

USER'S MANUAL

※ Please be sure to read this manual before operation.

※ Model

: Champion / Mighty / M4 / E - III / E II Pro / Combi24 / K-35 / K-35 Cube / N2 / N7 / N1

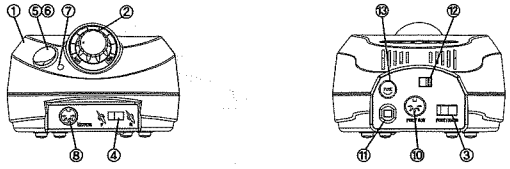
1. Precaution

- Install the unit at the working place and do not use it in a dirty or very hot and humid place. (-20°C ~ 40°C, 0 ~ 90% RH)
- Please be careful not to drop the handpiece. It will damage ball bearing or weaken durability of motor.
- Please do not allow water or other liquids to spill onto and into the handpiece and control box.
- After replacing a bur, please make sure to close the chuck handle. Also, do not to open the chuck handle, while the handpiece is operating.
- While the handpiece is not in operation, it is recommended to keep the bur into the collet chuck after cleaning up.
- Please plug the power cord after checking the unit power is off. This unit is made for dental laboratory work, nail care and other drilling work. It's only used for by specialists who is trained of electric micro-motor.

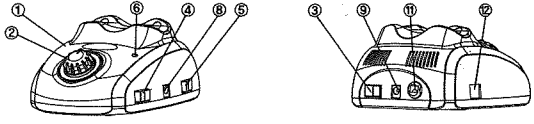
2. Part introduction & Specification

Components

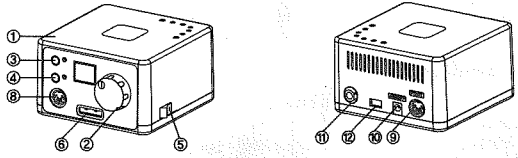
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|------------------------------|-------------------------------|
| ① Control Unit | ⑨ Foot Pedal Connector |
| ② Speed Control Knob | ⑩ On/Off Foot Pedal Connector |
| ③ Hand / Foot Selector | ⑪ Power Cord |
| ④ Forward / Reverse Selector | ⑫ Input Voltage Selector |
| ⑤ Power Switch | ⑬ Fuse Holder |
| ⑥ Pilot Lamp | ⑭ Reset Switch |
| ⑦ Overload Lamp | ⑮ Output Selector |
| ⑧ Motor Connector | |



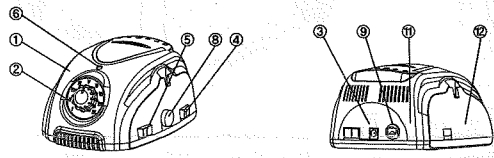
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|---------------|---------------|---------|--------------|-----------|---------------|-----|----|
| Escort-II pro | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,450 | W | D | H |
| | | | | | 140 | 155 | 90 |



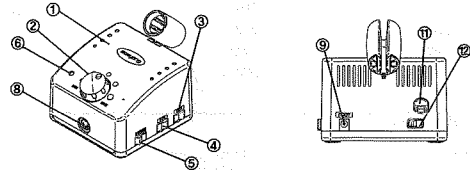
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| Combi 24 | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 24V, 0.5A | 882 | W | D | H |
| | | | | | 117 | 154 | 72 |



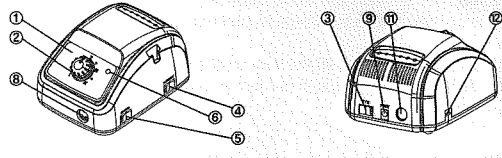
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|------|---------------|---------|--------------|-----------|---------------|-----|----|
| K-35 | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,130 | W | D | H |
| | | | | | 120 | 120 | 75 |



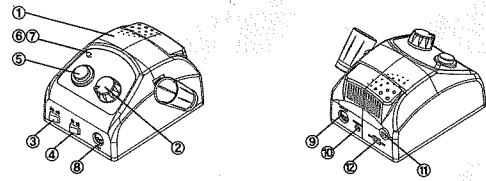
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| Marathon-3 Champion | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,250 | W | D | H |
| | | | | | 118 | 156 | 78 |



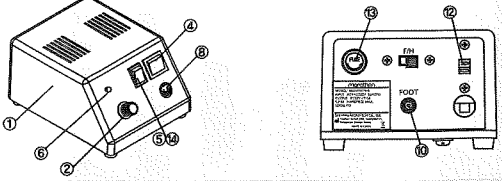
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|-----------|---------------|---------|--------------|-----------|---------------|-----|----|
| K-35 Cube | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,250 | W | D | H |
| | | | | | 120 | 120 | 85 |



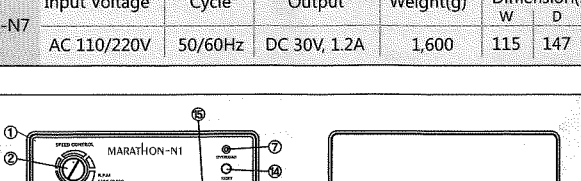
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|----------------------|---------------|---------|--------------|-----------|---------------|-----|----|
| Marathon-3 Mighty | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,260 | W | D | H |
| | | | | | 118 | 156 | 78 |



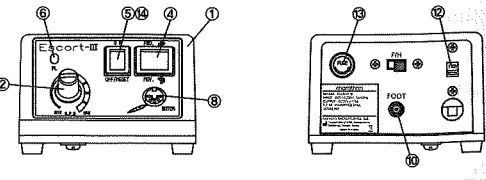
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|-------------|---------------|---------|--------------|-----------|---------------|-----|----|
| Marathon-N2 | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.8A | 1,200 | W | D | H |
| | | | | | 115 | 147 | 96 |



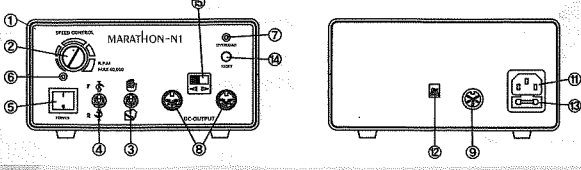
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| Marathon-4 | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,130 | W | D | H |
| | | | | | 120 | 120 | 75 |



| | | | | | | | |
|-------------|---------------|---------|--------------|-----------|---------------|-----|----|
| Marathon-N7 | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 1.2A | 1,600 | W | D | H |
| | | | | | 115 | 147 | 96 |



| | | | | | | | |
|------------|---------------|---------|--------------|-----------|---------------|-----|----|
| Escort-III | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 0.5A | 1,250 | W | D | H |
| | | | | | 112 | 147 | 78 |



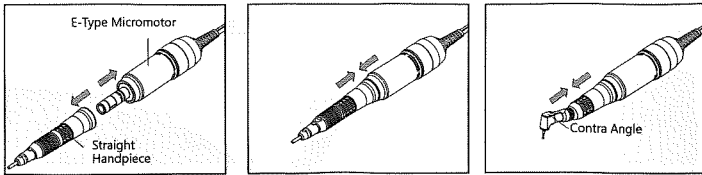
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|-------------|---------------|---------|--------------|-----------|---------------|-----|----|
| Marathon-N1 | Input Voltage | Cycle | Output | Weight(g) | Dimension(mm) | | |
| | AC 110/220V | 50/60Hz | DC 30V, 1.4A | 3,960 | W | D | H |
| | | | | | 180 | 140 | 88 |

3. Installation & Operation

3-1. Installation

- 1) Motor cord plug is required to be well connected into the motor cord connector on the control box.
- 2) Foot pedal switch cord plug is required to be well connected into the foot switch connector on the control box

- Power cord plug is required to be well connected into the power outlet only after making sure that all cords have been connected properly and safely.
- Handpiece connection (In case of E-type micro-motor)



- * Insert a straight or a contra angle handpiece into E-type micro-motor.
- * In case of the first use after purchasing a straight handpiece or a contra angle, please run the handpiece under no load state, then use.

3-2. Operation by Hand

- Connect a handpiece to a control box.
- Turn on the power switch.
- Turning the speed control knob clockwise will increase the speed of handpiece.
- Switching on the Forward/Reverse selector will change the direction of handpiece.

3-3. Operation by Foot

- Connect a foot switch to the control box.
- Turn on the power switch.
- To change as the Foot mode, switch on the Hand/Foot selector.
- In the Foot mode, a handpiece will be operated within the limit of set speed.

4. Bur/Bit insertion and removal

- To remove a bur, please turn the chuck handle clockwise until it clicks to stop and then, pull out the bur/bit.
- To insert a bur, please turn the chuck handle counterclockwise until it clicks to stop.
- Please keep clean the collect chuck and bur before reassembled.
- Please be sure not to use bent, asymmetrical or damaged burs. Always use standard burs.

5. Safety protection system : Overload protection function

- To protect the units from excessive temperature rise caused by overloading such as by failure of ball bearing, greater loading to the bit, etc., A temperature sensor activates by the preset value to be shut off the power supply.
- If a control unit gets overloaded, the control unit will be stopped after 5 seconds. Turn off the unit and after over 30 seconds, restart.

Overload message

- K-35 : Two warning lights (Foot light & Reverse light) blink at the same time.
- N2 : The color of overload lamp changes from green to red.
- N7 : The overload lamp turns on and sounds a beeping alarm.
- How to restart : Turn a speed control knob to MIN to restart the unit after the overload stop.

6. Trouble shooting

| Trouble | Cause | Remedy |
|--|---|---|
| Although a control box is fully charged, a handpiece fails to run. | Loose connection of a motor cord with the motor connector of control box. | Correctly plug the motor cord to the motor connector of control box. |
| | Defect in the motor cord. | Replace the motor cord. |
| | Worn carbon brushes. | Replace the carbon brushes. |
| | Trouble in the motor part. | Check the motor and repair if the motor has a problem. |
| Motor stops suddenly in use. | Overloaded or a chuck is open in operation. | See No.5 Safety protection system. Check the chuck and close the chuck. |
| Motor fails to run during a foot mode. | Foot switch fails to function. | Set it on "F". Check and replace the foot switch. |

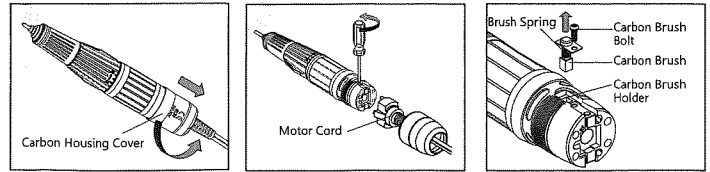
* In case any malfunction is found, consult with an official dealer.

7. Maintenance

7-1. Replacing carbon brushes

- After turning off the power, remove a carbon housing cover of motor cord from the motor.
- Take off carbon brush bolts, by a screwdriver(+) and then remove worn-out carbon brushes.
- Replace new carbon brushes carefully, a brush spring should get jammed in a carbon brush holder.
- Assemble the handpiece.
- After running the handpiece under no load state around 20,000 rpm for 30 minutes, and then use.

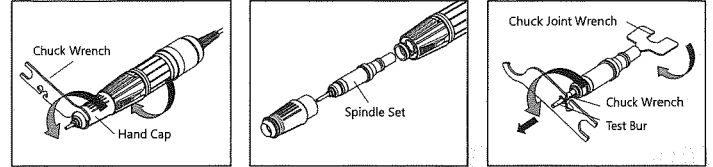
* Replacement cycle of carbon brushes will depend on working hours and loading conditions.



7-2. Replacing collet chuck

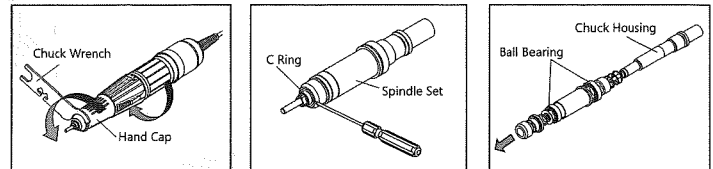
- A handcap and a spindle assembly will be disassembled by turning the handcap counterclockwise with a chuck wrench.
- The collet chuck is disassembled by turning it counterclockwise with a chuck joint wrench and the chuck wrench.
- Replace the old collet chuck with a new one and then assemble a handpiece.
- Run the handpiece under no load state and confirm proper replacement, then use.

* Replacement cycle of collet chuck will depend on working hours and loading conditions.



7-3. Replacing ball bearing

- Disassemble a handcap and a spindle assembly from the front part of a handpiece.
- If a C-ring is picked out of the front chuck housing, ball bearings and other supporting parts will be disassembled.
- Assemble other supporting parts and replace to new ball bearings sequentially, install the C-ring again.
- Assemble the hand cap and the spindle assembly.
- Run the handpiece under no load state and confirm proper replacement, and then use.

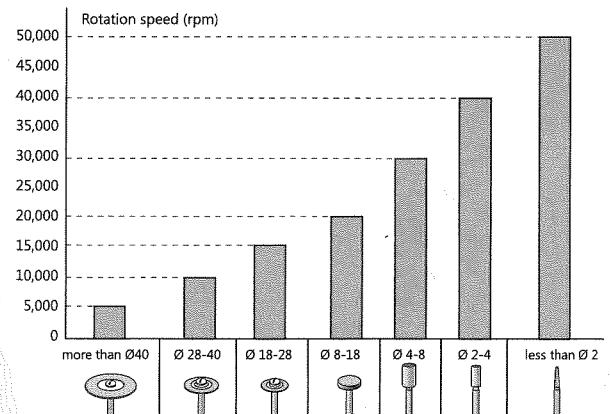


8. Allowable rotation speed

* This chart is a general guide for a maximum speed with conventional burs. The allowable rotation speed can be slightly different, depending on bur materials or types.

* Notice

- Make sure not to extend the maximum speed specified by a manufacturer or distributor.
- Large burs, even being operated below maximum speed, will vibrate. Speed should be reduced immediately to prevent damage to a bur, a handpiece or operator.
- Be sure to insert the bur shank all the way, until it touches the back of the collet chuck. Then tighten collect chuck. If the bur is used not inserted completely, it is very dangerous.



9. Warranty

* We do not guarantee its quality in case of users' carelessness.

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SAEYANG MICROTECH Co., Ltd.

(Galsan-dong), 348, Seongseo-ro, Dalseo-gu, Daegu, 42697, Korea
 TEL +82-53-582-9000 FAX +82-53-581-9003