

High Speed Air Turbine Handpiece

PHATELUS

MACH-LITE XT

MLXT-MU
MLXT-SU
MLXT-TU

135°C : AUTOCLAVABLE

OM-T0117E Rev.B

OPERATION MANUAL



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

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

1. CAUTIONS

- Prior to each use, all instrument and accessories must be inspected for proper operation.
- When using the handpiece, protect the patient at all times.
- Before each use, be sure that burs are completely seated and locked in the instrument.
- Only use burs from reputable manufacturers with a shaft diameter of 1.59 ~ 1.60mm, a max. total length of 26mm (1.02") (standard or torque heads) and a max. head diameter of the 2mm (.0787") burs which deviate from the stated measurements must not be used.
- After extended use the handpiece may become noisy, replace the cartridge with a new one manufactured by NSK. Failure to replace the cartridge may cause accidents or impair operator's hearing.
- Depressing the push-button while handpiece bur is in rotation 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 injury to the patient may occur.
- NSK turbines should not be rebuilt. Replacing bearings only could result in unexpected failure and patient injury due to different wear factors of new vs. old components.
- Do not extend burs outward from handpiece head. Burs must be inserted all the way into chuck for proper bur retention. Extended burs could result in bent burs, inadequate cooling or personal injury due to bur ejection.

2. Features

The MACH-LITE XT high-speed air turbine handpiece is the most advanced infection-control handpiece available on the market.

- Cellular Optic Glass Rods are brighter and the most durable through repeated sterilization.
- Ceramic Ball Bearing extends service life to the handpiece.
- The CLEAN-HEAD system, incorporated in the capsule type cartridge, prevents suction of oral fluids and debris in a patient's mouth into the head exhaust line of the handpiece body, and hose into dental unit.(PAT.)
- The body is made of a special stainless steel, finish resistance to autoclave sterilization is increased remarkably.
- The NON-RETRACTION VALVE, incorporated in the PHATELUS Coupling, a quick connect coupling for PHATELUS series handpiece, which prevents suction of oral fluids in a patient's mouth into the water line of the handpiece at the spray water outlet port.
- Water spraying is made as an integral part of the cartridge. Clogging of the water line and the spray port is thus minimized. The spray port is renewed at each cartridge replacement.
- Provision of the spray port in the cartridge brings the spray port much closer to the bur. The visibility angle is greatly improved even with three-port spraying.(PAT.)
- PHATELUS MACH-LITE XT handpiece and PHATELUS Coupling are autoclavable.(up to 135°C)
- Push button type chucking system "ULTRA PUSH" cartridge.
- Twist free, 360° rotation to minimize hose drag.

3. Specifications

Model	MLXT-MU	MLXT-SU	MLXT-TU
Head Type	Mini	Standard	Torque
Speed	*380,000-450,000min ⁻¹ (rpm)	*380,000-450,000min ⁻¹ (rpm)	*300,000-380,000min ⁻¹ (rpm)
Drive Air Pressure	0.2-0.25MPa(2-2.5kgf/cm ²)	0.2-0.25MPa(2-2.5kgf/cm ²)	0.2-0.25MPa(2-2.5kgf/cm ²)
Spray Type	Triple Water Spray	Triple Water Spray	Triple Water Spray
Chuck	Ultra Push(Push button chuck)	Ultra Push(Push button chuck)	Ultra Push(Push button chuck)
Bur Size	φ 1.59- φ 1.60 Short Shank Bur	φ 1.59- φ 1.60 Standard Bur	φ 1.59- φ 1.60 Standard Bur
Light	Glass Rod Optic	Glass Rod Optic	Glass Rod Optic
Head Diameter	φ 11.2mm	φ 11.2mm	φ 13.2mm
Head Height	12.5mm	14.6mm	14.6mm
Weight (Head)	43 g	43 g	54 g

* Speed may slightly vary depending on the back-end configuration and type of hose used.

4. PHATELUS Coupling

- (1) PHATELUS coupling to handpiece hose
Align the tubes at the back end of the coupling with the corresponding holes in the hose connector. Insert the coupling into the hose connector and tighten the hose nut by turning it clockwise as shown in Fig. 1 .
- (2) Connecting coupling to the handpiece
Insert the handpiece into the coupling until a click is heard as shown in Fig. 2 .
- (3) Disconnecting handpiece from coupling
When the handpiece is to be disconnected from the coupling for autoclaving or changing the handpiece, slide back the connector ring as shown in Fig. 3 , and the handpiece pops out.

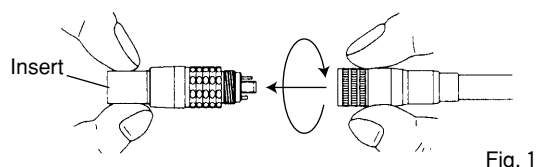


Fig. 1

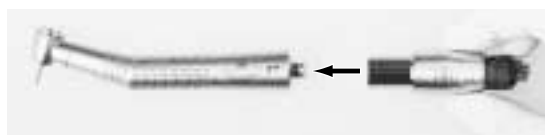


Fig. 2



Fig. 3

CAUTION

DO NOT slide back the connector ring while the handpiece is under air pressure. The handpiece may be ejected from the coupling as a result of the pressurization.

5. Drive Air Pressure

Using the NSK pressure gauge, calibrate the drive air pressure to 0.2-0.25MPa (2-2.5kgf/cm²) at the arrow point.
If a pressure gauge is not available, the pressure can be set between 0.22-0.26MPa (2.2-2.7kgf/cm²) at the chair side pressure gauge. (Fig. 4)



Fig. 4

CAUTION

DO NOT exceed the recommended air pressure to prevent premature ball bearing failure.

6. Cautions on Burs

- DO NOT use non-standard burs. The ISO standard shank diameter is φ 1.59-1.60mm.
- DO NOT use bent, worn, or damaged burs.
- Always use clean burs. Uncleaned burs may cause unwanted amount of pressure on the chuck.
- Insert a bur all the way into the chuck until it stops.
- DO NOT use short shank burs in MLXT-SU or MLXT-TU handpiece.
- Use short shank burs in Mini head handpiece (MLXT-MU) .

7. Changing Burs

- (1) Removing Burs
Push the push button in the head cap with thumb to click, and remove the bur. (Fig. 5)
* Note : Push button spring is of a double action. Push until the button is in flush with the head cap. (Fig. 6)

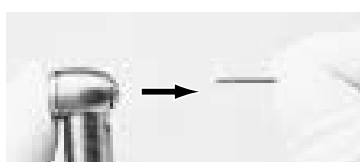


Fig. 5



Fig. 6

- (2) Mounting Burs
Insert the bur into the head until it stops(4 - 5 mm deep). Push the push button and further insert the bur all the way into the head until it stops.
After the bur is held in place in the chuck, push the bur further into the chuck before use, so that the chuck grip power will increase. (Fig. 7)

CAUTION

In case a cutting is performed under heavy vibrations such as in crown removal, there may be a case where the bur gets stuck in the head. Pull it out with pliers with the push button kept pushed hard. This case may be prevented if you often change the position of the bur in the chuck.



Fig. 7

8. Lubrication

Supply PANA SPRAY or/and Care3 Plus after each use and/or before autoclaving. Remove the handpiece from the coupling and lubricate as follows :

■ PANA SPRAY (Fig. 8)

- ① Attach the PHATELUS nozzle into the spray outlet of PANA SPRAY.
- ② Insert the PHATELUS nozzle into the handpiece back end.
- ③ Spray for 1 - 2 seconds. Hold the spray can upright. (Fig.8)

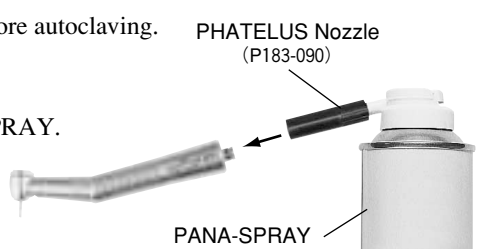


Fig. 8

■ 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 instructions.

9. Sterilization

Sterilization by autoclave is recommended.
Sterilization required after each patient as noted below.

AUTOCLAVING :

- ① Brush off excess dirt and wipe clean with alcohol-soaked cloth.
- ② Remove the handpiece from the coupling and lubricate with PANA-SPRAY as described in the Lubrication section.
- ③ Insert the handpiece in a sterilization pouch and seal it.
- ④ Autoclavable up to a max. 135°C.
Ex.) Autoclave for 20 min. at 121°C, or 15 min. at 132°C.
- ⑤ Keep the handpiece in the autoclave pouch to keep it clean until you use it.

CAUTIONS

- Skip dry cycle.
- Heating element may be located the bottom of the chamber, and the temperature there locally may exceed the set value. Place the handpiece on the central or upper tray.
- 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.

* Sterilization at 121°C for more than 15 minutes is recommended by EN13060 or EN554.

* Performing sterilization according to our instruction has minimal effect on the instruments. Life span is generally determined by wear and damage due to use.

10. Clean slit after each patient

It is important to clean the slit in the head as follows after each patient and before autoclaving to appreciate lasting CLEAN-HEAD performance. (Fig. 9)

- ① Brush off the debris at the slits as shown in fig.10 .
- ② Run the handpiece at the rated pressure.
- ③ Immerse half of the head in clean water while the handpiece is running.
- ④ Run the handpiece in the water 4-5 seconds. (Fig.11)
- ⑤ Remove the handpiece, while running, from the water. Stop and wipe dry the handpiece.
- ⑥ Lubricate before autoclaving.

* Note : Change water each time.



Fig. 9



Fig.10



Fig.11



This product can be washed Via Thermo Disinfector.

11. Replacing Cartridge

(1) Removing the cartridge

- ① Mount a dummy bur in the chuck.
- ② Set the wrench on the head cap, turn the wrench counter-clockwise and remove the cap. (Fig.12)
- ③ Push up the dummy bur, and the cartridge is easily removed from the head.
- ④ Clean the head interior, when dirty, with PANA-SPRAY.

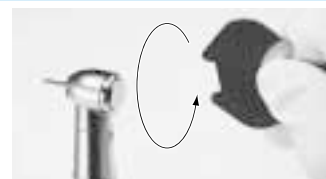


Fig.12

(2) Inserting the new cartridge

- ① Insert the new cartridge, with its pin aligned in the slot of the handpiece head, straight into the handpiece.
- ② Hand tighten the cap until finger tight and secure with wrench until the cap sets in place. (Fig.13)

*Optional Cartridge : NMC-MU03 (Cartridge for Miniature head) Order No.P047

NMC-SU03 (Cartridge for Standard head) Order No.P045

NMC-TU03 (Cartridge for Torque head) Order No.P046

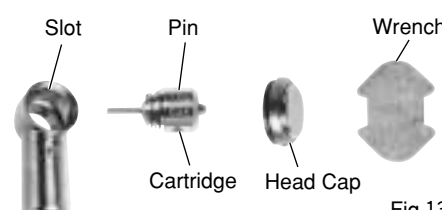


Fig.13

CAUTIONS on Replacing Cartridge

- The head cap screw thread is very fine. To prevent it from breaking, use of the wrench from the first thread is not recommended.
- Before inserting a new cartridge, clean the head interior.
- Make sure that three O-rings (Fig.14) are in place on the cartridge. They are for the cooling water and chip air.

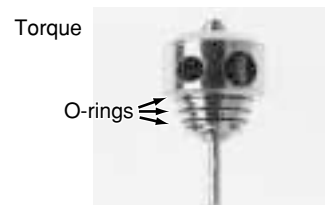
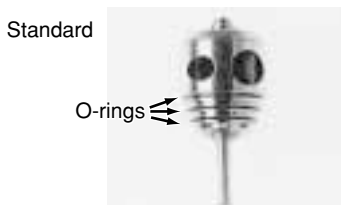
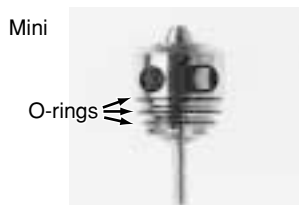


Fig.14

12. Replacing Halogen Lamp

A halogen lamp is inside the quick-connect coupling.

- ① Remove the handpiece from the coupling.
Turn the serrated ring on the connector clockwise and remove the back end.
The lamp is in the back end member. (Fig.15)
- ② Pull out the lamp (Fig.16)
- ③ Insert a new lamp and align its pins with the socket holes.
Push it in. (Fig.17)
- ④ Assemble in the reverse order. Be sure to align the tubes in the male member with the corresponding holes in the back end member.
Tighten the serrated ring securely.

*Optional Lamp : PTL Bulb (Pack of 3) Order No. Y900-529

CAUTION

Air or water leak may occur if connection is loose.

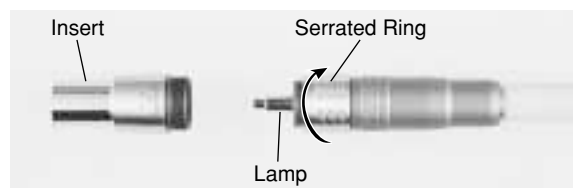


Fig.15

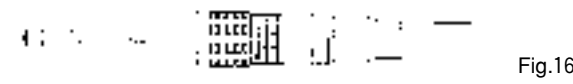


Fig.16

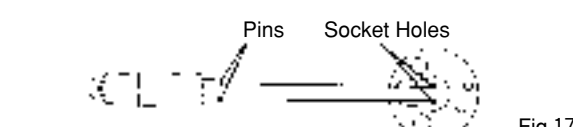


Fig.17

13. Replacing worn O-ring in the handpiece

- ① Remove the handpiece from the coupling. Unscrew the tapered body of the handpiece by turning it counter-clockwise. (Fig.18)
- ② Push out the worn O-ring with your thumb. (Fig.19)
- ③ Insert new O-ring in the O-ring groove.



Fig.18



Fig.19

- ④ Screw the tapered body securely back onto the handpiece. (Fig.20)
Make sure it is securely tightened.

*Optional O-ring : PTL O-ring Set (Pack of 5) Order No. Y900-580

CAUTION

A loose connection may result in an air or water leak, or, in some case, the handpiece may get stuck on the coupling.



Fig.20

14. Cleaning of the Glass Rod Optic end

In case the light has become dim, clean the Glass Rod Optic end with an alcohol-soaked cotton swab. (Fig.21)

Do not use a pointed tool or sharp edges to clean the Glass Rod Optic end. They may damage the mirror finish and reduce the light transmission efficiency.

If the Glass Rod Optic end has become damaged, send the handpiece to your local distributor for repair.



Fig.21

15. Cleaning of Spray Ports

When spray nozzle are clogged, or spray does not exit evenly from three ports, clean the ports as follows :

- ① Remove the bur or bur blank from the chuck. Remove the head cap, and the cartridge from the head. As disc ribed in the Replacing Cartridge.
- ② Take out the cleaning wire from the back end of the brush holder. Insert the wire straight into the spray nozzle 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. See Fig.22.
- ③ Make sure that cleaning wire reaches the deepest groove,the chip air groove, (Fig.23). Brush off the debris.
- ④ After use, clean the cleaning wire. Push into the brush holder with the pointed end of the wire inward.

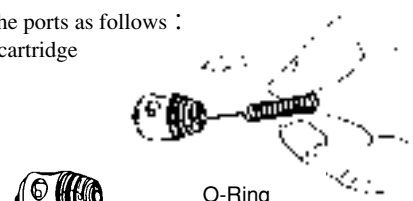


Fig.22

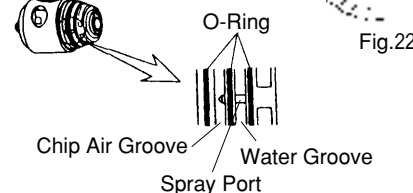


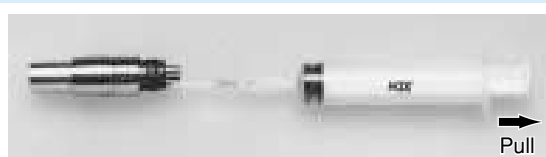
Fig.23

16. Non-Retraction Valve

A Non-Retraction Valve is equipped in the PHATELUS Coupling Joint, which shuts off the water retraction right at the handpiece head, to prevent oral fluids sucked into the water line. Once in a while, use a syringe to check its effectiveness and inject air to clean the valve seat. (Fig.24)

When the valve does not seem functioning, use the syringe and inject air into the water tube of the back-end. Most dirt may be blown out of the seat.

To the valve, remove the back-end gasket. Pull and remove the water tube, and replace the Non-Retracton Valve. (Fig.25)



Note : Syringe is not supplied with the handpiece. Fig.24

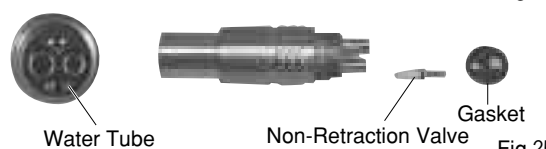


Fig.25

* Specifications may be changed without notice.



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