

NSK

Air Motor

Ti-Max X205L

X205L

OPERATION
MANUAL

CE 0197 MADE IN JAPAN

OM-M0127E



1. User and Intended Use

User: Qualified Professionals

Intended Use: Dental Treatment

2. Precautions for handling and operation

- Please read these precautions carefully and use only as intended or instructed.
- Safety instructions are intended to avoid potential hazards that could result in personal injury or damage to the device. Safety instructions are classified as follows in accordance with the seriousness of the risk.

Class	Degree of Risk
 WARNING	Hazard that could result in serious injury or damage to the device if the safety instructions are not correctly followed.
 CAUTION	Hazard that could result in light or moderate injury or damage to the device if the safety instructions are not followed.
NOTICE	General product specification information highlighted to avoid product malfunction and performance reduction.

CAUTION

- Read this Operation Manual before use to fully understand the product functions and file for future reference.
- When operating the product always consider the safety of the patient.
- This product does not consider patient's age, gender nor physical condition.
- This product does not consider operator's age, gender nor physical condition.
- Users are responsible for the operational control, maintenance and continual inspection of this product.
- Do not attempt to disassemble the product nor tamper with the mechanism except as recommend by NSK in this Operation Manual.
- Do not allow any impact on to the product. Do not drop the product.
- Operators and all others in the area must wear eye protection and a mask when operating this motor.
- Should the product function abnormally, cease operation immediately and contact your Authorized NSK Dealer.
- Do not use high acid water or sterilizing solutions to wipe, immerse or clean the handpiece.
- The products are delivered in a non-sterile condition and must be autoclaved prior to use.
- Perform regular function and maintenance checks.
- If the product is not used for a long period check it is functioning correctly before using on a patient.
- To avoid clinical downtime it is recommended that a spare be kept on hand in case of a breakdown during surgery.
- Avoid continual eye contact with the LED light.

- This product is classified as a Class 1 LED Product.
- Use a power source which meets the following requirements.
 1. The electricity supply of the power source is below 15W both under normal and single-failure conditions.
 2. The power source uses a SELV circuit for electricity supply.
 3. The output voltage of the power source is within the range recommended by the manufacturer of this product.
- U.S. Federal law restricts this device to sale by or on the order of a licensed physician.

3. Setting of Air & Water Supply Pressure

Measure the supply pressure at the handpiece / hose connection point and set the pressure to the value specified on the specification table. (Fig. 1)

For Multi Gauge information refer to Option Parts List.

WARNING

Do not exceed the optimum pressure specified on the specification table.

CAUTION

Do not use air contaminated by dust, moisture and oil.

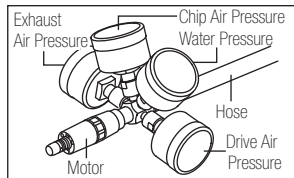


Fig. 1

4. Connection & Disconnection of the Handpiece

4-1 Connection

- 1) Connect the handpiece direct to the motor.(Fig. 2) When connecting an optic handpiece, twist the handpiece until it locks into position with a clicking sound.
- 2) Make sure the handpiece is firmly connected to the motor.

4-2 Disconnection

Hold the motor and the handpiece separately and disconnect with care.

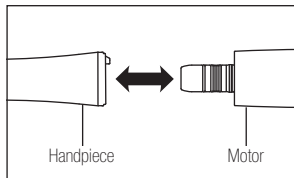


Fig. 2



CAUTION

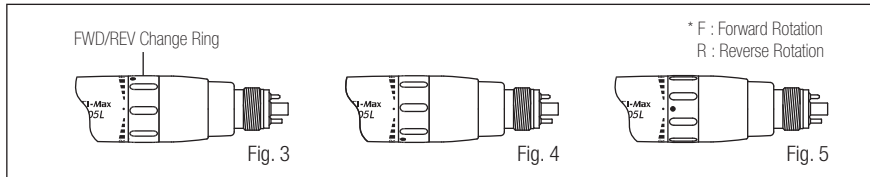
Disconnect the handpiece only after the motor has completely stopped rotating.

5. Check before treatment

Connect the handpiece to the motor and check for motor vibration, noise and overheating. If any abnormalities are found do not use the motor and contact your Authorized NSK Dealer.

6. Forward / Reverse Rotation

- 1) Forward Rotation : Turn the FWD/REV Change Ring to "F".(Fig. 3)
- 2) Reverse Rotation : Turn the FWD/REV Change Ring to "R".(Fig. 4)
- 3) When the FWD/REV Change Ring is positioned at the middle of "F" and "R" , the drive air is interrupted and the motor does not rotate.(Fig. 5)



7. Maintenance

After each patient maintain the product as follows.

7-1 Cleaning

- 1) Remove dirt and debris from the product. Do not use a wire brush.
- 2) Wipe clean with alcohol-immersed cotton swab or cloth.



CAUTION

To clean the product never use any solvent such as benzine or thinner.

7-2 Lubrication

■ NSK PANA SPRAY Plus

Apply NSK PANA SPRAY Plus every time after each use and/or before autoclaving.

- 1) Remove the motor from the hose.
- 2) Mount the arrow-head spray nozzle tip into the spray can port. (Fig. 6)
- 3) Insert the Spray Nozzle into the Drive Air Port of the motor. Hold the motor and spray for approximately 2-3 seconds. Apply lubricant until it expels from the exhaust air part for at least 2 seconds. (Fig. 7)

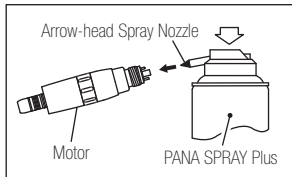


Fig. 6

CAUTION

- When applying spray be sure to hold the motor firmly to prevent the motor from slipping out of the hand due to the spray pressure.
- Hold the spray can upright.

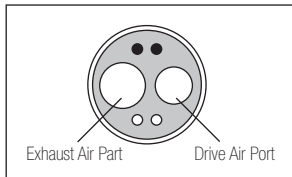


Fig. 7

■ Lubrication Oil

- 1) Remove the motor from the hose.
- 2) Apply 1-2 drops of lubrication oil into the Drive Air Port shown in the Fig.7.
- 3) Connect the motor to the hose. Operate the motor for about 10 seconds.

7-3 Sterilization

Sterilize the product by autoclave sterilization. Remove the handpiece after each patient and sterilize as noted below.

- 1) Insert into an autoclave pouch. Seal the pouch.
- 2) Autoclavable under the conditions below.
Autoclave for more than 20 min. at 121°C, or 15 min. at 132°C, or 3 min. at 134°C.
- 3) The motor should remain in the autoclave pouch until required for use.



CAUTION

- Do not autoclave the product with other instruments even when it is in a pouch. This is to prevent possible discoloration and damage to the product from chemical residue on other instruments.
- Keep the product in suitable atmospheric pressure, temperature, humidity, ventilation, and sunlight. The air should be free from dust, salt and sulphur.
- Do not heat or cool the product too quickly. Rapid change in temperature could cause damage to the product.
- If the sterilizer chamber temperature may exceed 135°C during the dry cycle then delete the dry cycle.
- Autoclave sterilization is recommended for the product. The validity of other sterilization methods is not confirmed.
- Do not touch the product immediately after autoclaving as it will be very hot and must remain in a sterile condition.

NOTICE

NSK recommends Class B sterilizers as stated in EN13060.

8. Replacing the O-rings

Replace the O-rings if water is present in the exhaust air line. This is an indication of possible water leakage within the motor. ALWAYS change the complete set of O-rings.

- 1) Gently remove each O-ring by hand.
- 2) Insert the complete set of new O-rings in the correct grooves.

*Refer to Spare Parts List to identify the correct parts.

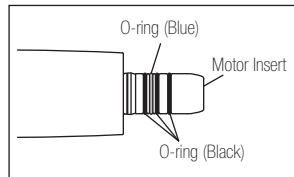


Fig. 8



CAUTION

- Do not force the new replacement O-ring with excessive pressure.
- The blue O-Ring is thinner than the 3 black O-Rings. When inserting new O-rings, make sure they are inserted in the correct grooves as shown in the Fig. 8.

9. Periodical Maintenance Checks

Perform periodical maintenance checks every three months, referring to the check sheet below. If any abnormalities are found, contact your Authorized NSK Dealer.

Points to check	Details
Rotation	Rotate the motor and check for abnormalities such as abnormal rotation, vibration, noise, and overheating.

10. Specifications

Model	X205L
Hose Connection Type	ISO 9168 Type3
Handpiece Connection Type	E Type ISO 3964
Max. Rotation Speed	25,000min ⁻¹
Breakdown Torque	2.0N·cm
Drive Air Pressure	0.20 - 0.25MPa (2.0 - 2.5kgf/cm ²)
Air Consumption	50±5NL/min (0.25MPa)
Water Pressure	0.10 - 0.25MPa (1.0 - 2.5kgf/cm ²)
Chip Air Pressure	0.15 - 0.25MPa (1.5 - 2.5kgf/cm ²)

Coolant Water Supply	50mL/min and more (0.25MPa)
Coolant Air Supply	1.5L/min and more (0.25MPa)
Water Spray Type	Internal Spray
Optic	White LED
Voltage	AC/DC 3.3±0.05V (50/60Hz)
Active Voltage	2.8 - 4.0V
Consumption Current	0.38A Typical (3.3V)
Max. Consumption Current	0.60A (2.8V)
Use Environment	Temperature: 0 - 40°C(No Condensation) Humidity: 30 - 75% Atmospheric Pressure: 700-1,060hPa
Transportation and Store Environment	Temperature: -10 - 50°C Humidity: 10 - 85% Atmospheric Pressure: 500 - 1,060hPa

11. Classification of equipment

- Mode of operation :
 - Intermittent operation (ON:40min, OFF:10min)

12. Symbol



This product is Autoclavable up to Max.135°C.



Conforms to CE European Directive of "Medical equipment directive 93/42/EEC."



Manufacturer.



Authorized representative in the European community.



Caution: U.S. Federal law restricts this device to sale by or on the order of a licensed physician.

13. Warranty

NSK products are warranted against manufacturing errors and defects in materials. NSK reserves the right to analyze and determine the cause of any problem. Warranty is voided should the product be not used correctly or for the intended purpose or has been tampered with by unqualified personnel or has had non NSK parts installed. Replacement parts are available for seven years beyond discontinuation of the model.

14. Option Parts List

Model	Order Code
MG-4H Multi Gauge	Z109400

15. Spare Parts List

Model	Order Code
O-Ring (Blue)	0313084070
O-Ring (Black)	0312074080

16. Disposing product

In order to avoid the health risks of operators handling the disposal of medical equipment, as well as the risks of environmental contamination caused thereof, a surgeon or a dentist is required to confirm the equipment is sterile. Ask specialist firms who are licensed to dispose of specially controlled industrial wastes, to dispose the product for you.

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