

Brushing Machine RBM300

Translation of the Original Instructions



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Leaflet

Good wet brush machines for printed circuit boards at modest prices are possible! You can see that our model RBM 300 BLC (Benchtop Low Cost). This machine is a the smaller sister of the RBM 402 series, and is cost reduced where ever possible. But of course not in regard of quality, durability and the with precision executed detailed solutions.

Features:

- The RBM 300 has an oscillating brush with quick change holder.
- Brush, dryer, oscillation, and transport can be switched on and off separately.
- In addition the oscillation frequency of the brush and the speed of the conveyor are step-less adjustable.
- The double side parallel adjustment of the brush is of great importance, because in contrast to the widely used single side brush adjustments only the mutual parallel adjustment will enable a long lasting uniform brushing result.
- The machine can be equipped with various brushes so that finishing pcbs before laminating is possible as well as slight deburring after drilling can be fulfilled.
- The usable width is 300 mm.
- In spite of its small size the RBM 300 comes with a complete squeeze off and hot air drying zone behind the wet processing brush zone.
- The integrated frequency converter allows the machine to work worldwide with all power supply systems and enables smooth start and enhanced motor protection.
- Being simply a table size model the RBM 300 lacks only the integrated rinse water treatment of its bigger sister, the RBM 402. A separate rinse water treatment tank is available as an option.

Technical Data

Electrical Connection:	110 - 230 V, 50–60 Hz	Infeed per turn of hand wheel:	ca. 1 mm
Dimensions (L x W x H):	760 x 590 x 415 mm	Brush length:	310 mm
Working width:	300 mm	Outer diameter brush:	89-91 mm
Board thickness (rigid boards only):	0,3 - 3 mm	Inner diameter brush	35 mm
Brushing speed :	1360 RPM	Water inlet:	Spout D30mm
Oscillation stroke :	10 mm	Water outlet:	Spout 32 mm
Oscillation frequency:	ca. 10 - 110 H/min	Water pressure:	
Conveyor speed:	ca. 0,2 - 2 m/min	Board size (minimum):	80 x 160 mm
Weight:	80 kg	Brushing roller stroke:	max. 20 mm

Technical details are subject to change without notice.

EG-Declaration of Conformity



EG-Konformitätserklärung/Declaration of Conformity

Hersteller / Supplier:	Bungard Elektronik GmbH & Co. KG Rilkestraße 1 51570 Windeck Germany
Bevollmächtigte Person für die Zusammenstellung der technischen Unterlagen: Person in charge	Jürgen Bungard, Geschäftsführer /general director Rilkestraße 1 51570 Windeck Germany
Produkt:	Brushing Machine RBM300

Hiermit erklären wir, dass die oben beschriebenen Maschinen allen einschlägigen Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

Die oben genannte Maschine erfüllt die Anforderungen der nachfolgend genannten Richtlinien und Normen:

We hereby declare that the machines described above complies with all relevant provisions of the Machinery Directive 2006/42/EC.

The above machine meets the requirements of the following guidelines and standards:

- **Maschinenrichtlinie 2006/42/EG / Machinery Directive 2006/42/EC**
- **EMV-Richtlinie 2014/30/EG / EMC Directive 2014/10830EC**
- **Niederspannungsrichtlinie 2014/35/EG / Low Voltage Directive 2014/35/EC**

- **DIN EN 60204-1** Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen / Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- **DIN EN ISO 14121-1** Sicherheit von Maschinen - Risikobeurteilung - Teil 1: Leitsätze / Safety of machinery - Risk assessment - Part 1: Principles
- **DIN EN ISO 12100-1** Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze, Risikobeurteilung und Risikominderung / Safety of machinery - Basic concepts, risk assessment and risk reduction
- **DIN EN 55014-1 2012-05** Elektromagnetische Verträglichkeit, Anforderungen an Haushaltsgeräte, Elektrowerkzeuge und ähnliche Elektrogeräte, Teil 1: Störaussendung / Electromagnetic compatibility Requirements for household appliances, electric tools and similar electrical appliances Part 1: Emission
- **DIN EN 55014-2-2009-06** Elektromagnetische Verträglichkeit - Anforderungen an Haushaltgeräte, Elektrowerkzeuge und ähnliche Geräte - Teil 2: Störfestigkeit - / Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity
- **Niederspannungsrichtlinie / Low Voltage Directive 2014/35/EG**
- **Maschinenrichtlinie / Machinery Directive 2006/42/EG/37/EG**

Windeck, 10.1.2016

Jürgen Bungard Geschäftsführer

Intended Use of Machine

The system is designed for brush cleaning of printed circuit boards.

All other applications require our written consent or happen on full risk of the user.

The Bungard GmbH & Co. KG accepts no liability for damages incurred in non-authorized use or application of the machine.

Safety Instructions

General

Please read the following instructions carefully and pay particular attention to information on operating safety and set up.

Keep these instructions at a safe place. It contains information which also refer for later maintenance and cleaning.

The machines are intended for physical treatment of printed circuit boards.

The machines are not designed to be embedded or interconnected with other machines or systems. They may only be used in specially equipped rooms and be operated only by qualified staff. Children and pets are to be kept away!

Transport

Only use suitable lifting and transport equipment such as forklifts or pallet lifts. Secure the machine against sliding / tilting.

Place of installation

The machine must be standing level and around the machine there has to be sufficient space for operation and maintenance work (approx 1m on all sides).

Do not place the unit in a location near heat sources such as radiators, hot air ducts, furnace and the like.

Do not run the machine in corroding, humid, dusty, extremely hot or explosive atmosphere. If you do run the machine in an atmosphere as described above be aware that this happens on your own risk and responsibility.

The operator has to provide appropriate safety precautions and equipment. We explicitly exclude any warranty for damages resulting from running the machine in an atmospheres as described above.

Electricity

The machine is made from certified parts according to standard practice for electrical safety. This does not relieve the user of his duty of care when handling electrically powered devices.

Connect the device only to the designated power supply as indicated in this manual or on the machine plate.

The red main switch disconnects the machine from the power supply. We presuppose that the safety fuses of the circuit and the residual current circuit are provided by the building's power supply. After completion of work, the main switch should always be turned off.

Before all maintenance work on the machine (filling, emptying, cleaning, etc.) turn off machine and pull the plug.

To avoid the risk of electric shock, do not remove the casing or open the back. There are no user serviceable parts inside. Leave servicing to the experts! Keep this unit out of the rain and away from moisture.

Pay attention to the warning signs on the machine. If you are not going to use the unit for some time, remove the plug from the socket.

Water connection

After work or prolonged interruption, close the cock valve of the building's water supply to prevent water damage from a possible leak in the hose.

Personal protection equipment

Do not touch heating elements and tubes. Danger of burn!

Rinsing water

The legislation generally prohibits to exceed certain maximum concentrations and quantities of copper (and other heavy metals) in the waste water (usually 0.5 mg copper / liter of water). After brushing the boards should not be rinsed under running water and do not dispose used rinsing water into the sewer! Operate the rinsing water only either in a closed loop rinse or treat the rinse water with a copper centrifuge or some special filter system. Metallic copper will be hardly removed in a ion exchanger system.

We recommend to use the water in the closed loop rinsing zone(s) as long as possible.

Collect used rinsing water and dispose the surplus together with the used chemicals.

Maintenance

The unit should only be maintained and repaired by qualified personnel. Never try to do more in the way of maintenance to your unit than the operating instructions allow. Beyond that, always consult an expert for repair work.

When changing the brush you must pay attention to the correct rotating direction of the brush.

For security reason, brushing rollers can only be activated if top cover is closed.

Attention: Do not start brush motor when brush is under load.

Set Up

Check packing and machine for transport damages. If such appear inform your transport agent, your local dealer immediately and us and remark the damage on the transport papers.

Unpack the machine at its final location. The RBM 300 requires a flat, level surfaced table.

To enable easy changing of the brushes later on we recommend to not place the machine directly next to a wall.

The delivery contains a grinding board to level the brush, a power cable, a wrench SW17 for the brush spanning roller, a wrench SW41 for the brush take up roller, an Allen key 3 mm for screws of hand wheel and side walls, the spouts for the water connections and a grey cover for the brush.

For easy transport the hand wheel for adjusting the brush is not yet mounted. Please mount this wheel first and tighten it with the Allen Key screw.

The power connection must be in accordance to the details on the information plate and you local standards.



The RBM 300 is equipped with a frequency converter, which makes the machine suitable for all power systems world wide and enables a smooth start function as well as a motor protection against overload. The machine is delivered with power cord and safety plug.

The water supply for RBM 300 requires a stop valve and a pressure reducer (maximum pressure for rinsing system: 1,5 bar). We recommend fiber reinforced PVC-tubes without silicone residues. The tubes must fit for inlet on a 20mm spout and for the machine outlet on a 32mm spout.

The discharge must be trapped but has to avoid back draughts. Please consider your local environmental laws. In many countries you may not directly pour the rinse water into the drain but rather preset a filtration.

As an option we offer a closed cycle rinsing module, which filters the rinsing water and pumps it back into the machine. If you have a closed -loop rinsing tank, connect this tank with the above mentioned tubes, make the power connection (there is a socket underneath the RBM300!) and fill the tank with water.

After machine is installed correctly and according to local regulations, check machine functions. Check that all switches (for brush, dryer, conveyor, oscillation and mains) are off.

Check if brushing roller is fixed correctly. If not, fix it hand-tight with the included socket spanner. Now switch on mains. The lamp should be lit.

Distance of brushing roller is preset to maximum. Setting may be modified by means of the hand wheel. Feed motion of brushing roller is clockwise. 1 mm infeed increment per 360° turn of hand wheel.

For security reason, brushing rollers can only be activated if top cover is closed. Turn on brush. Attention: To avoid damage to the motor and extreme mechanical wear do not start the brush under load.

Switch on oscillation. Check that oscillation speed may be varied with potentiometer.

Switch on conveyor and check if rollers are turning correctly and speed may be varied with the potentiometer.

Switch on dryer. Attention, do not touch heating elements and tubes. Heating-up time has to be approx. 3 min.



Operating

Surface quality

The RBM is equipped with medium fine brushing rollers for deoxidisation and soft burring. The surface quality is a function of different parameters such as pressure, oscillation, conveyor speed, material quality and requirement of the job (deoxidisation, polishing, burring). Optimised presetting has to be found by individual tests.

Presetting of RBM

Turn on the main switch. Adjust distance of brushing roller to maximum possible values. Turn on brushing rollers and oscillation. Adjust pressure according to board thickness. For pressure adjustment we recommend a PCB of 200 mm and minimal length of 250 mm.

Enter board and modify the distance of brushing roller so that pressure is sufficient to clean the surface softly. You can hear the motor load increasing as soon as the brush touches the board.

Normally it is sufficient for PCB processing to work with low pressure to remove oxides and to have a good base for PTH or photo laminating. Deep scratches in the PCB surface can be removed by reducing the speed and brush more than one time rather than increasing the brush pressure.

Drying

The dryer consists of a mechanical and a hot-air drying compartment. Drying efficiency is best at low conveyor speed. Important for good results is that the drying clothes are in a good condition. They have to be exchanged from time to time. Moist clothes work better than totally dry ones. If the pcb shall leave the machine completely dry you have to reduce the speed to minimum. You can post dry the board by putting it on the heat grid sheet.

Maintenance

Exchange of brushing roller

Lift brushing roller by turning the hand wheel counter-clockwise. Demount the grey cap on the machine's side. Notice the exact position of all parts you disassemble. This will simplify the reassembly to a great extent. Open top cover of the machine.

Block the brushing roller manually and loosen full floating axle **clockwise** (left-handed thread !) until you can pull it off.

Take out brushing roller and dismount the shaft nut with special 41 mm wrench. Insert shaft into new brushing roller and fix it. Attention: take care of the sense of rotation, marked on the brush.

Insert complete unit into the machine. Insert full floating axle, fix it hand-tight by turning counter-clockwise. Close top cover. Grind brushing roller if necessary.

Exchange of drying clothes

Clothes are changed upon need.

Switch off dryer and let it cool down. Demount the heat grid sheet by loosening the 4 Allen key screws.

Dismount upper dryer cover and squeeze roller. Remove old drying clothes and clean rollers. Fix new double sided scotch tape on the lower roller. Put tissue on adhesive tape, use the conveyor system to roll it up.

Apply double side adhesive tape to upper roller. Cover upper roller with cloth. Roll up cloth and insert upper squeeze roller into machine.



Bearings

All friction bearings have to be oiled. Worm gear pair of brushing roller lifts have to be greased. Attention: full floating axle of oscillation system is fitted with silicon based sliding bearings that should not be greased nor oiled.




Grinding in of brushing rollers

New and / or worn out brushing rollers have to be ground by use of the included rubbing plate.

Insert rubbing plate (rough side top) so that plate is fixed by one pair of press rollers each left and right to the brush. Stop conveyor. Activate rinsing. Switch on brush rotation and oscillation. Feed brushing rollers by turning hand wheel clockwise until you hear the motor load increasing. Repeat until the brush surface is levelled over the entire working width. Turn on conveyor and drive out rubbing plate. Your brushing machine is ready for use now.



Spare Part List

6000	Programmierter Konverter für RB-M300	Converter incl. programming for RBM 300,	
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6000		Bürstmotor mit Halterung	Brushing motor with fixation	
680183		Zahnriemen für RBM 300	Belt for RBM 300 (
680184		Bürstwalze für RBM 300	abrasive roller for RBM 300	
680186		RBM 300 Platine für Antrieb/Oszillation	PCB for oscillation / transport of RBM 300	
690360		Kreislauffiltereinheit: Spülwassertank 30l max. mit	RBM recycled rinsing tank 30l w.pump+ filter	
	BM560207	Gehäuse-Seitenwand PVC blau 3mm	Side case for RBM300 PVC blue	
6000		PWM-Steuerung für RBM300 Nachrüstset für RBM300	PWM-control for RBM300, retrofit kit	
6000		PWM-Steuerung für RBM300	Take up system for Brush RB-M300	
6000	LM571830	Getriebemotor für Antrieb RBM300	Gear motor conveyor RBM300	
6000	LM571830	Getriebemotor für Oszillation RB-M300	Gear motor for oscillation RBM300	

Guarantee

All machines are submitted before distribution to examination on function and continuous operation firmness. On the machine we grant a work warranty of 12 months to our customers starting from purchase date on accuracy in material and processing. We warrant at our choice by exchange of incorrect parts or by repair of the machine in our house. Old parts change into our possession.

Disclaimer of Warranty

Bungard GmbH & Co.KG reserves the right to change or enhance its machines or machine specifications according to its judgement, if necessary. Bungard cannot be held responsible to implement aforesaid changes into machines sold already.

Bungard products and services are liable to the current prices and conditions, which are subject to change.

The instructions and definitions in this document are also subject to change and mark no assurance on the part of Bungard.

This manual contains informations of the Bungard RBM300 and is the translated English version.

Please regard the "Sales terms and delivery conditions". These are available after fulfilment of the contract. We don't furnish a guarantee or warranty in cause of damages at material or hurts of people because of

Incorrect use of the machine

Wrong setup, installing and operating of the machine or incapable service

Use of the machine with defective safety equipment

Non-observance of the service manual in regard to transport, stocking, setup, installation and service of the machine

Unlicensed modifications at the machine

Incorrect or incomplete repairs

Destructive force effect at the machine in cause of foreign objects or external use of force

Use of non-original spare parts

normal wear parts.

We cannot accept subsequent claims from damage or destruction of work pieces worked on in the machine, because we have no knowledge or control over the operating conditions at your site. This is valid in a general manner also for requirements from damage to articles, buildings and persons as well as the environment.

We do not warrant that the function of the machine will meet the customer's requirements or that the operation of the machine will to this regard be error free.

In no event will we be liable to the customer for any incidental, consequential, or indirect damages of any kind, including loss of profit and prosecution for environmental pollution, even if we could have been aware of the possibility of such damages.

All information was arranged with great care. We reserve ourselves however mistake and technical changes without previous announcement.

Running the machine in corroding, humid, dusty, extremely hot or explosive atmosphere happens at the operator's own risk and responsibility.

We explicitly exclude any warranty for damages resulting from running the machine in in corroding, humid, dusty, extremely hot or explosive atmosphere.

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