

VERSION BRUSHES PENDULUM

USE & MAINTENANCE MANUAL

General Features



WARNING:

Please read these instructions carefully before using the machine and keep them safe for future use

Compiled according to Machinery Directive 2006/42/CE, Annex I, point 1.7.4

MACHINE DESCRIPTION

Cattle Brushing Machine (BRUSH) Pendulum

Description:

The AGRICOW BRUSHING MACHINE has been designed to facilitate a more hygienic and efficient cleaning of cattle, while rationalising costs with respect to traditional manual cleaning.

AGRICOW owns Italian patent No. BS2005A000032, relating to “Apparatus for brushing cattle” and the equivalent European patent No. EP 1665927 B1 valid in the member states of the European Patent Convention.

The cattle brush is:

- safe for the animals and persons working in the shed
- easy to install, not requiring brickwork
- easy to use
- operated at low energy cost (0.55 Kw)
- reliable and easy to maintain

In compliance with current standards for the safety of persons and things, the machine has been designed to conform with the applicable requisites as stated in Directive 2006/42/CE issued in May 2006.

As prescribed in the aforementioned standards, the machine is supplied with:

- Declaration of Conformity issued by the Manufacturer;
- CE marking;
- Identity plate showing:
 - Name of manufacturer
 - Place where machine was made
 - Machine type and serial number
 - Year of construction

Technical data:

	Pendulum
Overall dimension	110x175h cm
No. motors	1
Voltage supply	220V – 110V
Frequency	50 – 60 Hz
Capacity	0.75 Cv
Consumption	0.55 Kw/h
Overall weight	80 kg
Brush dimension	50x100
Rotation time (preset)	Approx. 90 sec
Rotation speed	36 rev/min
Maximum power surges	0 A – 12 A effective
Operating temperature	-15°C + 55 °C
Motor protection	10 A fuse

USING THE MACHINE

Inspection and controls before use:

The machine is checked on Agricow premises before delivery as foreseen by internal procedures.

Use:

The cattle brush has been designed and produced for use as a system for cleaning the coat of dairy cows. One brush should be used for every 50/60 cows.

IT MUST NOT BE USED for any purpose other than cleaning the coat of cattle.**Activation:**

- When the animal pushes against the brush, a micro switch starts to turn the roller, which automatically proceeds to clean the animal without requiring assistance by staff.
- By means of the start motor contact, the board controls the start and end of a work cycle. When the device is started, the electronic board begins a brush rotation procedure which lasts 90 seconds. When the device is started again, the motor turns in the opposite direction to the previous cycle so the brush is used evenly.

CE DECLARATION OF CONFORMITY

(In compliance with the EC Machinery Directive 2006/42/EC e s.m.i., Annex II/A)

The company **AGRICOW Srl** - Via Caduti del Lavoro, 88 - 25013 Carpenedolo - (Brescia) Italy



Declares, on its own responsibility , that the machine

CLEANING BRUSH MACHINE

Description : Brush machine for the automatic cleaning of cattle coats

MODELS:

SINGLE BRUSH MOONBRUSH	SINGLE BRUSH TOY	PENDULUM BRUSH	DOUBLE BRUSH
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Year of construction : 2005

The machine complies with the requirements set out in the Directive 2006/42/ CE and subsequent amendments and additions , enforced in Italy with Legislative Decree dated 17/2010 – Machinery Directive .

It complies with the following standards and directives:

Electromagnetic-compatibility European Directive 2014/30/UE;

European Directive 2014/35/UE on low.voltage electric compatibility :

EN 12100:2010 Safety of machinery – Basic concepts, general principles for design - Risk assessment and risk reduction;

Name and address of the person authorised to compile the technical file;

Name and Surname: Alberto Musicco

Address : Via Caduti del Lavoro, 88 - 25013 Carpenedolo - (Brescia) Italy

Carpenedolo (BS) li 1 Ottobre 2018

Alberto Musicco
(Legale Rappresentante)

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Modello: SINGOLA <input type="checkbox"/> DOPPIA <input type="checkbox"/> PENDOLARE <input type="checkbox"/>			
Anno di costruzione: 20 ____		Matricola: _____	
220V 50Hz <input type="checkbox"/>	60Hz <input type="checkbox"/>	Kw 0,37 <input type="checkbox"/>	Peso Kg. 77 <input type="checkbox"/>
110V 50Hz <input type="checkbox"/>	60Hz <input type="checkbox"/>	Kw 0,74 <input type="checkbox"/>	Peso Kg. 150. <input type="checkbox"/>

The identification plate with CE marking shall be affixed visibly, legibly and indelibly on the carpentry parts of the machine

SAFETY INSTRUCTIONS

ENSURE THAT THE DEVICE IS ONLY USED BY PERSONS WITH ADEQUATE TECHNICAL SKILLS. The operation, maintenance and start-up of the machine must only be carried out by trained and authorized personnel.

KEEP CHILDREN AND THE ELDERLY OR INFIRM FAR FROM THE DEVICE.

FOLLOW THE SAFETY AND MAINTENANCE INSTRUCTIONS.

RESIDUAL RISKS

Risks for persons:

The safety of persons and things can be compromised if, while the machine is running:

- Covers provided for moving parts are opened.
- Safety systems are removed.
- Any damage to the control system is not repaired immediately.
- The electronic board is modified by unauthorised staff.
- The machine is started, for a test or demonstration, before being accurately fastened to the support structure.

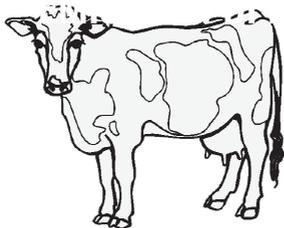
Care must also be taken to prevent risks to persons and things as summarised below:

- Avoid damage to the machine assembly, commands and brush during transport and handling before installation.
- Any kinds of interventions on the machine must only be carried out when the machine is switched off.
- Do not move close to the machine with open garments or long hair untied
- Install the machine in a well-ventilated space far from sources of electromagnetic pollution.
- Train assigned staff on how to use the machine and carry out maintenance.

Risks to the animals:

Thanks to its electronic control, the cattle brushing machine is safe for the animals. The aspects characterising this safety are:

- Motor force control
 - The motor's maximum tractive force is programmed to control any critical situations for the animal such as, for example, the tail becoming trapped in the roller.
- Inversion of rotation when meeting resistance in the presence of an obstacle
 - If the maximum force is exceeded, the brush inverts direction and rotates in the opposite direction for 1 minute, after which it returns to rest position.



Warning: The length of the end part of the cow's tail should NOT exceed 5-10 cm

PRODUCTION OF NOISE

Not significant in the working area.

WARRANTY

The warranty is valid for 24 months or 10,000 hours of machine operation. The warranty period begins on the delivery date of the machine.

The warranty issued by Agricow applies to the mechanical and electrical parts of the brush, including the:

- 1) motor
- 2) gearbox
- 3) electronic board
- 4) sensor

This warranty covers the repair and/or replacement of parts damaged due to an **ascertained material fault or construction defect**.

The part whose replacement or repair is claimed must not be returned to Agricow to be checked without its prior consent. The checks and verification of the anomaly will be carried out by the specialist personnel in charge.

Mechanical parts of the brush, such as motors and gearboxes out of warranty must be disposed of locally and should in no way be returned to Agricow.

The warranty excludes the costs of labour incurred from customer service for the replacement of faulty components or costs incurred for travel to the customer site.

The replacement or repair will be carried out in the shortest time possible, subject to written notice, consistent with the commitments of the manufacturer and its organized persons, with no obligation to provide compensation and/or reimbursement for direct or indirect damages.

The warranty excludes breakdowns due to transportation by any means other than AGRICOW vehicles, poor or incorrect connection or connection to electrical systems with insufficient flow, failure to comply with the provisions regarding the installation of the brush, failure to perform the periodic maintenance, negligence or inability to use, tampering by non-authorized personnel and, in any case, caused by persons other than AGRICOW employees.

The transport costs and risks for repairs will be entirely borne by the user.

The warranty becomes automatically void if:

- 1) The machine is used for purposes other than those for which it is intended, that is, the cleaning of the coats of cattle.
- 2) Non-original spare parts are used.
- 3) Changes are made to the machine without the written consent of Agricow.
- 4) The dedicated magnetothermal differential switch has not be installed.
- 5) The brush is used for more than 50-60 cows.

THE WARRANTY ONLY COVERS BREAKDOWNS REPORTED IN TEXTUAL FORM, THAT IS, IN WRITING, VIA FAX OR E-MAIL WITHIN THE VALIDITY PERIOD OF THE WARRANTY. ONCE THE VALIDITY PERIOD HAS EXPIRED, REPORTED BREAKDOWNS WILL NOT BE ACKNOWLEDGED.

Claims concerning the parts of the brush covered by warranty under the aforementioned terms will only be considered if accompanied by the following documents:

- A copy of the invoice showing the date of delivery to the end customer:
- Serial number of the brush, shown on the label bearing the AGRICOW trademark
- Photo of the motor and/or gearbox label; photo of the electronic card bearing the sensor error number.

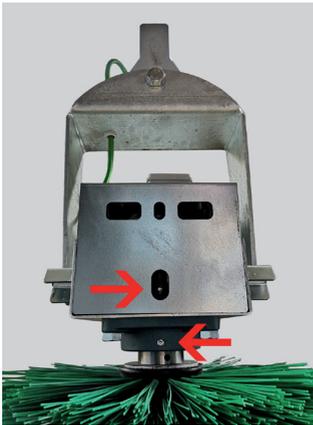
It is also understood that AGRICOW is not liable for any direct or indirect damages caused to persons or things by defects and breakdowns of the machine or resulting from forced suspension in its use.

PERIODIC MAINTENANCE

Maintenance foreseen:

All maintenance operations on the machine must be carried out with the power supply switch turned off. The inside of the machine must not be cleaned with jets of water, which would compromise the electric components, but using compressed air and brushes.

The machine body must be cleaned each month, removing any residue, and the bearings must be greased using a normal commercially-sold lubricant.



Greasing Points

INSTALLATION AND ASSEMBLY

Assembly instructions:

The installation of THE Pendulum BRUSH consists of mounting it to the wall/girder using specific fastening systems, followed by connection to the electrical system, which must be carried out by qualified personnel.

Optimal positioning and stable fastening are particularly important for the correct operation of the Agricow pendulum brush. It is thus important to ensure that the mounting surface is stable and not exposed to vibrations or movement.

Agricow advises against outdoor installation. Should this be necessary, it is mandatory to shelter the box containing the electronic board and the box containing the sensor from rain or excessive sunlight.

CAUTION:

The brush MUST be installed with the dedicated magnetothermal differential switch.

The procedures for installing the Pendulum brush are shown below.

The roller can be inserted in either direction.

The Pendulum brush is supplied with the machine body completely assembled and ready for installation, excluding the assembly of the:

- SUPPORT BRACKET, WHICH MUST BE FASTENED TO THE WALL SO THAT THE BRUSH SUPPORT CAN BE HOOKED TO IT (Fig. 1,2,3,4)
- ELECTRICAL CABLE, TO BE FASTENED INSIDE THE CLIPS ALREADY POSITIONED ON THE ARM SUPPORT (Fig. 5)
- provide to keep at least 45 cm or 17,72" free between the existing cable and the first clip (fig.5).



Fig. 1



Fig. 2



Fig. 3

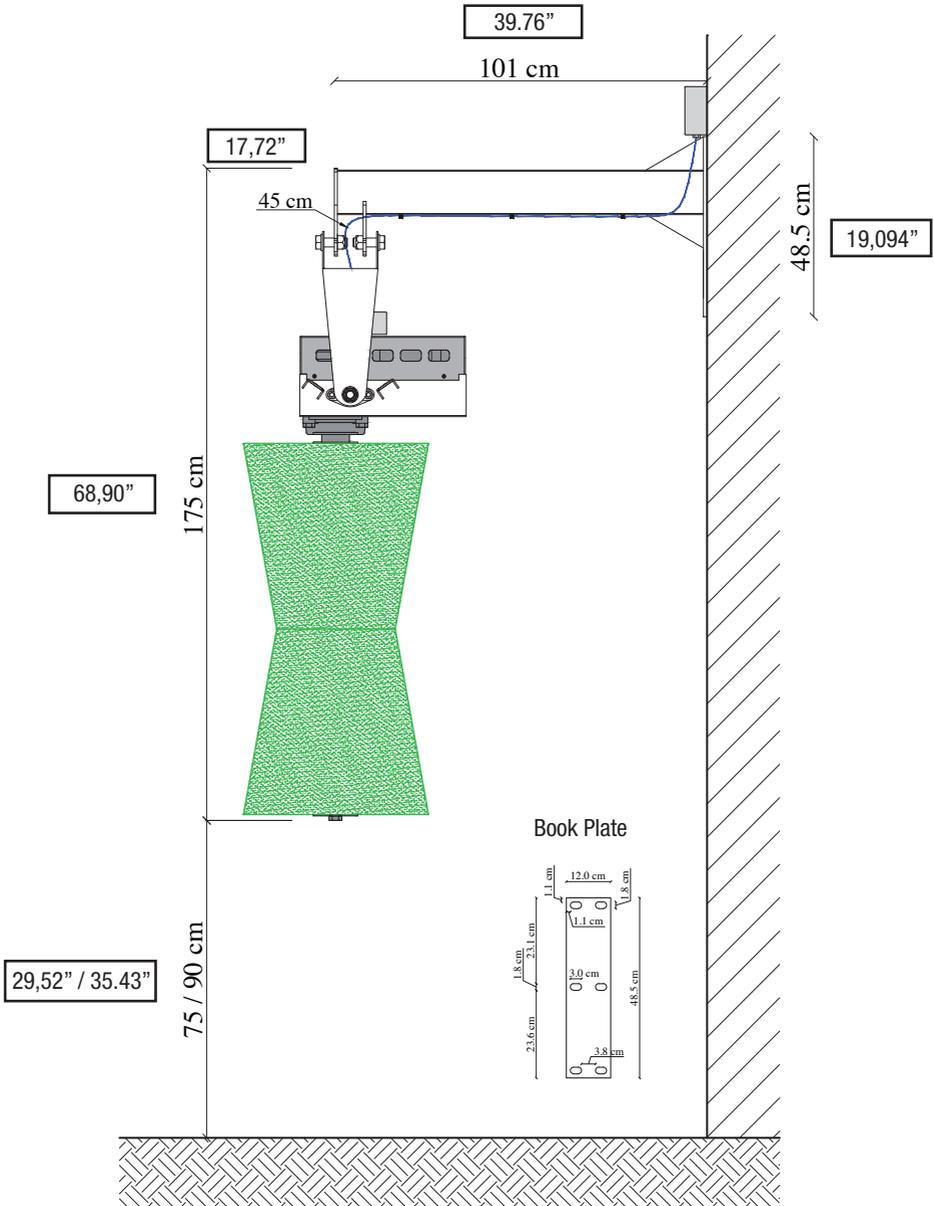


Fig. 4



cable free 45 cm / 17.72"

Fig. 5



Recommended installation height

ATTENTION: The height of the brush must accommodate the different shoulder's height of the animal (75/90 cm or 29,52"/35.43"). SEE PIC .

DESCRIPTION OF CONTROL PANEL AND DISPLAY

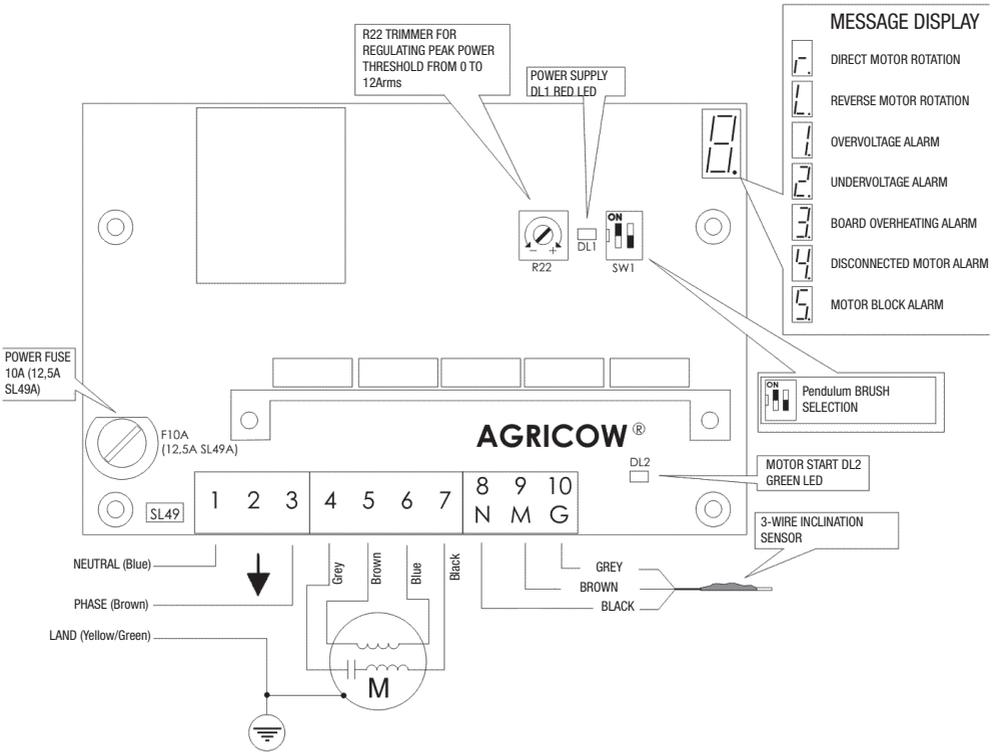
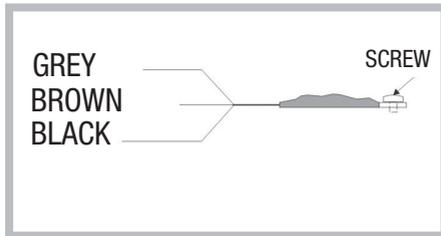


Fig. B Control Panel



3-wire sensor

Circuitry:

MEANING OF INITIAL DISPLAY MESSAGE SL49

Prior to being operational, the SL49 displays a set of characters with a given meaning which can be divided into four phases:

Number “**2**”:

Indicates that the board is ending an undervoltage procedure (it also appears when switching off).

Letter “**t**” followed by a number:

The “t” stands for “Trimmer” and corresponds to trimmer R22 for load adjustment.

The number indicates the load adjustment value. It varies between 0 and 255 (0 minimum load, 255 maximum load).

By default, it is set to a value ranging from 90 to 95 (92 is ideal).

Letter “**H**” followed by a number:

The “H” indicates the hours of motor operation.

The number indicates how many hours the motor has been running. To check how many hours the machine has been operating, switch the device off and then on again.

Flashing dot “.”:

The flashing dot indicates that the board is ready to operate and is awaiting the starting command.

Pendulum Brush Operation

The SL49 board manages the operation of electric brushes for farmed cattle, controlling the start motor contact, the operation time, the direction of rotation and the force applied to the brush itself. It supports monophase 230VAC motors (1HP max) for the **standard version** and 115VAC (0.5HP max) for version “A”. A one-digit display signals some messages, such as the motor’s sense of rotation or any alarms detected.

Main features

- Motor protection with 10A fuse.
- Motor start by means of electronic commutators (Triac).
- Messages signalled on one-digit display.
- Monitored power supply.

Normal operation

When the motor is at a standstill awaiting a work cycle, the dot on the display flashes to indicate that the board is active. By means of the start motor contact, the board controls the start and end of a work cycle. It can be connected to a normally open contact or normally closed using Dip Switch SW1.

In the case of the pendulum brush, this is connected to a 3-wire inclination sensor.

When the device is activated, the SL49 starts a brush rotation procedure that lasts for a set time of 90 seconds. The end of each cycle is followed by a pause of about 4 seconds; when the device is activated again, the motor starts to turn in the opposite direction to that of the previous cycle in order to use the brush evenly. The display shows the letters "R" and "L" to indicate the sense of rotation.

Control of current

The device checks the current absorbed by the motor to establish whether the brush is operating correctly. Every time the current exceeds the threshold set by the Trimmer R22, the brush inverts rotation (motor block/failure condition); if this situation is repeated more than 5 times at intervals of less than 6 seconds, the SL49 enters a condition of alarm identified by message "5" on the display.

The same situation could occur when the board does not detect variations of the current when passing from motor off to motor on (situation of disconnected/burnt out motor or board failure). In this case, however, the system enters the condition of alarm immediately without waiting for the event to be repeated more than 5 times and the display shows message "4". If one of these two alarms occur, the SL49 remains in the condition for about 4 minutes, then returns to normal operation.

Overvoltage and undervoltage control

The SL49 board constantly monitors the voltage supply (230/115V) and switches off the brush if this reaches values that could damage the electronic board or the motor. These conditions of alarm are identified by the messages "1" and "2" on the display; the SL49 remains in one of these two conditions as long as the alarm persists.

Overheating control

The SL49 board constantly monitors the temperature inside the container, switching off the brush if it exceeds 75°C; the display shows message "3" and the SL49 remains in this condition as long as the alarm persists.

Description of LED meaning

Rif.	Colour	Description
DL1	RED	Presence of voltage supply.
DL2	GREEN	On: inclination sensor at rest (brush stopped after time out). Off: inclination sensor active (brush in operation).

Description of display messages

Carattere	Description
dot	Flashing, board active, awaiting work cycle
r	Motor running in direct sense of rotation
L	Motor running in inverted sense of rotation
1	Overvoltage alarm; above 270V for brushes at 230V, 140V for 115V
2	Undervoltage alarm; less than 180V for brushes at 230V, 85V for 115V
3	Overheating alarm; more than 75°C inside the container
4	Disconnected/burnt out motor alarm
5	Motor block alarm

Technical data

Name	SL49	SL49A
Voltage supply	230VAC 50/60HZ	115VAC 50/60HZ
Maximum motor capacity	1HP	0,5HP
Running time	90 sec	90 sec
Peak current threshold (R22)	0A - 12Arms	0A - 12Arms
Operating temperature	-15°C - +55°C	-15°C - +55°C
Motor protection	Fuse 10A	Fuse 12A

FAULT TREE

Below we give a description of some malfunctions that, on the basis of internal statistics, occur most frequently and are caused by wear, exposure to particularly difficult climatic conditions or failures. Therefore, based on the data in our possession, these are the most common cases and relative method for identifying the fault according to the following:

METHOD OF CONSULTATION

1. Brush behaviour:

- Potential fault
 - Possible solutions

Pendulum BRUSH:

1. The brush does not start:

- No voltage supply to brush.
 - Make sure that the voltage supply is arriving.
 - Check that the differential and/or magnetothermal switches are in the correct position.
 - Check the integrity and correct connection of the supply cable and the motor cable.
- Supply voltage too low: the display shows alarm message "2".
 - For brush with 230VAC supply, check that voltage is more than 180VAC.
 - For brush with 115VAC supply, check that voltage is more than 85VAC.
- Tensione di rete troppo alta: il display mostra il messaggio di allarme "1".
 - Per spazzola alimentata a 230VAC verificare che la tensione di rete sia inferiore a 270VAC.
 - Per spazzola alimentata a 115VAC verificare che la tensione di rete sia inferiore a 140VAC.
- Fuse F1 burnt out.
 - Remove voltage from brush and replace the 10A fuse F1, pressing the cap and turning slightly anti-clockwise. Supply voltage to brush and check that the red LED DL1 lights up. If the fuse burns immediately, the board is faulty.
- Red LED DL1 off.
 - Check integrity of fuse and that it is inserted correctly in its housing.
 - Carry out checks as above.
- The inclination sensor does not work for pendulum.
 - Check that the sensor is properly connected to terminals 8N, 9M, 10G as shown in Fig. B.
 - Replace the inclination sensor.
- Faulty board.
 - Replace board.

2. The brush continues to operate:

- Dip-switch SW1 not configured correctly.
 - Configure dip-switch SW1 as shown in Fig. B (1 ON and 2 OFF) for pendulum
- The inclination sensor does not work for pendulum
 - Check that the sensor is mounted and locked correctly on the fastening plate.
 - Check that the sensor is properly connected to terminals 8N, 9M, 10G as shown in Fig. B.
 - Replace the inclination sensor.

3. The brush turns for two seconds then stops for 4 minutes; the display shows alarm message "4"

- Motor cables connected incorrectly.
 - Check that the two motor windings are properly connected, both to the motor and to the board.
- Motor failure.
 - Check the two windings and replace the motor if necessary.
- Faulty board.
 - Replace board.

4. The brush does not invert direction when under force:

- Trimmer R22 not set correctly.
 - Turn trimmer R22 slightly anti-clockwise until the brush inverts direction under required force. If the trimmer limit switch is reached without success, replace the board.
- Faulty board
 - Replace board.

5. The brush inverts direction five consecutive times then stops for 4 minutes; the display shows the alarm message "5":

- Motor mechanically blocked by foreign bodies.
 - Free the brush from any foreign bodies.
- Trimmer R22 not set correctly.
 - Turn trimmer R22 slightly clockwise until obtaining required force on brush, thus exiting the alarm condition. Warning! The position of the trimmer must never exceed a half turn clockwise; otherwise, check motor assembly.
- Faulty board.
 - Replace board.
- Motor with locked mechanical parts.
 - Replace motor.

6. The brush attempts to start five consecutive times but does not turn, then it stops for 4 minutes; the display shows the alarm message "5":

- Motor is mechanically blocked.
 - Free the brush from any foreign bodies.
 - Replace the motor or any blocked mechanical parts.