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OPERATION MANUAL

NSK

High Speed Air Turbine Handpiece

DynaLED

DynaLED

CE 97

Please read this Operation Manual carefully before use, and file for future reference.

MADE IN JAPAN

[M] 6384E 08

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Intended to use: This handpiece is designed only for clinical dental use by qualified personnel.

⚠ CAUTION

- When operating the handpiece always consider the safety of the patient.
- Check for vibration, noise and overheating outside the patient's oral cavity before use. If any abnormalities are found, stop using the handpiece immediately and contact dealer.
- Should the handpiece function abnormally, cease operation immediately and return the handpiece to an authorized dealer for repair.
- Depressing the push-button while the handpiece is rotating will result in OVERHEATING of the handpiece head. Special caution must be exercised during use to keep cheek tissue AWAY from the push-button of the handpiece. Contact with cheek tissue may cause the push-button to depress and burn injury to the patient may occur.
- Do not applying excessive power in the direction which bur removes. When the bur drops into patient's oral cavity, they may drink by mistake and get injured.
- This handpiece have built-in dynamo. Consumption Air generates electricity and LED become luminous. Therefore, do not perform autoclave sterilization which it heat and cools rapidly.
- Do not allow any impact on to the Handpiece. Do not drop the Handpiece.
- Do not look into LED light directly.

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- When abnormalities are in LED (dark, do not light on or flashing or so), contact dealer to repair.
- Do not attempt to disassemble the handpiece or tamper with the mechanism except NSK recommend on this Operation Manual.
- Always keep bur shanks clean. Dirt or debris in a chuck could cause poor bur concentricity or low chuck retention force.
- Do not exceed the drive motor speed recommended the bur manufacturers. If the rotary speed which the manufacturer of bur nominates is lower than spec of handpiece, do not use it.
- Do not connect or disconnect the handpiece or bur until the motor has completely stopped.
- NSK has not recommended the repair and disassembly of the cartridge without exception. Handpiece may perform abnormally (abnormal noise or abnormal vibration). Damage, failure or accidents are outside of our guarantee.
- Do not wipe with, or clean or immerse in, high acid water or sterilizing solutions.
- Use eye protectors, mask for safety when operating this handpiece.
- User is responsible for operation, maintenance and safety.
- If the handpiece has not been used for a long period, check for noise, vibration, and overheating before use.
- Treatment under the sufficient irrigation water(Spraying water).

1. Specification

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Model	M500LG M4	M600LG M4	M500LG B2	M600LG B2	M500LG QD	M600LG QD
Head Type	Mini	Standard	Mini	Standard	Mini	Standard
Connection Type	ISO9168 Type 2 4 hole		ISO9168 Type 1 2 hole		QD Coupling	
Rotation Speed	380,000 - 450,000 min-1	330,000 - 430,000 min-1	380,000 - 450,000 min-1	330,000 - 430,000 min-1	380,000 - 450,000 min-1	330,000 - 430,000 min-1
Drive Air Pressure	0.20MPa(2.0kgf/cm²) - 0.25MPa(2.5kgf/cm²)					
Water Spray Type	Quattro Spray					
Chuck Type	Push Button Chuck					
Bur Type	ISO 1797-1 Type3 ϕ 1.59-1.60mm Short Shank Bur	ISO1797-1 Type3 ϕ 1.59-1.60mm Standard Bur	ISO 1797-1 Type3 ϕ 1.59-1.60mm Short Shank Bur	ISO1797-1 Type3 ϕ 1.59-1.60mm Standard Bur	ISO 1797-1 Type3 ϕ 1.59-1.60mm Short Shank Bur	ISO1797-1 Type3 ϕ 1.59-1.60mm Standard Bur
Min. Chucking Length	9.0mm	10.5mm	9.0mm	10.5mm	9.0mm	10.5mm
Max. Bur Length	21mm	25mm	21mm	25mm	21mm	25mm
Max. Working Part Diameter	ϕ 2mm					
Max. Air Consumption(0.25MPa)	45±5NL/min		50±5NL/min		40±5NL/min	
Head Diameter x Height)	ϕ 10.6mm x 12.4mm	ϕ 12.1mm x 13.3mm	ϕ 10.6mm x 12.4mm	ϕ 12.1mm x 13.3mm	ϕ 10.6mm x 12.4mm	ϕ 12.1mm x 13.3mm
Water Pressure	0.05MPa(0.5kgf/cm²) - 0.20MPa(2.0kgf/cm²)					
Chip Air Pressure	0.15MPa(1.5kgf/cm²) - 0.25MPa(2.5kgf/cm²)		-		0.15MPa(1.5kgf/cm²) - 0.25MPa(2.5kgf/cm²)	
Optic	Glass Rod					

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2. Connecting/Disconnecting Handpiece

M500LG M4/B2, M600LG M4/B2

2-1 Connecting
1) Insert the handpiece into the hose connector.
2) Tighten the Hose Nut. (Fig.1)

2-2 Disconnect
Loosen the Hose Nut and pull out the Hose.

M500LG QD, M600LG QD

2-3 Connecting
1) Insert the Coupling into the Hose Connector.
2) Tighten the Hose Nut.
3) Pull the Connector Ring.
4) Push into the handpiece into Coupling.

2-4 Disconnect
Slide back the Connector Ring as shown in Fig.2.

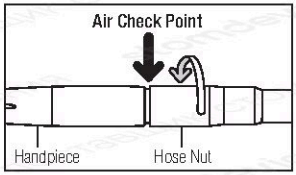


Fig. 1

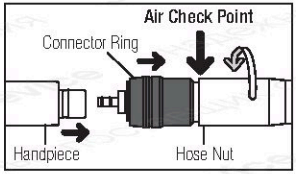


Fig. 2

SUPPLY AIR PRESSURE Setting

Set the Air pressure at the "Air Check point" on Fig. 1 and Fig. 2 The setting values are on the specification table. Do not exceed the recommended air pressure by using Multi Gauge.
Multi Gauge: Midwest 4 Hole Order code Z109400 / Borden2/3 Hole Order code Z109200

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⚠ CAUTION

- Ensure connect "Coupling and Hose" or "Handpiece and Coupling" firmly.
- Do not pull the Connector Ring while the handpiece is under air pressure. It may jump the handpiece out from the connector because of the air pressure.
- Do not exceed the recommended air pressure. If it exceeds the pressure, it may bur jump out from the handpiece.
- Ensure clean, dry air supply. Moisture and debris in air supply may cause the motor to malfunction.

3. Check before treatment

Follow the check below, before use. If any abnormalities are found, stop using the handpiece immediately and contact the authorized NSK dealer.

1) Insert the Bur. (Do not exceed maximum rotation speed for any item.)
2) Check that there is no abnormal rotation, vibration, noise and overheating.
3) If there are no immediate apparent abnormalities, continue to rotate the handpiece for about 1 minute. Then check that there is no abnormal heating on the outer surface.
4) Operate it if there are not abnormalities above.

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4. Insertion /Removal of the Bur

⚠ CAUTION

- Do not use non-standard burs. The ISO standard shank diameter is ϕ1.59 - ϕ1.60 mm.
- Do not exceed the bur speed recommended by the bur manufacturer. Moreover, do not use the bur which it has lower rotation speed.
- Do not use long surgical burs. Do not use burs longer than 26mm.
- Do not use short shank burs. (M600LG M4, M600LG B2, M600LG QD)
- Always keep the bur shank clean. Entry of hard debris into the chuck via the bur shank could cause rotation slip and also prevent the bur from being securely located in the chuck.
- Fully depress the Push Button and insert the bur into the chuck until it is secure.
- Test that the bur is secure by gently pulling and pushing the bur without depressing the Push Button.

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4-1 To insert the Bur
1) Insert the bur until it stops.(❶)
2) Depress the Push Button.(❷)
3) Insert the bur into the chuck until it is stops.(❸)
4) Release the button.

4-2 To remove the Bur
Depress the Push Button firmly and remove the bur.(❷)

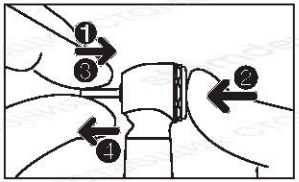


Fig. 3

⚠ CAUTION

- Do not connect or disconnect the handpiece or bur until the motor has completely stopped.
- When used for crown removal and other procedures that would involve heavy vibration, the bur may become difficult to remove. Push the button firmly, and forcibly pull out the bur with a pair of pliers. Apply small amount of spray lubricant into the chuck. This can be prevented if the bur is repositioned a few times during the procedure.

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5. Maintenance

After the treatment of each patient, perform maintenance below.

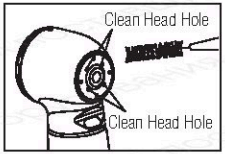
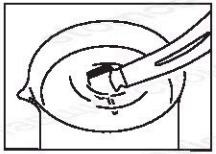


Fig. 4


Fig. 5

5-1 Cleaning (Clean-Head System)

1) Scrub dirt and debris from the handpiece.(Fig.4)
2) Half fill a cup with clean water.
3) Rotate the handpiece and immerse half of the handpice head. (Fig. 5)
4) Rotate and stop intermittently the handpiece about 2 to 3 seconds. (About 3 times)
5) By the function of the clean head system, the clean head hole can be washed.
6) Stop the handpiece and wipe it dry. If the dirt could not remove from the hole, remove the cartridge and clean by brush.
7) Perform lubrication (4-3 Lubrication) and sterilization. (5-4 Lubrication, 5-5 Sterilization)

⚠ CAUTION

Use only clean water to maintain the Clean Head System.

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5-2 Cleaning (Glass Rod)

Wipe clean the Cellular Glass Optic Rod entry point and exit point with an alcohol-immersed cotton swab. Remove all debris and oil.(Fig.6)

⚠ CAUTION

Do not use a pointed tool or sharp edged to clean the Cellular Glass Optic Rod. They may damage the mirror finish and reduce the light transmission efficiency. If Cellular Glass Optic Rod end has become damaged, return it to dealer for repair.

5-3 Cleaning

This handpiece can be washed via Thermo Disinfector.

Scrub dirt and debris from the handpiece, and wipe clean with alcohol-immersed cotton swab or cloth. Do not use a wire brush.

* Refer the manual of Thermo-Disinfector for performing it.

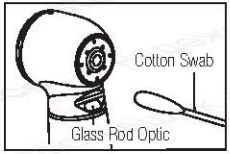


Fig. 6

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5-4 Lubrication

■ Lubricate by PANA SPRAY Plus

M500LG M4/B2, M600LG M4/B2

1) Mount the Arrow Head Spray Nozzle into the Spray Port.(Fig.7)
2) Remove the Bur from the handpiece.
3) Insert the Arrow Head Spray Nozzle in the drive Air Tube of the handpiece and spray for approximately 2-3 seconds.

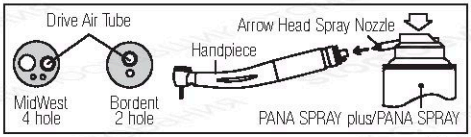


Fig. 7

M500LG QD, M600LG QD

1) Mount the Spray Nozzle into the Spray Port.(Fig.8)
2) Remove the bur from the handpiece.
3) Insert the Spray Nozzle in rear of the handpiece and spray for approximately 2-3 seconds.

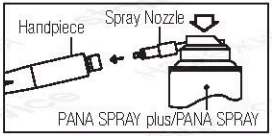


Fig. 8

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⚠ CAUTION

- Be sure to hold the handpiece firmly to prevent the handpiece from slipping out of hand by the spray pressure when lubricating.
- Supply lubricant until it comes out of the handpiece head.(at least 2 seconds)
- Hold the spray can upright.

■Lubricate by Care3 plus

NSK Care3 Plus automatic handpiece cleaning and lubrication system.
After connecting the handpiece to the correct adaptor, activate the Care3 System per the Care3 System Operation Manual.

5-5 Sterilization

135°C This handpiece and motor can be autoclavable up to Max.135°C.

Autoclave sterilization is recommended. Sterilization is required first time you use and after each patient as noted below.

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■ Autoclave Procedure:

1) Clean and lubricate the handpiece.
2) Insert into an autoclave pouch. Seal the pouch.
3) Autoclavable up to max. 135˚C.
   ex.) Autoclave for 3 min. at 134°C.
4) Keep the handpiece in the autoclave pouch to keep it clean until you use it.

* EN13060/EN ISO17665-1 recommends autoclaving for 3 minutes (minimum holding time) at 134°C.
  NSK recommends Class B sterilization.

⚠ CAUTION

- To prevent infectiveness, Autoclave the handpiece every patient.
- Do not autoclave the handpiece, even when it is bagged, together with other instruments, from which chemicals are not sufficiently cleaned. This is to avoid discoloration and/or damage to the plating of the handpiece.
- In case the sterilizer chamber temperature could exceed 135°C during the dry cycle, skip the dry cycle.
- Do not heat or cool the handpiece quickly. Rapid change in temperature could break the glass rod or dynamo or LED parts.

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- Do not wash, soak, or wipe off the handpiece with/in the oxidation potential solution (strong acid, super acid solution) sterilized solution, strong alkaline solution or functional water.
- The handpiece is kept in suitable atmospheric pressure, temperature, humidity, ventilation, and sunlight. Moreover, air does not include a dust, salt and sulfur.
- Do not touch the handpiece just after the autoclave. It may very hot.
- NSK do not recommend you to sterilize on plasma sterilization or EOG sterilization.

6. Changing Turbine Cartridge

1) Mount a dummy bur in the chuck.
2) Turn the Wrench counter clockwise and remove the Head Cap by Head Cap Wrench.
3) Push up the dummy bur to remove Cartridge.
4) Clean the head interior. (Wipe extra oil after lubrication)
5) Align the Alignment Pin and insert Cartridge. (Fig. 8)
6) Turn the Wrench clockwise and mount the Head Cap. (Fig. 9)

* Replacement Cartridge: SX-MU03 Mini Cartridge Order Code P1001250
SX-SU03 Standard Cartridge Order Code P1002250

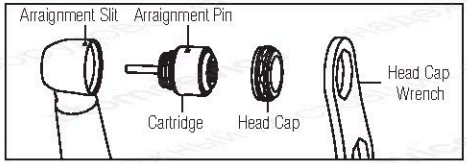


Fig. 9

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⚠ CAUTION

- Tighten the head cap after changing the cartridge. If attachment is loose, there are the causes of an injury in oral cavity or possibility of accidental ingestion.
- Use only NSK purity cartridge. Competitive cartridge is not covered under warranty.
- The screw of head cap is very small. Do not bind tight using a Wrench from the start. After tightening by the hand, use the Wrench.
- Check that the O-Rings are placed correct position and then install the cartridge.(Fig.10)

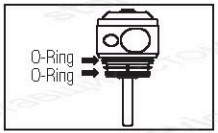


Fig. 10

7. Spray Port Cleaning

When spray port are clogged, or spray does not exit evenly from three ports, clean the ports as follows:
1) Remove the bur from the chuck. (Refer to "4. Insertion/Removal the Bur" and "6. Replacing the Cartridge")

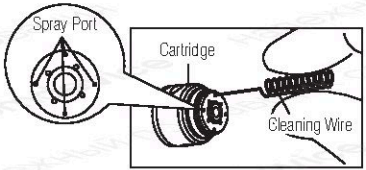


Fig. 11

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2) Take out the cleaning wire from the back end of the brush holder. Insert the wire straight into the spray ports with caution. Do not forcibly insert the wire into the port. Damaged or disoriented port could cause the spray diverge or directed away from the bur, and the cooling efficiency deteriorates.
3) After use, clean the cleaning wire. Push into the brush holder with the pointed end of the wire inward.

8. Replacing the O-rings (QD Coupling)

Worn or damaged O-ring may cause air or water to leak.
When water is found in the exhaust air or water leak from the coupled point, replace four O-rings as shown in Fig.10.
Replacement O-ring Set (4pcs) : Order Code Y900592

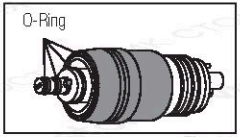


Fig. 12

9. Non-Retraction Valve (QD Coupling)

To prevent oral fluids drawn into the water line, QD coupling has Non-Retraction valve. If water is beginning to leaking from handpiece, replace non-retraction valve.
1) Remove the back-end gasket.
2) Replace Non-Retraction Valve.

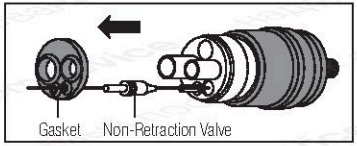


Fig. 13

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10. Warranty

NSK warrants our product against poor manufacturing, poor workmanship and defects in materials. NSK reserves the right to analyze and determine the cause of any problem. Warranty is voided should the handpiece be not used correctly. Replacement parts are available for seven years beyond discontinuation of the model.

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CE 0197 The EU directive 93/42/EEC was applied in the design and production of this medical device.

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