBM-2043	1
32	Bearing Nut KM-4	PBM-2044	1
33	Split Lock Washer 6.2	N18200-806-01-02	1
34	Hex. Socket Bolt	N18230-206-30-02	1
35	Controller Cover	C02180-755-19-00	1
36	Snap Bushing LA 10	H01370-001-01-10	1
37	Internal Insulation	C02180-755-23-00	1
38	Capacitor 30NF/240V	H01111-001-01-04	1
39	Seal Ring	H01370-020-01-00	2

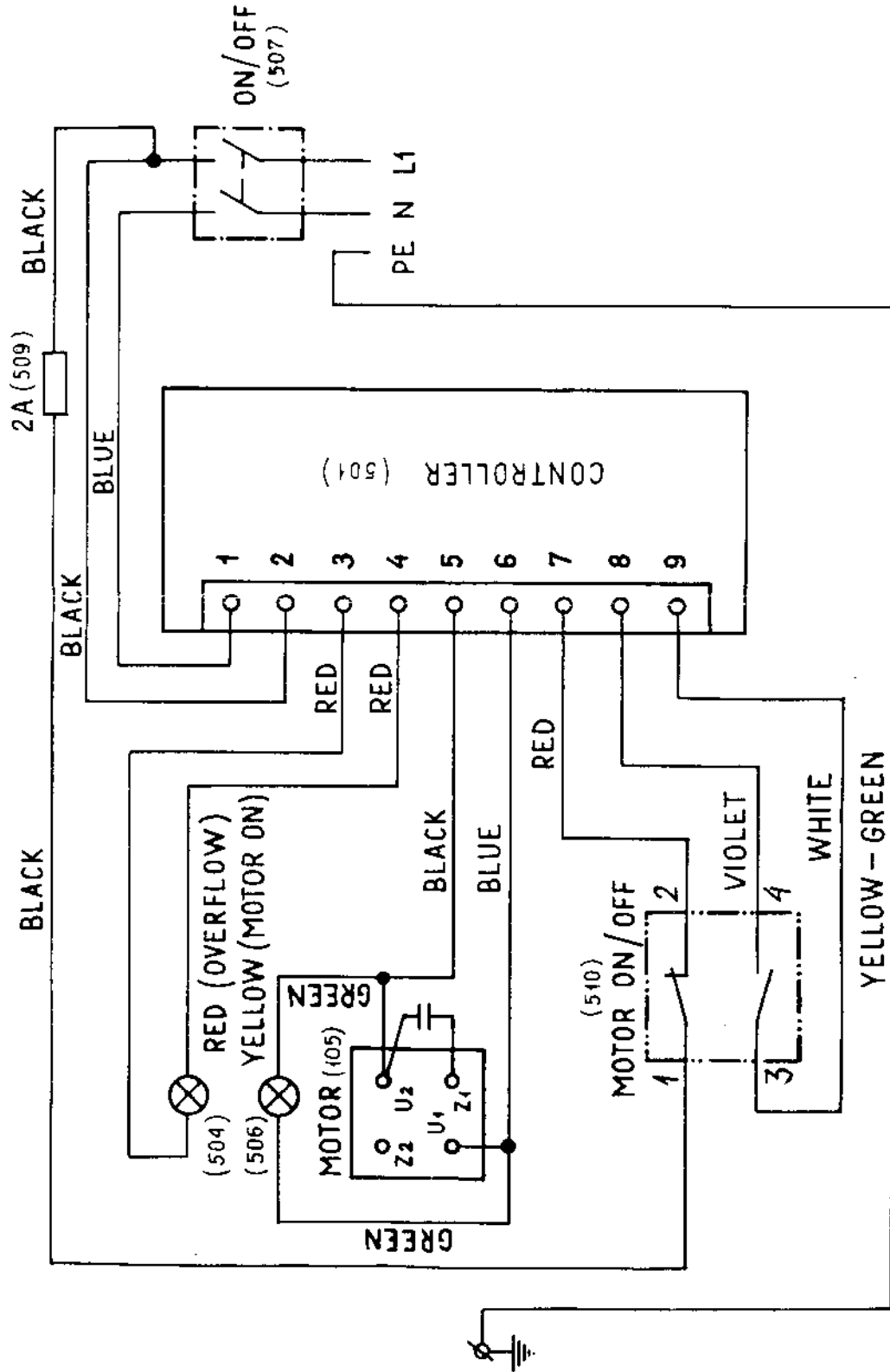
40	Hex. Nut M8	N18214-408-00-01	1
41	Spring Washer 8.3	N18202-408-04-01	1
42	Spring Washer 4.1	N18200-804-01-01	2
43	Screw M4x12 Cross Recessed	N18220-104-12-00	2
44	Seal L=120	H01369-010-01-02	1
45	Strain Relief	H01131-133-02-02	1
46	Strain Relief Nut	H01131-133-03-02	1
47	Power Cord w/Strain Relief 230V	H01126-351-01-00	1
	Power Cord w/Strain Relief 120V		1
48	Seal L=520	H01369-010-01-02	1
49	Cover (Upper)	C02180-755-08-00	1
50	Electronic Module 230V	C02180-756-00-01	1
	Electronic Module 120V		1
51	Red Light Indicator	H00917-001-01-02	1
52	Amber Light Indicator	H00917-001-01-01	1
53	Main Switch	H01115-168-01-01	1
54	Switched Fused Chassis Plug	H01115-169-01-01	1
55	Cover Insulation	C02180-755-24-00	1
56	Motor ON/OFF Switch Nut	H01115-166-01-03	1
57	Fuse Socket	H01156-114-01-04	1
58	Fuse	H01156-113-01-05	1
59	Flt Hd Slit. Screw M4x10	N18221-204-12-01	4
*60	Tool Box	C02180-596-01-00	1
*61	Hex. Wrench. S=6	H00643-506-01-00	1
*62	Milling Head Fastening Tool	C02180-596-04-00	1
*63	Hex. Wrench. S=3	H00643-434-01-00	1
*64	Milling Head Interlock	C02180-596-06-00	1
*65	Milling Head Puller	C02180-596-07-00	1
*66	Edges Planning Set	C02180-753-20-01	1
*67	Pipe Beveling Attachment	PBM-2100	1
*68	Radial R3 Set	C02180-594-20-00	1

*Items not shown on exploded view drawing.

EXPLODED VIEW



ELECTRIC DIAGRAM



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 neglect, 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 dealer/distributor. 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.