High Speed Air Turbine Handpiece Titanium Body

Ti-Max A 500 ／ A 500 L A 600 ／ A 600 L A 700 ／ A 700 L

135℃ : AUTOCLAVABLE

OM-T0127E Rev.A

OPERATION MANUAL

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

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

1．⚠ CAUTIONS

- This handpiece is designed only for dental clinical use.
- Prior to each use, ensure that all instrument and accessories must be in proper conditions before operation as per instructions enclosed.
- Consideration for the patient's safety must be taken, when using the handpiece.
- Before each use, be sure that burs are properly seated and secured in the handpiece.
- Use burs from reputable manufactures, with ISO standard of shaft diameter of 1.59～1.60㎜, a max. total length of 26㎜(1.02")(Standard or Torque heads) and a max. head diameter of the 2㎜ (.0787"). Burs which does not agree from the stated measurements should 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 or recycle by un-qualified NSK technican. Replacing or mishandling the bearings only may result in unexpected failure causing patient injury due to different in wear factors of new vs. old components, or mishandling.
- Burs must be inserted all the way into chuck for proper bur retention.
  Extending the bur, in-stablelaty could result in bent burs, indequate cooling and improper grip of the bur resulting in personal injuries.

2． Features

The Ti-Max handpiece outer casing is manufactured with advance technology and metallagy: TITANIUM

- Titanium is used for its stablity, hardness and light weight as compared to other material.
- Titanium is also non-allergic to aloy sensitive patient.
- The CLEAN-HEAD (PAT.) system, incorporated in the handpiece, prevent suction of oral fluids and debris in a patient's mouth into the turbine exhaust line of the handpiece and tubings of the dental unit and environment.
- The NON-RETRACTION VALVE incorporated in the coupling joint end, a quick connect coupling for Ti-Max series handpiece, effectively prevent back blow of oral fluids from the patient's mouth through the water spray outlet of the handpiece head.
- Water spray system is made as an integral part of the cartridge. Clogging of the water line and the spray outlet is thus minimized. The spray system is renewed at each cartridge replacement.
- Provision of the spray outlet in the cartridge brings the spray outlet much closer to the bur.
  The visibility angle is greatly improved even with three jet spraying (PAT.).
- Ti-Max handpieces are autoclavable up to 135℃.
- Improved Glass Rod Optics located at the head greatly illuminates the working area, improved visibility for diagnosis and treatment,
  causing less eye strain to the operator. (A500L, A600L, A700L)
- Push button type chucking system "ULTRA PUSH" cartridge.
- Twist free, 360° rotation minimizes hose drag.

3． Specifications

Type	A500	A600	A700	A500L	A600L	A700L
Rotation	*380,000-450,000min⁻¹(rpm)	*380,000-450,000min⁻¹(rpm)	*300,000-380,000min⁻¹(rpm)	*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 (2.0-2.5kgf/㎠)	0.2－0.25MPa (2.0-2.5kgf/㎠)	0.2－0.25MPa (2.0-2.5kgf/㎠)	0.2－0.25MPa (2.0-2.5kgf/㎠)	0.2－0.25MPa (2.0-2.5kgf/㎠)	0.2-0.25MPa (2.0-2.5kgf/㎠)
Head Diameter	φ10.3㎜	φ11.2㎜	φ13.2㎜	φ10.3㎜	φ11.2㎜	φ13.2㎜
Head Height	11.3㎜	14.4㎜	14.6㎜	11.3㎜	14.4㎜	14.6㎜
Weight (Head)	41g	42g	44g	44g	44g	46g
Chuck Type	Push Button Type	Push Button Type	Push Button Type	Push Button Type	Push Button Type	Push Button Type
Spray Type	Triple Spray	Triple Spray	Triple Spray	Triple Spray	Triple Spray	Triple Spray
Light	—	—	—	Glass Rod Optics	Glass Rod Optics	Glass Rod Optics
Bur Size	φ1.59－φ1.60 Short Shank Bur	φ1.59－φ1.60 Std. Bur	φ1.59－φ1.60 Std. Bur	φ1.59－φ1.60 Short Shank Bur	φ1.59－φ1.60 Std. Bur	φ1.59－φ1.60 Std. Bur

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

4． Connect the Coupling Joint

(1) Coupling Joint 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.

(2) Connecting Coupling Joint to the handpiece
Insert the handpiece into the coupling until a click is heard as shown in Fig.1.

(3) Disconnecting handpiece from coupling joint
When the handpiece is to be disconnected from the coupling for autoclaving or changing the handpiece, slide back the cennector ring as shown in Fig. 2 , and the handpiece pops out.

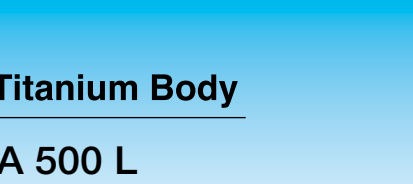


Fig. 1

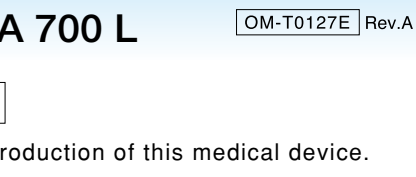


Fig. 2

⚠ 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 (2.0－2.5kgf/㎠) at the arrow point.
If a pressure gauge is not available, the pressure can be set between 0.22－0.27MPa (2.2－2.7kgf/㎠) at the chair side pressure gauge.（Fig. 3 ）

⚠ CAUTION

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

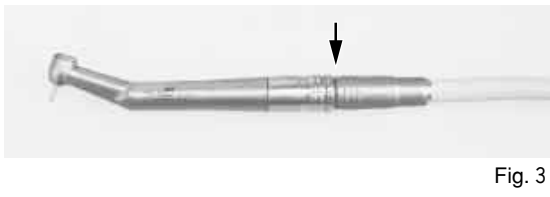


Fig. 3

6． ⚠ Cautions on Burs

- DO NOT use non-standard burs. The ISO standard shank diameter is φ1.59－1.60㎜.
- 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 STANDARD or TORQUE handpiece.
- Use short shank burs in Mini head handpiece（A500, A500L）.

7． Changing Burs

(1) Removing Burs
Push the push button in the head cap with thumb to click, and remove the bur.（Fig. 4 ）
＊Note：Push button spring is of a double action. Push until the button is in flush with the head cap.（Fig. 5 ）

(2) Mounting Burs
Insert the bur into the head until it stops（4 - 5 ㎜ 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. 6 ）

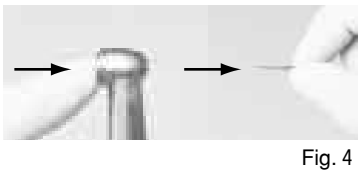


Fig. 4

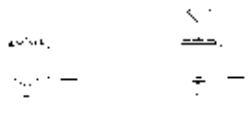


Fig. 5

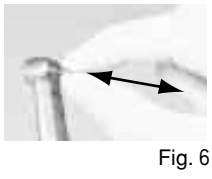


Fig. 6

⚠ 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.

8． Lubrication

Supply PANA SPRAY or/and Care3 Plus after each use and/or before autoclaving.

■PANA SPRAY (Fig. 6)
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. 7 ）

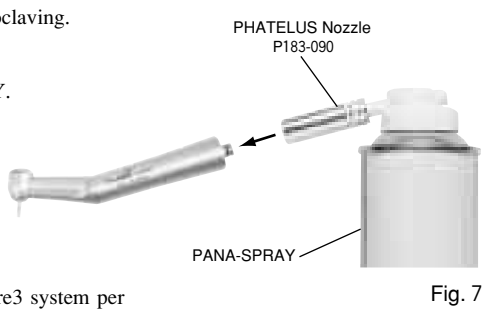


Fig. 7

■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℃.
ex.) Autoclave for 20 min. at 121℃, or 15 min. at 132℃.
⑤ Keep the handpiece in the autoclave pouch to keep it clean until you use it.
※ Sterilization at 121℃ 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.

⚠CAUTION

- 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 handpiese on the central or upper tray.

10. Clean up 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. 8）

① Brush off the debris at the slits as shown in Fig. 9 .
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.10)
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. 8


Fig. 9


Fig.10

This handpiece 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.11）
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.

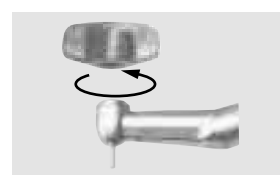


Fig.11

(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.12)

※Optional Cartridge : Ti-MU03 (Cartridge for Miniature head) Order No.P057
Ti-SU03 (Cartridge for Standard head) Order No.P058
Ti-TU03 (Cartridge for Torque head) Order No.P059

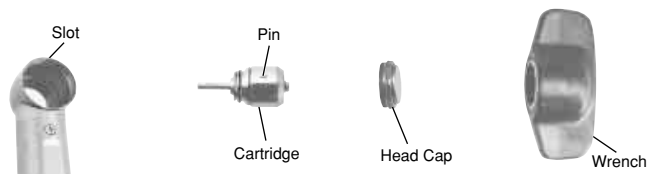


Fig.12

⚠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 two O-rings（Fig.13）are in place on the cartridge.

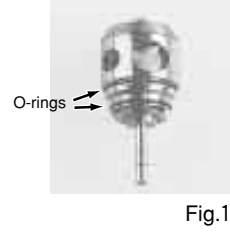


Fig.13

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.14)
② Pull out the lamp. (Fig.15)

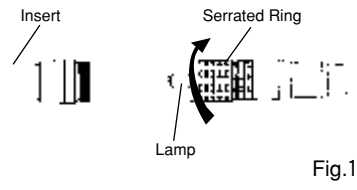


Fig.14


Fig.15

③ Insert a new lamp and align its pins with the socket holes.
Push it in. (Fig.16)

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

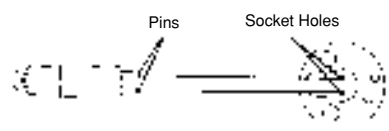


Fig.16

⚠CAUTION

Air or water leak may occur if connection is loose.

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.17)
② Push out the worn O-ring with your thumb. (Fig.18)
③ Insert new O-ring in the O-ring groove.

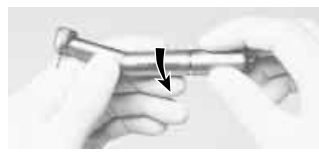


Fig.17


Fig.18

④ Screw the tapered body securely back onto the handpiece. (Fig.19)
Make sure it is securely tightened.

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

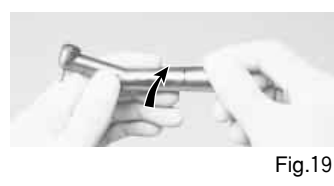


Fig.19

⚠CAUTION

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

14. Cleaning of the fiber optic end（A500L，A600L，A700L）

In case the light has become dim, clean the fiber optic end with an alcohol-soaked cotton swab. (Fig.20)
Do not use a pointed tool or sharp edges to clean the fiber end. They may damage the mirror finish and reduce the light transmission efficiency.
If the fiber optic end has become damaged, send the handpiece to your local distributor for repair.

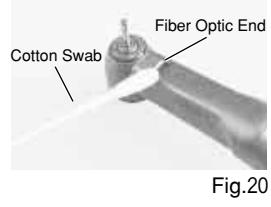


Fig.20

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.21.
③ Make sure that cleaning wire reaches to the groove, and brush off the debris.
④ After use, clean the cleaning wire. Push into the brush holder with the pointed end of the wire inward.

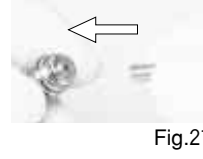
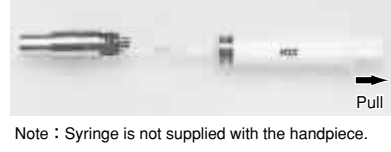


Fig.21

16. Non-Retraction Valve

A non-retraction valve is equipped in the 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.22)

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 replace the valve, remove the back-end gasket. Pull and remove the water tube, and replace the Non-Retraction Valve. (Fig.23)



Note：Syringe is not supplied with the handpiece.
Fig.22

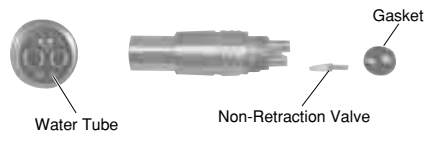


Fig.23

※ Specifications may be changed without notice.

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