ELECTRIC DENTAL MOTOR

EMC-900

Installation, Operation & User Manual

Brushless electric motor with control unit · Installation, operation, care and EMC information



DOCUMENT

EMC-900 Operating Manual
November 2026 · EMC900-MAN-002

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How to read this manual

⚠ **WARNING** Risk of injury or damage to the equipment. Follow exactly.

ⓘ **NOTE** Information that makes the job easier or the result more reliable.

Technical support

(800) 560-8222

Monday to Friday, 8:00 AM to 5:00 PM Pacific.

SECTION 01

Classification

Read the safety precautions in this section and understand how to use the motor correctly before you use it.

Protection against electric shock	Class II equipment
Degree of protection	Type B applied part
Flammable anesthetics	Not suitable for use with flammable anesthetic gas mixed with air, oxygen or nitrous oxide
Mode of operation	Intermittent operation

How precautions are marked

SIGNAL WORD	MEANING
Warning	A hazard that can cause personal injury or damage to property.
Caution	A hazard that can cause minor or serious injury and damage to property.
Notice	A precaution to observe for safe use.

SAFETY

Warnings and cautions

⚠ WARNING

- Do not touch the power cord with wet hands.
- Keep water and other liquids off the control unit; a short circuit can cause electric shock.
- Plug and unplug the power cord gently.
- If you see smoke or smell burning resin, turn off the power switch, unplug the unit and have it repaired.
- Do not use the motor where there is a risk of explosion or near flammable materials.
- Use a grounded power outlet.
- Stop at once if you notice unusual vibration, heat or noise before or during use.
- Replace the adapter fuse only with the specified rated fuse.

Caution

- Patient safety comes first. Use this product with care.
- For dental treatment by qualified dentists only. Do not use for oral surgery or implant treatment.
- Connect every part correctly; a poor connection can cause LED failure or water or air leaks.
- Do not drop the product or subject it to strong impact.
- Connect handpiece tubing to ISO 9168 Type B (Midwest 4-hole) or Type C (ISO 4-hole with light).
- Operating conditions: 0–40 °C (32–104 °F), 10–85% humidity, 70–106 kPa, with no water droplets on the control unit.
- Do not bend or twist the water line or wiring when installing the control unit or motor, and do not force any part.
- Do not use air contaminated with dust or moisture; it can cause malfunction or overheating.
- Do not connect the EM1 motor to other manufacturers' products.

SAFETY

Cautions and notices

Control unit

- Unplug the power cord and motor cord by the plug, never the wire.
- Keep the wiring away from gas burners. Replace a damaged motor cord; do not repair it.
- Check for looseness, vibration, abnormal sound or heat by running the motor outside the patient's mouth. Stop using it at the slightest problem and contact your dealer.
- Do not spill water on the unit: it can cause fire or electric shock.

Motor and handpiece

- Do not run the motor under high load for long periods; it can overheat.
- Connect or disconnect the handpiece only when the motor has stopped.
- Set the speed within the handpiece's allowed range before use.
- Only 4-hole, 5-hole or 6-pin couplings can be connected.
- Supply dry air free of water and oil: use a compressor with an air dryer and add an air filter if needed. Blow out the air line before installation.
- Do not autoclave or heat-sterilize the control unit, adapter or motor cable.

NOTICE

- Computers and network cables close to the running motor or its cord can be affected, and radios nearby may pick up noise.
- Turn off the power after use. If the unit will not be used for a long time, unplug it and drain the water from the control unit, handpiece tubing and motor cord.
- The user is responsible for operating, maintaining and inspecting the equipment.
- Store and transport at −10 to 60 °C, 10–85% humidity and 70–106 kPa, away from dust, sulfur and salt.

SAFETY

Important notes

Read these notes carefully before use.

1. Use the device only as described in this manual. TPC is not responsible for accidents caused by not following it.
2. Before connecting power, make sure the supply voltage is within the power adapter's range. The wrong voltage damages the device and can harm the operator and patient.
3. Use original accessories, such as the motor. TPC is not liable for problems caused by accessories it did not supply.
4. Do not insert any object into the device: risk of electric shock.
5. When installing the control unit, do not wind the connecting tube or power cord.
6. Keep cleaning agents and other liquids out of the control unit and adapter.
7. Cut the power at once if anything is abnormal. Do not modify the circuits or components; disassembly or modification can cause the drive to malfunction.
8. Turn off the power after each use. Before long-term storage, drain the device and hose.
9. Keep the device away from strong electromagnetic interference, high-current equipment and patients with pacemakers.
10. Unstable voltage or magnetic fields can affect normal operation.
11. For use by dental professionals only.

SECTION 02

Contents, intended use and specifications

In the box

- Control unit with motor and tubing
- Power adapter, 32.0 V DC, 2.81 A
- Power cord
- Operating manual

Intended use

The EMC-900 drives ISO E-type straight and contra-angle handpieces at constant, increased or reduced speed for general dental procedures such as cavity preparation, crown preparation and finishing, filling and polishing. For use by trained dental professionals only.

Service life: 5 years.

Power adapter (supplied)

Output	32.0 V DC, 2.81 A
Input	100–240 V AC, 50–60 Hz
Output plug	DC, 5.5 × 2.1 mm

Use only the adapter supplied with the EMC-900.

Motor

Model	EM1
Supply	32 V DC
Rotation	Forward and reverse
Speed range	2,000–40,000 rpm
Maximum torque	3.5 N·cm
Cooling air	6–8 NL/min at 0.2 MPa
Size	Ø21.7 × 70.5 mm

Control unit

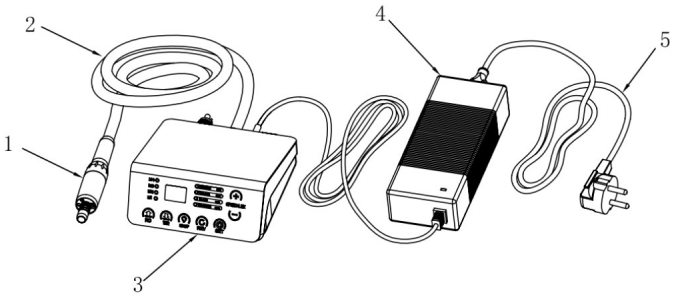
Model	EC1
Supply	32 V DC
Air pressure	0.2–0.6 MPa
Size	135 × 135 × 67 mm

Air and water

Spray water	65–85 mL/min at 0.2 MPa
Spray air	1.5–2.0 L/min at 0.2 MPa
Water pressure	0.2–0.6 MPa; 0.2 MPa recommended

PRODUCT

Components and controls



NO.	CODE	NAME	QTY
1	203200	Motor	1
2	203201	Tubing assembly	1
3	203202	Control unit	1
4	203204	Power adapter	1
5	203205	Power cord	1
—	315026	Tubing handle	1

Rear panel



ON/OFF Power switch

POWER Adapter socket, DC 32 V

OUT Motor cord

IN Handpiece tubing connector (max. 0.6 MPa air and water)

Front panel



M1–M4 Memory indicators

88 Speed display

Ratio Gear ratio indicators: 20:1, 16:1, 1:1, 1:5

+ / – SPEED/LUX: speed or light adjustment

RD · WR Recall and store a memory

ON/OFF Motor light

REV · SET Reverse direction · select gear ratio

SECTION 03

Connect the tubing and power

⚠ **CAUTION** Check that the handpiece tubing does not leak air or water at the control unit. Tighten the screws on the motor cord and tubing connectors so the motor runs correctly.

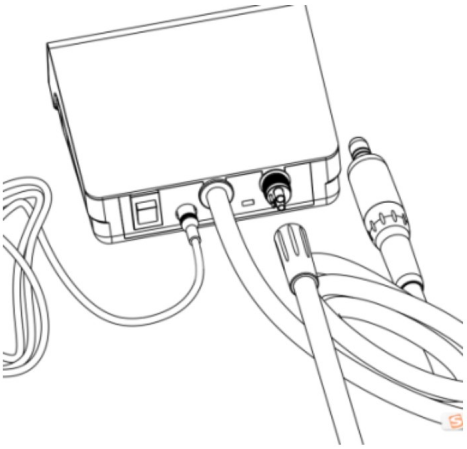


Fig. 1 Handpiece tubing connector

Handpiece tubing

1. **Push the handpiece tubing plug** from the dental chair firmly into the connector, then tighten the nut, lining it up with the shape of the tubing end.

- Use only the hose recommended by TPC.
- Check the compressor drain before use.
- Do not pull hard on the motor cord.
- Do not use contaminated or humid air.

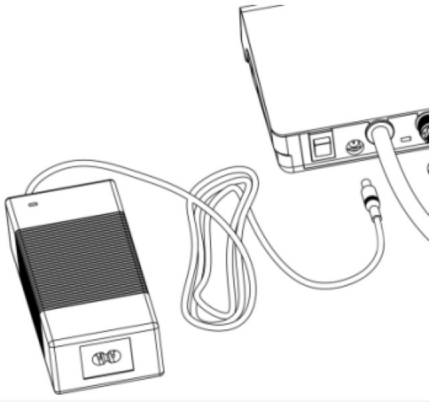


Fig. 3 Adapter socket and power plug

Power

2. **Line up the adapter plug** with the POWER socket on the control unit and push it in firmly.

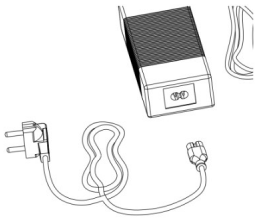


Fig. 2 Power adapter and cord

INSTALLATION

Motor cord and handpiece

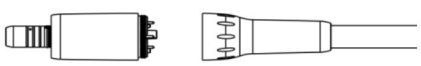


Fig. 4 Motor, motor cord connector and nut

Motor and motor cord

3 **Push the motor straight into the motor cord connector** until it stops, then tighten the motor cord nut firmly. To remove it, loosen the nut and pull the motor straight out.



Fig. 5 Handpiece, locating pin and motor insertion end

Handpiece

4 **Push the handpiece onto the motor** and turn it until it clicks onto the locating pin. To remove it, hold the motor and handpiece firmly and pull them straight apart.

Handpieces are sold separately.

⚠ **CAUTION**

- Lubricate E-type handpieces as their manufacturer directs, stand them upright to drain excess oil, and wipe them clean before connecting them to the motor.
- Do not attach or remove the handpiece while the motor is turning.
- Do not store an oiled handpiece on the motor: oil can run into the motor and cause failure. Store it separately and attach it when needed.
- Keep water out of the motor.

SECTION 04

Power, gear ratio and speed

1. **Connect the adapter** and turn on the power switch: the display lights. Before switching on, make sure the adapter output is 32 V DC.
2. **Press SET** to choose the gear ratio of the handpiece you are using. The indicator for the selected ratio lights.
3. **Press + or –** (SPEED/LUX) to set the speed. The display shows two digits; the table shows what they mean for each ratio. The buzzer beeps twice at the lowest or highest speed.



GEAR RATIO	DISPLAY	HANDPIECE SPEED	EACH STEP
20:1 (reduction)	1–20	100–2,000 rpm	100 rpm
16:1 (reduction)	1–25	100–2,500 rpm	100 rpm
1:1 (direct)	2–40	2,000–40,000 rpm	1,000 rpm
1:5 (increase)	1–20	10,000–200,000 rpm	10,000 rpm

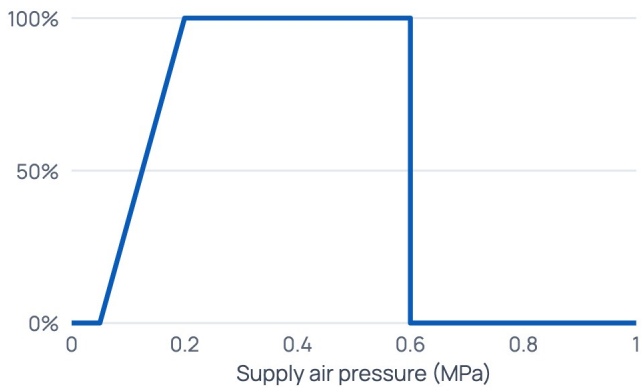
OPERATION

Direction, memory, light and air pressure

REV · Direction	Press to switch the motor between forward and reverse.
WR · Store	Press WR: the memory indicator flashes. Press WR again to choose M1, M2, M3 or M4. After 2 seconds the current settings are saved automatically.
RD · Recall	Press RD to choose a memory. Its indicator lights and the motor runs with the settings stored there.
ON/OFF · Motor light	Press to turn the motor LED on or off. To change brightness, hold the light button and press + or −: there are 5 levels. The buzzer beeps twice at the lowest or highest level.

⚠ **AIR PRESSURE**

- **BELOW 0.05 MPA** the motor does not run.
- **0.05–0.2 MPA:** to prevent overheating the motor runs below the set speed, in proportion to the air pressure.
- **0.2–0.6 MPA:** the motor runs at the set speed.
- **ABOVE 0.6 MPA** the motor stops to protect itself (fault code E2).



Motor speed as a share of the set speed

SECTION 05

Cleaning and care

⚠ CAUTION

- Do not autoclave or heat-sterilize the control unit, adapter or motor cord.
- Do not lubricate the motor.
- Do not clean, soak or wipe the equipment with electrolyzed (strongly acidic) water or sterilizing solutions: resin parts can discolor and metal parts corrode.
- Do not use hydrogen peroxide or disinfectant to clean the unit.
- To avoid losing the motor protection cap, hang it on a hook when not in use; do not store it on the motor, where it can fall off.

Daily cleaning

Keep the motor and control unit clean. Wipe their surfaces with alcohol.

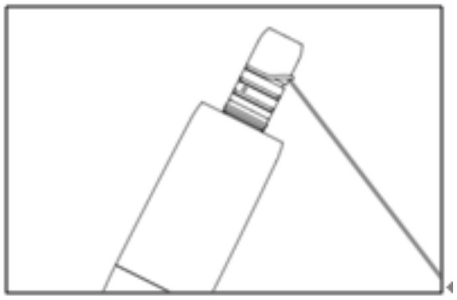


Fig. 6 Replacing the O-ring at the motor insertion end

Replace the O-rings

Worn O-rings make the handpiece hard to fit and can cause water or air leaks. There are three O-rings. Replace them if you notice:

- Water leaking, or no water flow
- Air leaking or poor air flow
- Vibration
- Difficulty fitting the handpiece

1. Remove the worn O-ring from the motor insertion end with a tool such as a needle.
2. Fit the new O-ring into the groove.

O-ring (black, motor protection): part no. 315020

CARE AND SERVICE

Fault codes and service

CODE	FAULT	WHAT TO DO
E1	Over- or under-voltage	1. Turn the power switch off and on again. 2. Check that the adapter supplies 24–36 V DC. 3. Check the adapter output for faults.
E2	Over-pressure	Adjust the supply air pressure to 0.2–0.6 MPa.
E3	Motor phase missing	Check the motor connection, then switch on again.
E4	Motor stalled	Free the handpiece from the object and restart.

If a problem remains after these checks, contact TPC or your dealer before sending the unit for repair.

Warranty

TPC warrants the product for 1 year from the date of purchase, provided it is used as described in this manual. The warranty does not cover damage from not following this manual, or disposable parts.

Register online: go to **tpcdental.com**, open the Forms tab and choose Register Equipment Serial Number. Keep your proof of purchase.

Disposal

Contact TPC or your dealer for advice on disposing of the product. Do not dispose of it as unsorted municipal waste.

Storage and transport

Handle with care and avoid vibration and shock. Store in a dry, cool place away from toxic, corrosive, volatile, flammable or explosive materials.

SECTION 06

Symbols

These symbols appear on the product, its label and its packaging.

CE mark (0123) · Conforms to the essential requirements of the Medical Device Directive 93/42/EEC.

TÜV SÜD · Professional management system certification.



Date of manufacture



Manufacturer



Authorized representative in the European Community



Serial number



Caution · See the accompanying documents.



Type B applied part



Class II equipment



Separate collection · Do not dispose of as unsorted municipal waste.



Refer to the operating manual



Fragile · Handle with care.



Keep dry



This way up



Non-ionizing radiation · The device includes an RF transmitter or uses RF electromagnetic energy.

REFERENCE

Electromagnetic compatibility

The EMC-900 is intended for use in the electromagnetic environment below. The customer or user should make sure it is used in such an environment.

Emissions

TEST	COMPLIANCE	ENVIRONMENT AND GUIDANCE
RF emissions, CISPR 11	Group 1	Uses RF energy only for internal functions. RF emissions are very low and unlikely to interfere with nearby electronic equipment.
RF emissions, CISPR 11	Class B	Suitable for all establishments, including domestic buildings and those connected directly to the public low-voltage supply.
Harmonic emissions, IEC 61000-3-2	Class A	
Voltage fluctuations / flicker, IEC 61000-3-3	Complies	

Immunity

TEST	IEC 60601 TEST LEVEL	COMPLIANCE LEVEL	ENVIRONMENT AND GUIDANCE
Electrostatic discharge, IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. With synthetic flooring, relative humidity should be at least 30%.
Electrical fast transient / burst, IEC 61000-4-4	±2 kV power lines ±1 kV input/output	±2 kV power lines ±1 kV input/output	Mains power should be typical commercial or hospital supply.
Surge, IEC 61000-4-5	±1 kV line to line ±2 kV line to ground	±1 kV line to line ±2 kV line to ground	Mains power should be typical commercial or hospital supply.
Voltage dips and interruptions, IEC 61000-4-11	<5% Ut for 0.5 cycle 40% Ut for 5 cycles 70% Ut for 25 cycles <5% Ut for 5 s	Same as test level	Mains power should be typical commercial or hospital supply. If operation must continue during interruptions, power the unit from a UPS or battery.
Power frequency magnetic field (50/60 Hz), IEC 61000-4-8			Magnetic fields should be at levels typical of a commercial or hospital environment.

Ut is the AC mains voltage before the test level is applied.

REFERENCE

Electromagnetic compatibility, continued

RF immunity

- At 80 MHz and 800 MHz the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.
- Field strengths from fixed transmitters such as phone base stations, land mobile radio, amateur radio and AM, FM and TV broadcast cannot be predicted accurately. If the measured field strength where the EMC-900 is used exceeds the compliance level, check that it works normally; if not, reorient or relocate it.
- Over 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances

Keep portable and mobile RF communications equipment at least the distance below from the EMC-900, based on the transmitter's maximum rated output power.

RATED OUTPUT (W)	150 KHZ – 80 MHZ	80 – 800 MHZ	800 MHZ – 2.5 GHZ
0.01	0.12 m	0.12 m	0.23 m
0.1	0.38 m	0.38 m	0.73 m
1	1.2 m	1.2 m	2.3 m
10	3.8 m	3.8 m	7.3 m
100	12 m	12 m	23 m

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