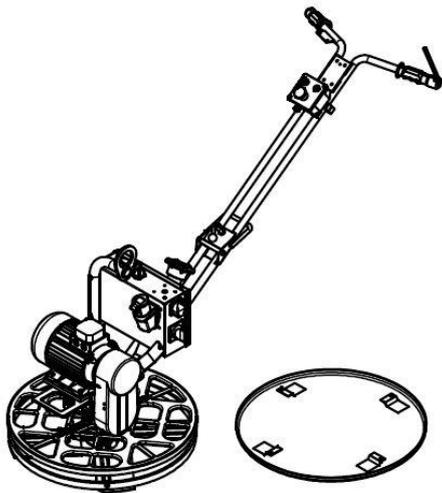


OPERATOR'S SAFETY AND SERVICE MANUAL



F24 Electric Trowel Machine



This manual covers the following serial numbers for each model listed:
F24.....1740814-174999

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This handbook contains operating and maintenance instructions of the Moskito Edging Trowel, model CE4-60.

Please keep it in a safe place. You may need to refer to it at a later date.

Follow these instructions carefully in order to become familiar with the trowel and to avoid problems caused by improper use.

To conform to the safety procedures, it is recommended that the operator wears safety devices such as safety shoes, soundproof devices, safety helmet and heavy duty leather working gloves.

The manufacturer reserves the right to change the contents of the handbook to improve the quality of the trowel without notice.

No part of this handbook may be reproduced or translated without written permission from MBW.

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	Attached: declaration of conformity, electrical schedule and spare parts list	

1. INTRODUCTION

The machine described in this instruction and maintenance manual is a patented mini trowel provided with a free wheel for floating and finishing concrete, epoxy floors and sub floors.

The trowel is equipped with 4 blades.

The power is transmitted from an electric engine of 220V or 380V through a V-belt to the gearbox. On request a speed variator can be mounted.

It is recommended not to use the trowel for any other purpose than what it is designed for, unless you have a written authorisation from MBW. In case of disposal of the machine it is necessary to respect the local environmental law.

2. TECHNICAL DETAILS

DESCRIPTION	Unit Measure	Code 3016
Overall dimensions	mm	600x1420x900
Operating weight	Kg	57
Disc diameter	mm	600
Number of blades	nr	4
Horsepower	Kw/HP	3.5HP
Starting	Type	Electric
Voltage	Volt	220V
Frequency	Hertz	50
Cooling	Type	Air
Engine speed	RPM	3600
Blade speed	RPM	130
Packing dimensions	mm	650 x 910 x 800
Shipping weight	Kg	64.52

Tests have been undertaken to determine noise and vibration levels and to evaluate the effect on the operator. The results are.

Noise and vibration levels in working conditions		
Average acoustic pressure	dbA	88.8
Average acoustic power	dbA	103.2
Acoustic pressure on operator	dbA	89.1
Value of vibration		
Vibration value on the handle	aw	7.0

3. GENERAL INSTRUCTIONS

3.1 Power to the trowel

Connection of the trowel must be done as described in the MBW handbook, but MBW is not responsible for the connection. For safety keep the following points in mind:

1. The power to the trowel is supplied by the electrical network at 220v.
2. The motion of the blades rotation of the trowel is given by the engine to a centrifugal clutch.

3.2 Safety precautions for the operator

To avoid slipping and loss of control of the trowel, when starting the engine, the operator must always maintain good footing. Be sure to maintain control at all times, to avoid possible damage or operator injury. On models equipped with a speed variator it is recommended to always keep the speed at minimum position during the starting operation.

Never start any maintenance or repair while the engine is still running. Be sure the power to the engine has been turned off and that the connection cables are unplugged.

Be careful when changing old blades for new. Due to the way the blades wear, the old blades become sharp like razor blades. Always wear heavy duty working gloves during the maintenance operation and pay special attention to the position of the blades.

Keep hands and feet away from rotating parts and make sure all safety protection is in place.

Before every working day check all power cables for damage such as cuts and peeled wires. Keep power cables and plugs away from water.

When finishing concrete above ground level or on floors with holes larger than 50x50cm, barriers should be installed as a protective measure. The barrier should be such that it will stop the trowel from riding over the edge of the slab in case of loss of control.

Make sure that nobody stands near the trowel when operating. To avoid unexpected contact with the rotating parts it is recommended to keep a minimum distance of 4 meters from the operator and the trowel.

Before every working day check the trowel thoroughly, and pay special attention for loose bolts and nuts. Be sure that the deadman switches on the trowel are working correctly.

Never lift the trowel by the rotating ring; use the handle provided on the trowel.

Use the trowel always on a flat level surface.

Do not wear untied clothes, bracelets or other flying objects during the working cycle.

Always wear protective devices such as gloves, safety helmet, safety shoes and others which conform to the safety regulations.

Always operate the trowel in well lighted areas.

When operation of the machine necessitates walking backwards, ensure that there are no obstacles in the walking area.

Do not allow minors or untrained people to operate the trowel and keep them away from the working area.

Store the trowel in a dry place away from rain and other atmospheric influences.

Be careful when running the trowel on areas where water has been applied because the trowel will tend to skate away. Maintain full control at all times.

When working on the floor with a trowel, be sure it is done in a safe way. Make sure there are no obstacles such as manholes or drain ducts on the floor slab, which can block the rotation of the blades.

4. STARTING THE TROWEL

4.1 Assembly

The trowel is delivered in a box completely assembled with the trowel arm folded.

Take the trowel out of the box and place it on a flat level surface to check it.

Contact our dealer in case of damage.

Unfold the handle and fasten the locking knob.

Dispose of the packing in accordance with the standards which are in force in your country.

When moving the trowel from one job site to another use a lifting device, connect hoist hook with hoisting device.

Never lift the trowel by the rotating ring.

4.2 Before starting

Before starting the trowel check the following:

The operator must be in good stability condition and must have a good point of support in order to avoid sudden movements and loss of control of the machine during the starting as well as during the working process.

Check the deadman levers are working properly and to do this the operator must keep tightly and firmly the handle of the trowel, on the contrary the operator could loss the control of the machine causing damages to people or things.

This check must be done on each start.

Never try to change the speed while the engine is stopped. Before stopping the engine always put the lever at the minimum speed.

4.3 Using the trowel

Guiding the trowel on the slab is very simple. Get into operator's position behind the centre of the handle and attain a good footing and start the trowel.

- Push handle down slightly and the trowel will move to the right.
- Lift handle up slightly and the trowel will move to the left.
- Push forward and the trowel will move forward.
- Pull backward and the trowel will move backward.
- Holding the handle in neutral position the trowel will remain stationary.

It is recommended to hold the handle of the trowel firmly during the work.

4.4 Stopping the trowel

Release the two deadman switches to stop the trowel. After the machine is stopped, disconnect the trowel to the electric network. The deadmen levers are connected to 2 micro switches that stop the electricity to the candles.

5. GENERAL USE

5.1 Preparation of concrete surface

Use a mechanical or air vibrating screeding machine to "strike" the concrete surface to level. This will provide good compaction to the slab and produce an ideal surface for finishing. It should be remembered that floating/finishing machines will not repair or correct a poorly screeded slab.

5.2. Floating operation

Before starting the floating operation, be sure the floating disc is correctly mounted underneath the blades. **PAY ATTENTION: THE ROTOR TURNS CLOCKWISE.**

The slab will be ready to work for the first floating operation when the heel of the shoes leaves a print of 2-3mm on the surface of the slab. During the floating operation the floating disc may not turn on the surface; if so this may be collected cement paste between the blades and the floating disc. If necessary clean the trowel as indicated in the next sections. After the floated slab has set and a footprint is slightly visible, it is ready to start the finishing operation. The timing of all these operations is dependent on weather conditions/ambient air temperature. After each operation the engine should be stopped. Never park the trowel with the engine running, especially during the floating operation when the concrete is relatively soft. The trowel should not run on the soft concrete in same spot, this could cause damage to the finished floor tolerances, producing dips or hollows.

**Never lift the trowel by the rotating ring; use the hoist hook or handle provided on the trowel.
Never leave the floating disc attached to the trowel when it is lifting more than 100cm. The floating disc could fall off.**

5.3 Finishing operation

After the floating operation the first thing to do is to remove the floating disc from the blades, and clean the blades and attaching blade disc of cement paste collected during the floating operation. Increase the blade pitch up to a maximum of 1 cm for the first finishing operation and then continue to increase the pitch on the following finishing operations. Continue the finishing passes until you obtain the desired floor finish. The time required between each finishing pass is again dependent on the weather conditions and water content of the concrete etc. If some areas of the concrete set / harden too fast you may apply a small amount of water using a hand brush as an aid to achieving the finish.

Be careful when running the trowel on areas where water has been applied because the trowel will tend to skate away. Be sure to maintain full control at all times.

5.4 Machine cleaning

Clean the trowel after it has been used to prevent the collection of hardened cement, which is very difficult to remove. It can be removed with an old paint brush or hand brush. After cleaning it is recommended to coat blades, blade arms and protection ring with stripping oil (do not use flammable oil), this will aid cleaning after the machine is used. Avoid spillage of oil on any rubber parts like V-belts etc.

5.5. Moving the trowel

When transporting the trowel on a truck, always keep the handle folded and the blades flat in order not to damage the blade pitch control system.

Always keep the floating disc underneath the blades, to protect them against damage.

6. MAINTENANCE

Before starting any maintenance or repair be sure that the power to the engine has been turned off and the connection cables unplugged. Make sure the trowel is clean before starting any maintenance. Always wear heavy duty working gloves during the maintenance operation and pay special attention to the position of the blades. In case of problems contact our technical assistance.

6.1 General maintenance

The trowel does not need any particular maintenance, however it is necessary to keep following instructions in mind:

DAILY CHECKS:

- Check daily the condition of the electric components, paying special attention to the electric cables and plugs.
- Clean the trowel at the end of every working day of cement paste collected while working.
- Check for loose bolts on the blades and tighten if necessary. After daily cleaning is done attach the floating disc to the trowel to protect the blades during transport.
- Check the deadman lever.

CHECKS AFTER 100 HOURS WORKING:

The oil level in the gearbox; on the box there are two plugs; the one on the top measure the oil level. Pay attention if you notice oil in the lower part of the trowel; in case, clean and check where it may come out and make the proper checking. Contact our technical assistance or a qualified technician. If the grease in the gear box has to be changed or filled up use **TEXACO MEROPA 220** or similar type. Never mix mineral oil with synthetic oil.

ANNUAL CHECKS:

The trowel, after the warranty, must affect annual check on all the safety systems and protection, by MBW authorised workshops or dealers. Otherwise MBW will not be responsible.

6.2 Changing floating disc

After the trowel has been cleaned of any cement paste collected during the work, take out the floating disc from the fastening points.

Before mounting the disc ensure the blades and the floating disc are clean of any cement paste.

Put the floating disc on a flat level surface and be sure the blades are in a horizontal position.

Place the trowel over the disc, so that the finishing blades are pushed in to the two (2) square lugs on the floating disc.

6.3 Changing blades

Check if the blades are bent or worn.

Follow instructions below to change the blades:

- Clean the blades of hardened cement paste collected during the work.
- Remove bolts and lock washers on each trowel arm.
- Mount new blades and check all bolts and washers; replace if necessary and fasten securely.
- Tighten bolts on blades every day.
- If blades show different wear patterns, replace all the blades for better performance of the trowel.

6.4 Changing V-belts

Undertake the following steps to change the V-belts:

- Clean the trowel of any cement paste collected during the work.
- Take the belt guard off by untightening the bolts of each side of the belt guard.
- Replace the V-belts with same size and brand. This is very important, there might be a difference between one brand and another.

Once the power trowel guarantee has expired, the machines should be subjected to a complete check-up once a year. You can address to all our authorized dealers all around the world.

MBW will refuse all responsibility in case of incident whenever the check-ups won't be done.

7. TROUBLESHOOTING AND REPAIR

Before any maintenance or repair be sure the power to the engine is turned off and the connection cables unplugged. It is recommended to effect only the operations described in previous sections. Contact our technical assistance for all other repairs.

TROUBLE SHOOTING	CAUSE	REMEDY
The rotor does not turn as fast as it should	V-belt slack or worn out	Replace V-belt
Trowel does not work properly	1) Blades excessively worn 2) Floating disc not evenly attached to the blades	1) Replace blades 2) Check if there is any hardened cement on spider plate or blades
Trowel leaves swirls on concrete	1) Hardened cement paste on blades or disc 2) Blades or disc worn out or bent	1) Clean blades or disc of cement paste 2) Change blades or disc
Vibration on the trowel	Loose bolts or nuts on engine or other parts of the trowel	Check for loose bolts or nuts and tighten if necessary
Trowel jumps on the floor	1) Trowel arm bent 2) Blades out of adjustment or bent	1) Replace trowel arm 2) Adjust blades and replace bent blades
Pitch control does not work	1) Trowel arm bent 2) Hardened cement on spider plate 3) Handle knob dirty or jammed 4) Yoke arm broken	1) Replace bent arm 2) Clean spider plate of hardened cement 3) Clean handle knob 4) Replace yoke arm
Engine won't start	1) Plugs defective 2) No power on line 3) Fuses burnt out 4) Deadman switch broken or disconnected wire	1) Replace plugs 2) Check all switches 3) Replace fuses 4) Replace deadman switch or connect wire
Deadman off trowel won't stop	1) Loose wires 2) Micro-switch burnt out	1) Connect wires 2) Replace micro-switch

8. WARRANTY

New machines sold by the Company are covered by warranty with regard to the structure and the use of proper materials under following terms:

- 1) The warranty is valid for twelve (12) months.
- 2) The manufacturer undertakes to repair or replace at its discretion those parts or assemblies which it deems to be defective.
- 3) Parts repaired or replaced are covered by the same warranty as original parts, which expires twelve (12) months after installation.
- 4) The manufacturer reserves an adequate period of time to carry out the necessary work and for the delivery of the spare parts.
- 5) Transport costs of replacement parts covered by warranty will be charged to the purchaser.
- 6) This warranty expires if the product is repaired other than by authorised staff during the warranty period.
- 7) Replaced parts during the warranty belong to the manufacturer.
- 8) Any components furnished by the Company but manufactured by others are warranted to the extent of the original manufacturer's warranty to the Company. Any claims will be handed over to the buyer.
- 9) This guarantee is for the sole benefit of the original buyer. Our responsibility under this guarantee ends in case:
 - a) The buyer transfers ownership of the trowel;
 - b) Makes any changes in the trowel;
 - c) Or adds parts or devices not of our manufacture to the trowel.
- 10) MBW will not be responsible for damage to floors which might arise from improper use of the machine, or for any other reason that the machine is stopped during the working cycle.
- 11) This warranty does not cover any damages arising from an excessive stress, for instance when the machine operates after the occurrence of a defect, or from improper use or maintenance, use of improper materials and failure to comply with the instructions for use. The same is valid for damage caused by normal wear and tear.
- 12) The manufacturer shall have no liability for any difficulties arising in re-selling or using broad due to provisions for the protection of patent rights in force in the country where the machine is sold.
- 13) With regard to engines, the terms of warranty of the original manufacturer are valid.
- 14) The terms of warranty set forth are binding for all MBW Dealers. Any different agreement will be valid only prior to written confirmation by MBW.

<p>Important to buyer: Always keep this guarantee as a reference and give model number, serial number and/or engine number when writing regarding your trowel. It will greatly facilitate rapid service.</p>

9. MARKING AND CERTIFICATE

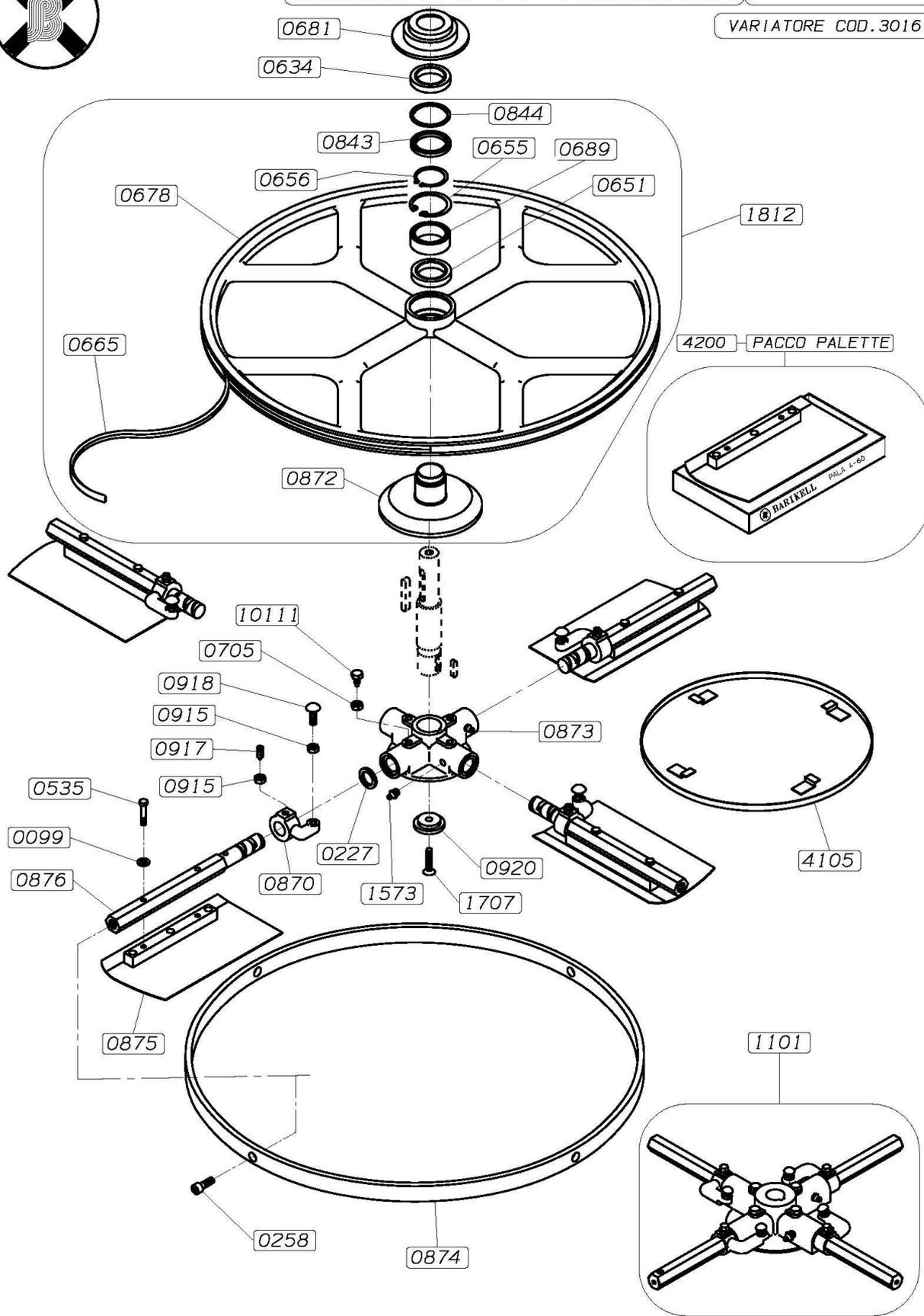
The models described in this instruction and maintenance manual have been checked to conform to the machine directives CEE 89/392 including the successive modifications.

The qualification is issued on the CE-label on the machine and on the declaration of conformity which goes together with this handbook.



MOSKITO 4-60 VARIATORE TAVOLA B

VARIATORE COD. 3016





VARIATORE

SCHEMA ELETTRICO VARIATORE

