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NSK

All Titanium Body Micromotor System

Ti-Max EL400

40,000min^{-1}(rpm)

OPERATION MANUAL

OM-E0078E Rev.3

Please read this operation manual carefully before use and keep for future reference.

Classification of equipment

- Type of protection against electric shock:
  - Class II equipment:
- Degree of protection against electric shock:
  - Type BF applied part:
- Method of sterilization or disinfection recommended by the manufacture:
  - See 6. Sterilization and disinfection:

Safety Precautions and warning indicators

- Read this manual thoroughly before use and operate the device properly.
- These instructions will show you how to operate the product safely and prevent danger to your or others. They are classified by the degree and/or severity of danger. All contents relating to safety should be oberserved.

Classification of precaution	Degree and severity of danger or damage.
⚠ WARNING	**Explains an instruction where personal injury or physical damage may occur.**
⚠ CAUTION	**Explains an instruction where minor to medium injury or physical damage may occur.**
⚠ NOTICE	**Explains an instruction that should be observed for safety reasons.**

⚠ WARNING

- Do not insert or remove power cord with wet hands, electric shock may occur.
- Be sure not to expose the unit to water. It may result in a short or electric shock.
- Do not use this device near combustibles, or in a place where explosion may occur.
- Do not disassemble, no user serviceable parts inside control unit.
- Do not hit/drop the unit or handpiece. Place unit in a stable place.

⚠ CAUTION

- Place the most priority on patient safety.
- EL400 system is to be used by qualified personnel for dental treatment only, and it is used in dental office only.

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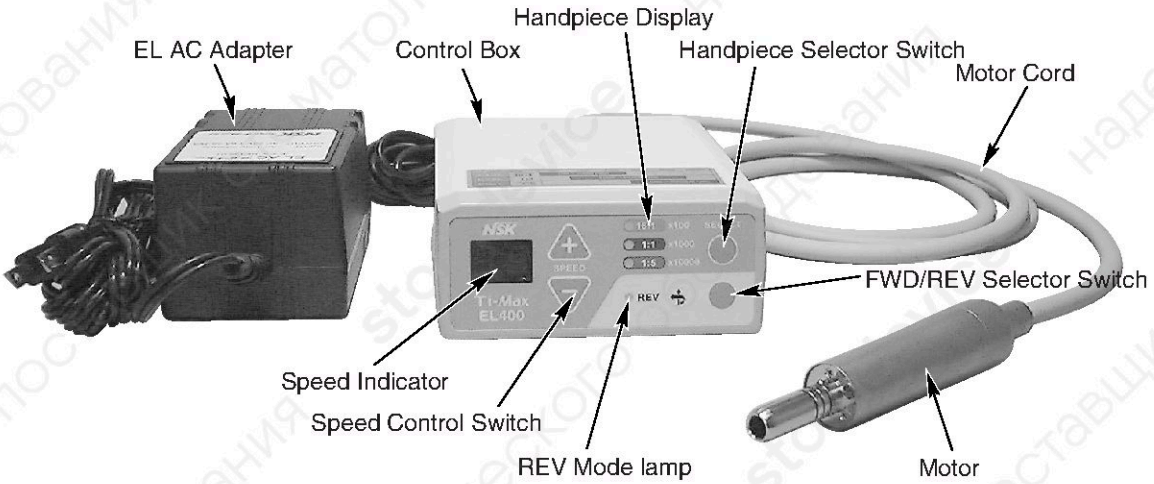
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- Rotate before hand to check for vibration, noise, or overheating. If any abnormalities occur, stop using immediately and contact your dealer.
- Grasp cord by plug to remove from outlet. DO NOT pull or yank on the cord itself.
- Do not connect / disconnect the handpiece during operation.
- Verify that the speed control switch is adjusted within the allowable speed before use.
- When you install control unit or Motor, DO NOT bend or twist the tubing or the cord. No unnatural force is needed to do the installation.
- EL400 system can be used with the hose connector that is manufactured in accordance with ISO 9168, type B or type C.
- Do not autoclave (or any other high temperature sterilization) the motor.
- If you are using corrosive or harsh solutions please clean the control unit etc. immediately after use. Failure to quickly clean the control unit etc. can result in damage to the equipment or color changes of the case.

⚠ NOTICE

- The EL400 is designed to run at 0.245MPa (2.5kgf/cm^2 or 35psi). Increasing air pressure will not increase maximum motor speed and may damage control unit.
- Turn off the Power Switch after each use. If unit is to be stored for long periods of time, drain water from unit and hose.
- Responsibility for operating and maintaining medical devices belongs to the user.

1. SET-UP DIAGRAM



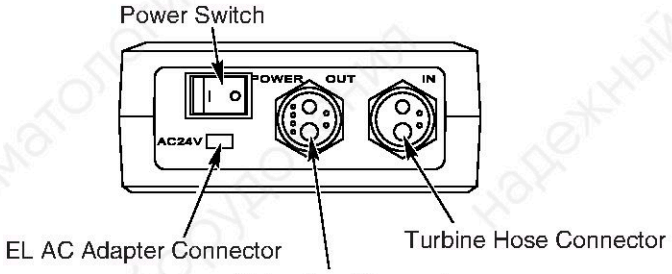


Fig.1

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2. OPERATING CONTROL BOX

⚠ CAUTION

- **Please be sure that there is no air or water coming from tubine hose when attaching to control unit.**
- **Screw the nut properly without unnatural force, when you plug into turbine hose connector and motor cord connector.**

① Connect the handpiece tubing from the delivery unit you are using. Fit the turbine hose plug of the delivery unit to the turbine hose connector piping and tighten completely. (Fig. 2)

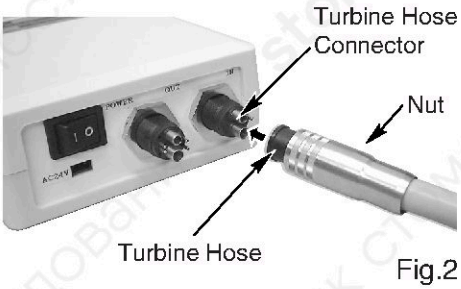


Fig.2

⚠ CAUTION

EL400 system can be used with the hose connector that is manufactured in accordance with ISO 9168, type B or type C.

② Connect the motor by aligning the motor cord plug and motor connector piping, and insert firmly. Tighten completely. (Fig.3)

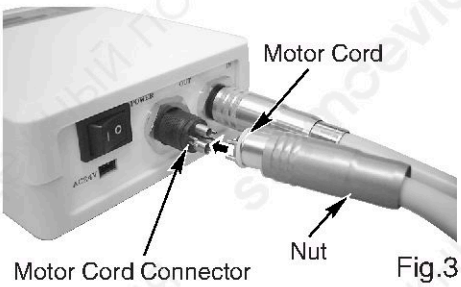


Fig.3

⚠ CAUTION

Set air pressure of the turbine hose connected to the control box more than 0.245MPa (2.5kgf/cm² or 35psi) at the unit, more than 0.216MPa (2.2kgf/ cm² or 31psi) at the hose. If air pressure is low, the speed could not arise.

③ Connecting the EL AC adapter
Insert the EL AC adapter plug into the EL AC adapter connector before plugging into wall outlet. (Fig. 4)

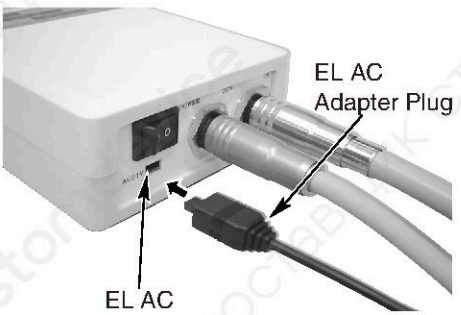


Fig.4

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3. HANDLING THE MOTOR

⚠CAUTION

- **Ensure that the motor has completely stopped before handling the motor.**
- **Care should be exercised not to bend or damage the water or chip air fitting.**

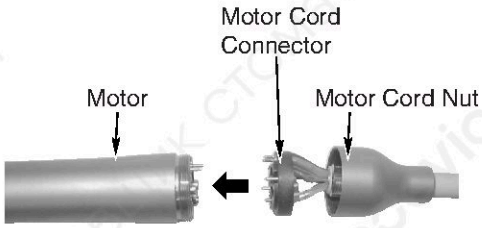


Fig.5

(1) Connecting/disconnecting the motor and the motor cord. Remove the motor cord nut (at the back of the motor) and pull out the motor cord connector. To connect, fit the connector pin holes of the motor cord into the motor. Be sure to align properly before inserting. (Fig.5)

(2) Connecting/disconnecting the motor and the contra angle. To disconnect, hold the top of the motor and the bottom of the contra angle. Pull straight off.
To connect, align the positioning pin of the motor and the holes of the handpiece and insert. You may need to twist the angle slightly until it locks firmly in plase. (Fig. 6)

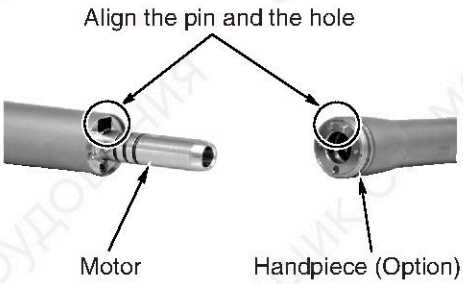


Fig.6

4. OPERATION SECTION

① Insert the AC adapter cord plug into wall outlet and turn the power switch on. When you turn on the power switch, lamps and speed indicator will light.

② Push the handpiece selector to indicate the speed of the attachment you will use. (Fig. 7)

Gear ratio	Indicator	Speed (min^{-1}(rpm))
16:1	1～25	100～2,500
1:1	1～40	1,000～40,000
1:5	1～20	10,000～200,000

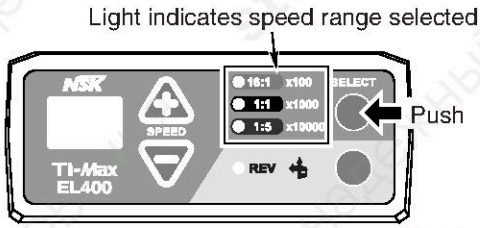


Fig.7

③ Set the maximum speed using the speed control switches. (Fig. 8)

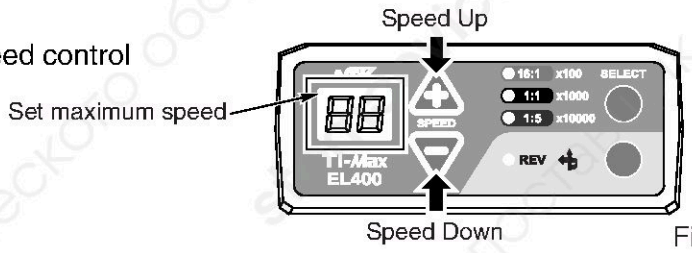


Fig.8

④ Select FWD/REV rotation using the FWD/REV Select switch. (Fig. 9)

⑤ The micromotor operation will be controlled by the air switch/foot pedal of the delivery unit.

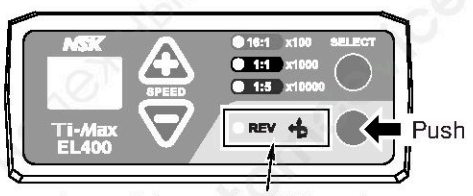


Fig.9

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5. PROTECTIVE CIRCUIT

When the motor is overloaded, the protective circuit functions to stop the motor.

• To reset the protective circuit.

At foot pedal operation, release foot pedal of the delivery unit.

6. CARE

After each use, clean the surface of the motor with brush etc. (Do not use the metal brush), and wipe it with the cotton moistened with disinfecting alcohol.

⚠ CAUTION

- **Do not autoclave (or any other high temperature sterilization) the motor.**
- **Do not lubricate the motor.**
- **Do not wipe with, or clean or immerse in, high acid water or sterilizing solutions.**

7. MAINTENANCE

(1) How to replace the O-rings at the insert.
① Remove the worn O-rings.
② Insert new O-rings the O-ring grooves.

✻ Optional O-rings : Order No.0312-074080

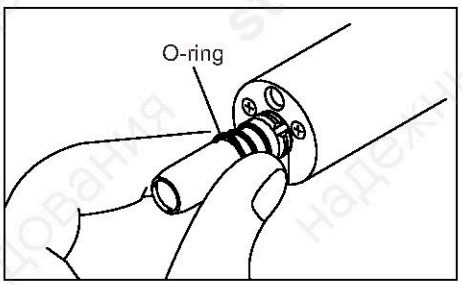


Fig.10

(2) Replacing Carbon Brushes
① To disconnect the motor cord from the motor, unscrew and detach the motor cord nut, and gently pull out the motor cord connector. (See. 3.HANDLING THE MOTOR)
② After removing the screw, remove the Carbon brush.
③ To install new brushes, insert screw in the hole of each carbon brush, and fasten into holes on the motor.
④ To connect, align and insert carefully and firmly the pins of the connector into the pin holes of the motor, and fasten the motor cord nut securely. (See. 3.HANDLING THE MOTOR)

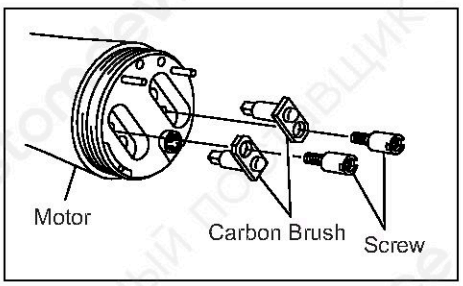


Fig.11

⚠ CAUTION

- **Do not pull the brush from the carbon brush.**
- **Care should be exercised not to bend or damage the water or chip air fitting.**

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(3) Replacing Bulb

①To disconnect the motor cord from the motor, unscrew and detach the motor cord nut, and gently pull out the motor cord connector. (See. 3.HANDLING THE MOTOR)

②Simply pull out the motor housing from the motor. Use a small screw driver and push bulb out.

③Align the bulb pins of a new bulb with the holes, and push the bulb into.

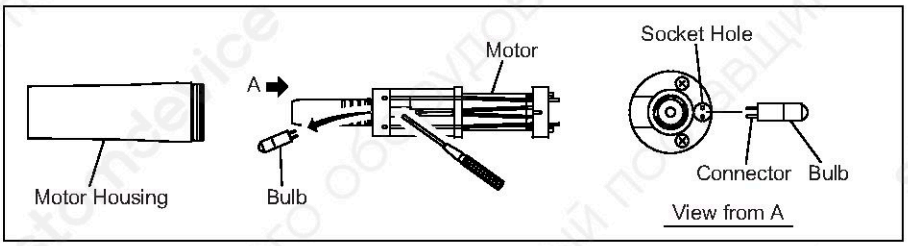


Fig.12

④Insert the motor housing into the motor. Align the locating pin on the motor with the slot in the motor housing, and gently push it in. It is a snug fit.(Fig.13)

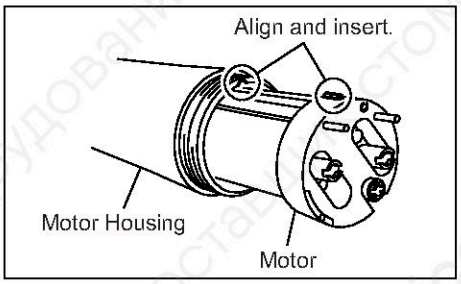


Fig.13

⑤To connect, align and insert carefully and firmly the pins of the connector into the pin holes of the motor, and fasten the motor cord nut securely. (See. 3.HANDLING THE MOTOR)

✻ Optional Bulb : TM Bulb (Pack of 3) Order No.Y900-078

⚠ CAUTION

- **Do not touch the glass section of new bulb.**
- **Care should be exercised not to bend or damage the water or chip air fitting.**

8. SPECIFICATIONS

Motor:

Input	DC22V
Speed	1,000~40,000min^{-1}(rpm)
Dimensions (mm)	ϕ22.8 L=69
Weight	106g

Control Box:

Model	NE136
Power source	AC24V 50/60Hz
Output	DC22V
Dimensions (mm)	W110xD140xH46
Weight	400g

EL AC Adapter:

Model	NE138
Power source	AC120/230V 50/60Hz
Output	AC24V
Dimensions (mm)	W70xD102xH56.5
Weight	955g

※ Specifications may be changed without notice.

NSK
NAKANISHI INC.
700 Shimohinata, Kanuma, Tochigi
322-8666, Japan
www.nsk-inc.com

NSK EUROPE GmbH
Westerbachstraße 58 60489 Frankfurt,
Germany
www.nsk-europe.de

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