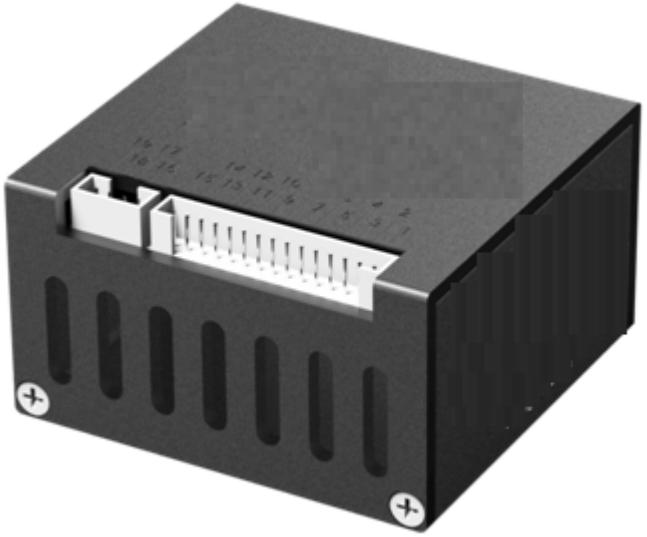
Flight Dental Systems

Ultrasonic Piezo Scaler Instruction Manual

Please read this manual before operating



Model: N6LED-1902

Version: 1.0

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1.0 Installation and Equipment Components

1.1 Instructions

Flight Dental Systems is a professional manufacturer of ultrasonic scalers. This product is mainly used for the removal of calculus, tartar build up and some root canal treatments. It is also essential for disease prevention and treatment.

1.2 Components

1.2.1 The components of the machine are listed in the packing list.

1.2.2 Components and Scope of Application
a) Ultrasonic scaler is composed of an electronic circuit, water flow control and ultrasonic transducer.
b) This model is used for dental calculus elimination and root canal treatment

1.3 Main Technical Specifications

1.3.1 Technical Specifications of the Ultrasonic Scaler

a) Power Input: Transformer: 24VAC 50Hz/60Hz 1.3A
b) Output Primary Tip Vibration: ≤ 100μm
c) Output Force: <2N
d) Output Tip Vibration Frequency: 28 kHz +/- 3kHz
e) Output Power: 3W to 20W
f) Water Pressure: 0.1 MPa to 0.5MPa (15-73PSI)

g) Weight of Main Unit: 0.2kg
h) Weight of Transformer: 1kg (optional)
i) Operating Mode: Continuous Operation
j) Type of Protection against Electric Shock: Class II
k) Degree of Protection Against Electric Shock: Type BF Applied Part
l) Applied Part of the Equipment: Handpiece and Tip
m) Degree of Protection against harmful ingress of water to the foot switch: IPX1
n) Degree of Safety of Application: Equipment should not be used in the presence of Flammable Anesthetic Mixture or with Oxygen or Nitrous Oxide

1.3.2 Working Condition

a) Environment Temperature: +5°C to +40°C
b) Relative Humidity: 30%~ 75%
c) Atmosphere Pressure: 70kPa to 106kPa
d) Temperature of Water at the Inlet: <+25°C

2.0 Installation

The Main components of this equipment are shown in Picture 1.

2.1 Connecting the power supply and air-electric switch (or *Optional Foot Pedal) shown in Picture 1.

2.1.2 Port No.2 and No. 3 should be connected to 24vAC. This circuit should not be used as an on/off switch.

2.1.3 Port No.4 and No.5 should be connected to the air electric switch or foot pedal directly. This circuit should not be bypassed with a jumper (short circuit).

2.2 Potentiometer Installation Instruction

2.2.1 Affix power adjustment potentiometer knob to the corresponding position on the delivery unit head so that the “10 and “1” are on opposite sides.

2.2.2 Insert the washer into the potentiometer, and insert the potentiometer into the desired position on your delivery unit head according to the wiring.

2.2.3 Install the flat washer and nut onto the potentiometer and secure the potentiometer in position. Turn the potentiometer to the left.

2.2.4 Align the notched mark on the aluminum knob with the 1 on the power adjustment dial to insert the knob correctly.

2.3 Important Notes for Installation

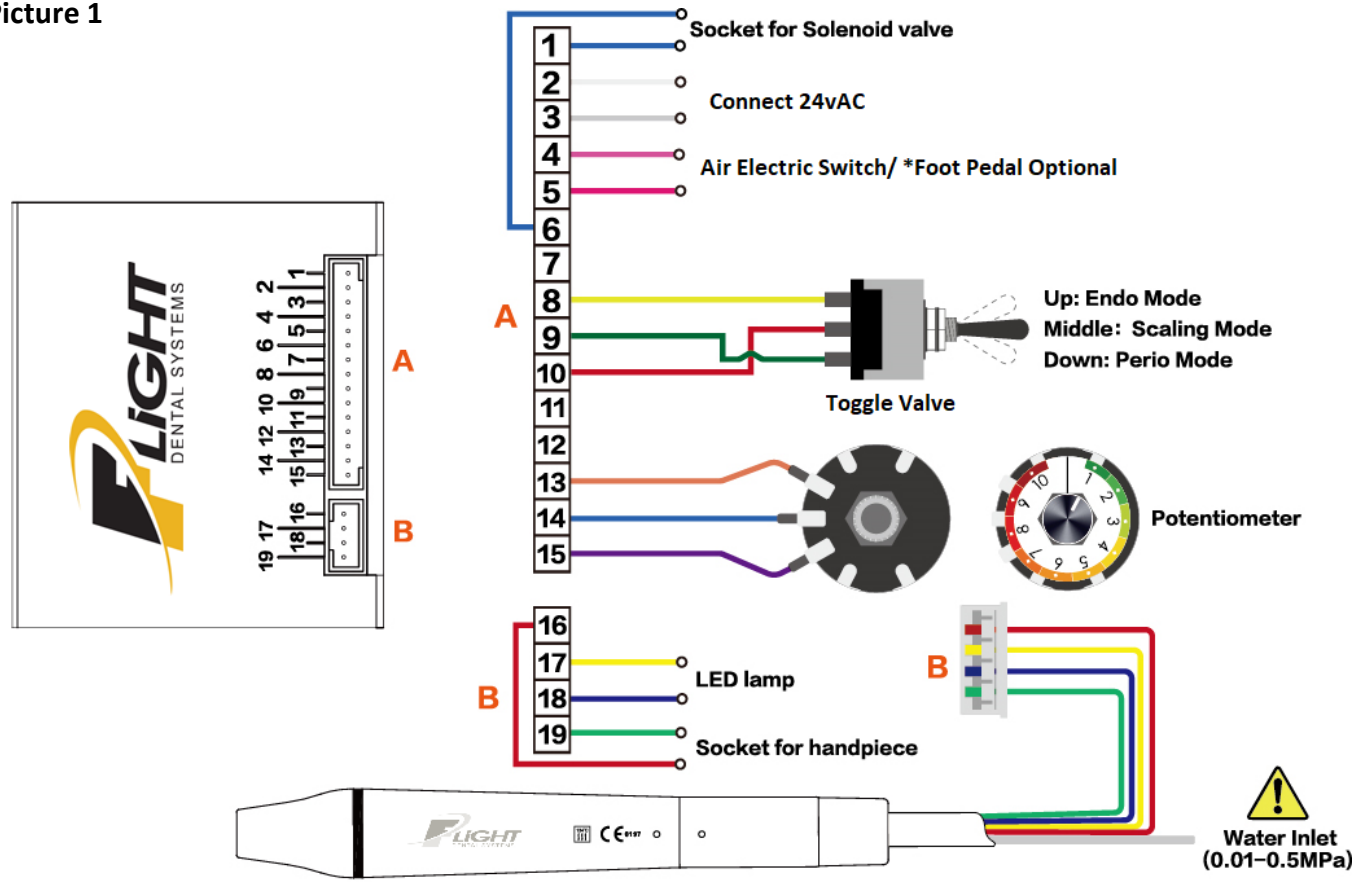
2.3.1 If an opening is not available for the scaler tubing you may need to drill a hole in your delivery unit head.

2.3.2 Leave enough space for the heat dispersion from your scaler module.

2.3.3 Before turning on the scaler, turn the potentiometer knob to the lowest setting and the water control to the maximum.

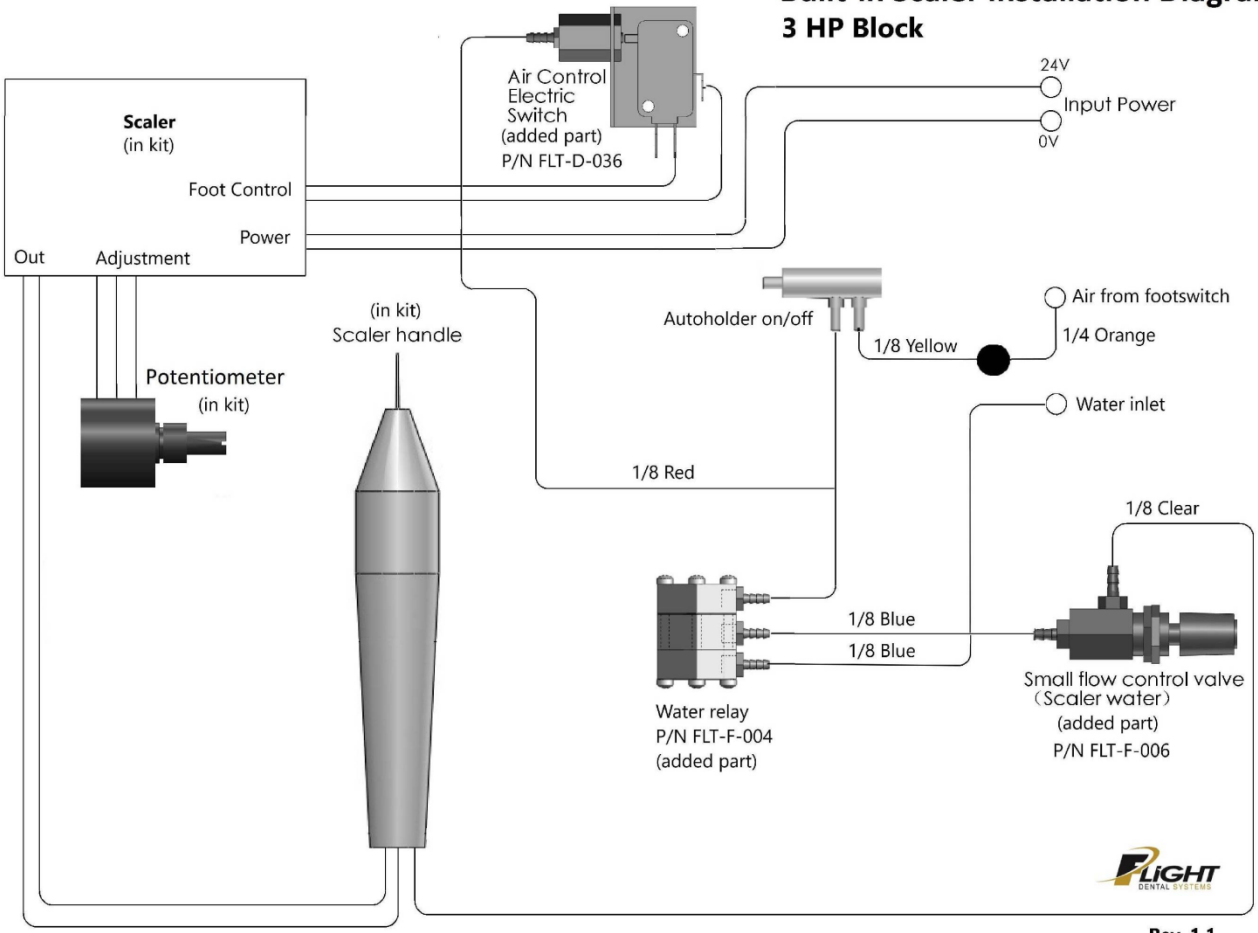
2.3.4 The frequency of the scaler is very high, there is no need to over-exert or leave scaler tip in one spot for a prolonged period of time while in use.

Picture 1



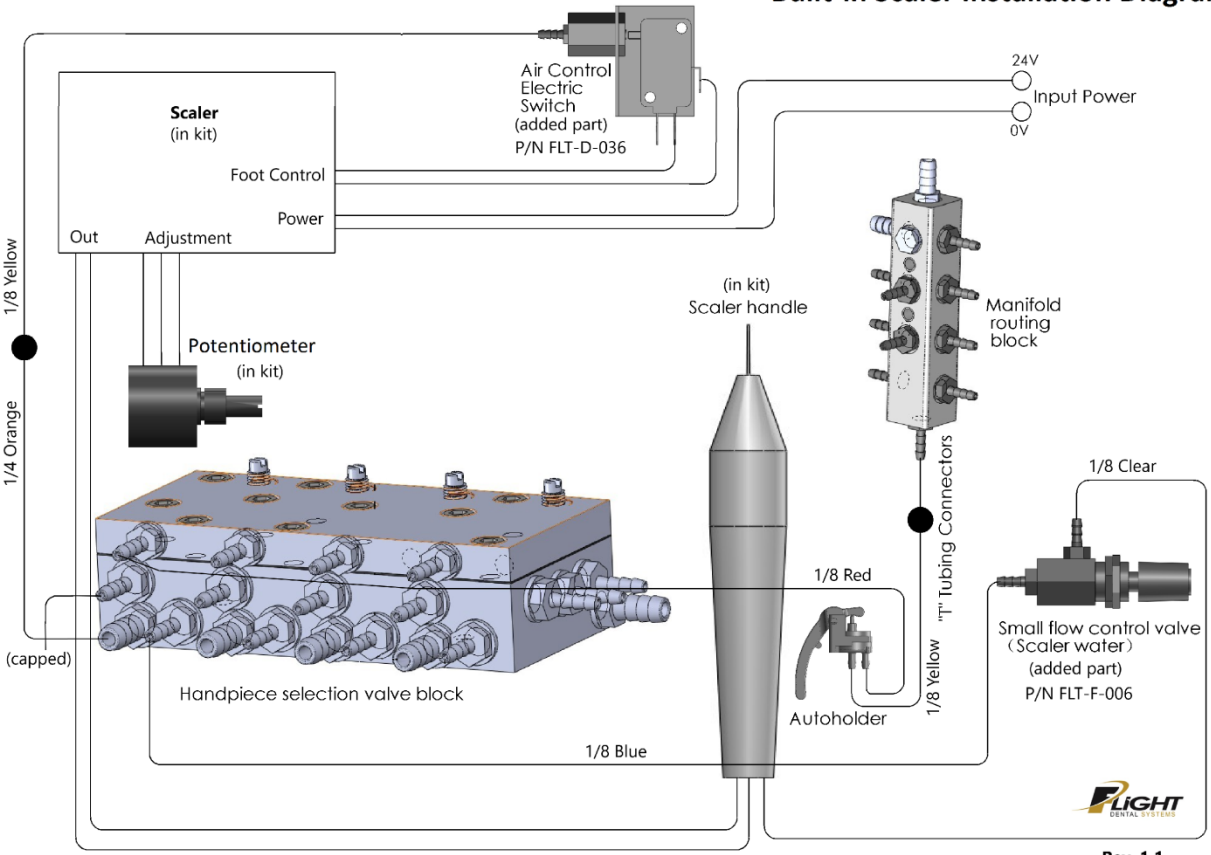
Notice: For device without Endo function, there is no toggle valve

Built-in Scaler Installation Diagram
3 HP Block



Rev. 1.1

Built-in Scaler Installation Diagram

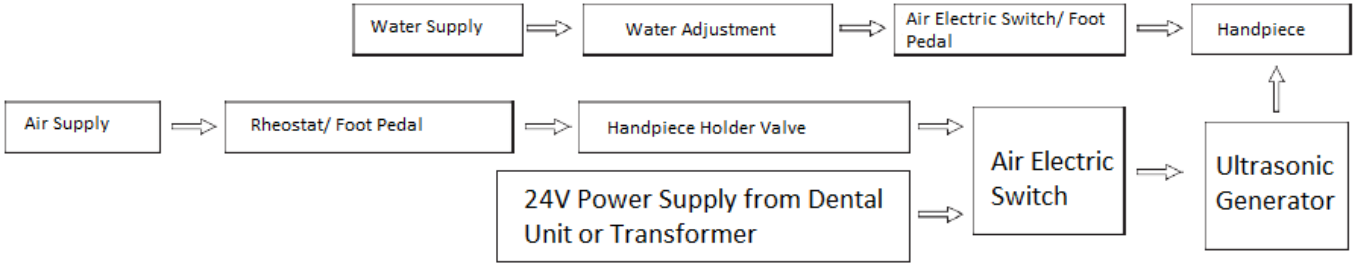


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3.0 Product Function and Usage

3.1 Working Principle

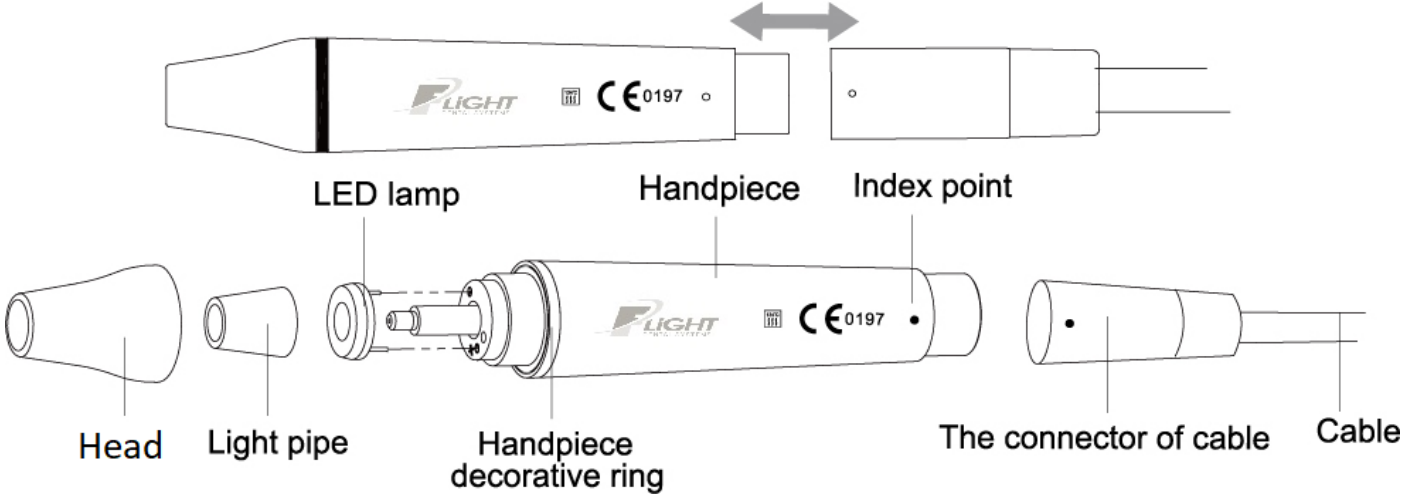
3.1.1 Summary: The built-in ultrasonic scaler consists of an ultrasonic generator (circuit board module), handpiece tubing (cable), handpiece (energy transforming instrument), scaling tip, air electric switch (power on/off switch- controlled by rheostat or foot pedal), handpiece holder switch (scaler off when handpiece is in holder and on when handpiece is out of the holder)



Remove the scaler handpiece from the holder and step on the air rheostat or foot switch to activate the air supply to the unit head. As soon as the rheostat/foot switch is depressed air will be supplied to activate the air electric switch and water supply. Consequently, the handpiece will start to vibrate, LED Light will be illuminated and water will come out of the handpiece sheath.

3.2 Scaling Function

3.2.1 Instructions for Detachable Handpiece (Shown in Picture 2)

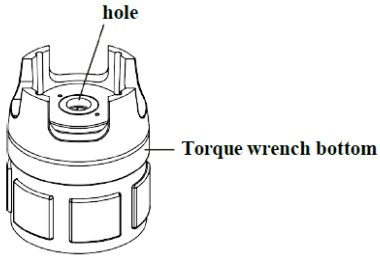


Picture 2

a) **Head:** The head can be removed. You can unscrew the head and clean the pole with alcohol lightly.
b) **Decorative Ring:** The decorative ring can be disassembled and cleaned with alcohol regularly and can be autoclaved.
c) **Handpiece:** The main part of the handpiece can be autoclaved
d) **Autoclave Symbol:** Autoclaved (134C, 0.22MPa)
e) **The Cable Connector:** The cable connector connects the handpiece with the water source and the main unit
f) **LED Lamp, Light Pipe:** Clean with purified water and sterilize with a temperature of 134C and pressure of 0.22Mpa

3.2.2 Instruction for Using Torque Wrench (Shown in Picture 3)

a) The torque wrench's structure is designed to assist with installing the scaler tip to the scaler handpiece head. It also guarantees that the operator can screw or unscrew the scaling tip effectively without risking injury to their hand.

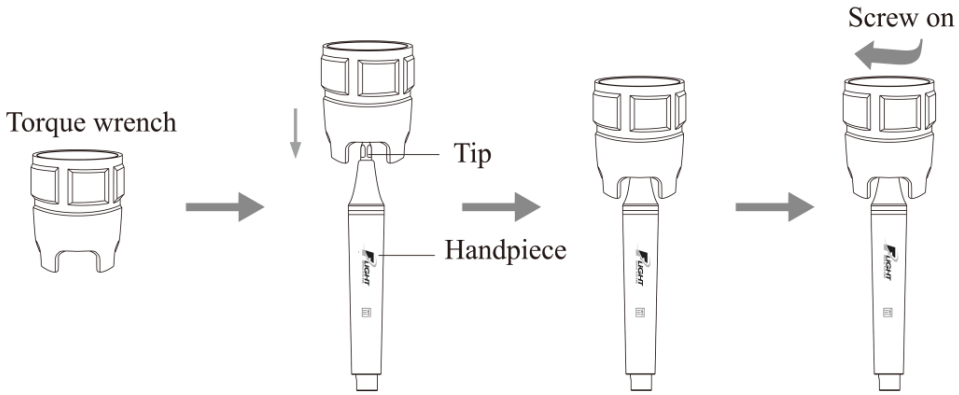


Picture 3

b) **Operation**:
   i) Insert the scaler tip into the torque wrench as shown in Picture 4

c) **Installation:** Hold the handpiece and turn the tip clockwise with the torque wrench. Do not over tighten the scaler tip.

d) **Un-installation:** Hold the handpiece and turn the wrench in a counter-clockwise direction to loosen

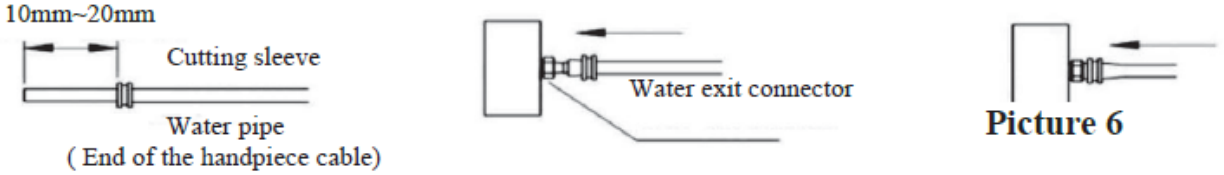


Picture 4

3.2.3 Cutting Sleeve Using the Instruction as show in Picture 6.

a) Put the cutting sleeve through the water sleeve and water pipe, keeping it 10mm to 20mm away from the opening.
b) Put the water pipe in the middle of the water opening (about 3mm), then push the cutting sleeve forward to the front edge of the water connector. Pinch the cutting sleeve and the water pipe with your fingers, push them forward at the same time until they are wrapped into the water connector fully. Then the cutting sleeve is in the middle of the water exit connector.

Note: Cut off 6mm of the front of the water pipe and repeat above operation



Picture 6

4.0 Sterilization and Maintenance

4.1 Sterilization of Detachable Handpiece

4.1.1 Autoclave the handpiece at 134C, 2.0-2.3bar (0.20 MPa ~ 0.23MPa) for the recommended duration according to the autoclave manufacturer.

4.1.2 Remove the handpiece sheath from the tubing and unscrew the tip after use.

4.1.3 Pack the handpiece sheath into the proper sterilization pouch and sterilize the handpiece sheath and tips accordingly.

4.1.4 The handpiece can be used again after it cools down.

4.1.5 **Note:**

a) Clean out any debris or fluids with compressed air before sterilization

b) Be sure to remove/unscrew the scaling tip before sterilizing each item. They cannot be sterilized together.

c) Please check if the outer part of the handpiece is damaged during the treatment and sterilization. Don't use any protective oil on the surface of the handpiece.

d) There are two o-rings at the end of the handpiece. Please lubricate them with dental lube (silicone lube) frequently, as sterilization and repeated, pulling and inserting will reduce their service life. Change the o-rings with a new one if it is damaged or worn excessively.

e) The following sterilizing methods should not be used:

1) Submerging handpiece in boiling water
2) Dipping the handpiece in disinfectants such as iodine, alcohol or glutaraldehyde.
3) Placing the handpiece into an oven or microwave oven

Note: Damage caused by above methods will void all warranties.

4.2 Sterilization of Scaling Tips

All the scaling tips can be cleaned with alcohol or disinfectant wipe. It's also okay to clean with an ultrasonic cleaner. Sterilization of scaling tips with high heat is recommended.

4.3 Sterilization of Torque Wrench

The torque wrench can be sterilized by neutral non-corrosive disinfectant for cleaning and sterilizing, or can be sterilized in an autoclave.

4.3.2 The following sterilizing methods should not be used:

a) Boiling in Liquid

b) Dipping in iodine, alcohol or glutaraldehyde

c) Using an oven or microwave oven

Note: Damage caused by above methods will void all warranties.

4.4 Cleaning of Tips, Torque wrench

The scaling tip, torque wrench can be cleaned with an ultrasonic cleaner.

4.5 Sterilization and Cleaning of LED Lamp and Light Pipe

Clean the LED lamp and light pipe with purified water. Sterilize them with an autoclave after every operation.

5.0 Cautions

5.1 Do not use this equipment on a patient with hemophilia

5.2 Do not use this equipment if you or patient has a pacemaker

5.3 Caution should be exercised when using this equipment on a patient with heart disease or on children or pregnant women.

6.0 Troubleshooting

Fault	Possible causes	Solutions
The scaling tip doesn't vibrate when stepping on the foot switch.	The plug is loose or has a bad contact.	Connect as shown in picture 1.
	Handpiece and the cable not connected properly .	Pull out handpiece and insert it again.
	Scaling tip is loose.	Screw scaling tip on tightly with the torque wrench.
	There is some water between the handpiece and the cable connector.	Dry the connection point.
	The handpiece is defective.	Replace the handpiece.
The scaling tip vibrates, but there is no water flowing out.	Water supply of the dental unit is turned off.	Check the water supply of the dental unit. Turn it on.
	There is no water coming out from the cable.	Clean the water pipe of the cable with a syringe.
	There is no water coming out from the handpiece.	Clean the water pipe of the handpiece with a syringe.
The handpiece generates too much heat.	The water flow is too low.	Turn the water control a little higher.
The amount of spraying water is too little.	The water pipe of the dental unit is clogged	Clean the water pipe.
	The water pipe of the cable is clogged	Clean the water pipe of the cable with a syringe.
	The water pipe of the handpiece is clogged	Clean the water pipe of the handpiece with a syringe.

	The water pressure is not high enough.	Increase the water pressure.
The vibration of the tip becomes weak.	The scaling tip hasn't been screwed tightly.	Screw down the scaling tip.
	The tip vibrated loose.	Screw down the scaling tip.
	The tip is damaged.	Change it with a new one.
There is water seeping from the coupling between the handpiece and cable.	The "O" ring is damaged.	Change it with a new "O" ring.

LED light doesn't work	Poor contact	Check the contacts.
	LED light is defective.	Replace it.
	LED lamp installed backwards.	Check that the LED lamp polarity is correct.
There is noise coming from the endochuck. (if there is an endochuck)	The screw cap hasn't been screwed tightly.	Tighten it.
The potentiometer is not working.	The potentiometer is defective.	Replace it with a new one.
The U-file doesn't vibrate. (If there is U-file)	The screw hasn't been tightened.	Tighten it.
	Endochuck is damaged.	Change it with a new endochuck.

If the problem persists please contact your authorized local distributor.

7.0 Precaution

Notice when using equipment

7.1 Keep the scaler clean before and after operation

7.2 The handpiece, scaling tip, torque wrench must be sterilized before each treatment.

7.3 Don't screw or unscrew the scaling tip when stepping on the foot pedal.

7.4 The scaling tip must be tight and there must be a fine spray or drip coming from the tip when operating.

7.5 Change tip to a new one when the tip is damaged or worn excessively. Don't twist or rub the tip.

7.6 The scaler tip will heat up if there is no water flowing while in use. Please keep a constant water flow.

7.7 Only use a pure water (Distilled or city water) source and no a saline solution

7.8 Ensure the handpiece connector and the cable sockets are dry before installing the handpiece

7.9 Don't pull the cable forcibly to avoid damage to the cable and wiring.

7.10 The internal screw thread of the scaling tips produced by other manufacturers may not be compatible. This will damage the thread of the handpiece if they are not compatible. Please use only "Flight" brand scaling tips.

7.11 Before connecting the built-in ultrasonic scaler (without transformer) to a power supply, check that the output voltage is 24V. If the scaler is connected to the wrong voltage, it will damage the unit.

7.12 End-users are not allowed to disconnect the built-in ultrasonic scaler. If you have any special request, please contact us.

WARNING: No modification of this equipment of allowed or warranties will be void.

8.0 Storage and Maintenance

8.1 The equipment should be handled with care. Be sure to install and keep in a cool, dry and ventilated place.

8.2 Don't store the device together with combustible, poisonous, caustic or explosive items

8.3 This equipment should be stored in a room where the relative humidity is 10%~93%, atmospheric pressure is 70kPa to 106 kPa, and the temperature is -20°C ~ +55°C.

8.4 Please turn off the electrical source if it is not used for a long time. Please ensure that the machine gets power and water once per month for five minutes.

9.0 Transportation

9.1 Excessive vibration should be prevented during transportation. Lay it carefully and lightly and do not invert.

9.2 Do not ship with dangerous goods.

9.3 Avoid direct sunlight, rain and snow during transportation.

10.0 After-Sale Service

The warranty is 1 year. Repairs should be performed only by an authorized technician. Repairs by unauthorized persons will void warranty.

11.0 Environmental Protection

Please dispose product according to your local laws.

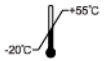
12.0 North American Authorization Representative

21 Kenview Dr, Unit 11
Brampton, ON Canada L6T 5G7
L6T 5G7

13.0 Manufacturer's Right

We reserve the right to change the design of the equipment, techniques, fittings, instruction manual and the contents of the original packing list at any time without notice.

14.0 Symbols

	Trademark		Consult the Accompanying Documents
	Consult the accompanying Documents	IPX0	Ordinary Equipment
	Alternating Current		Atmospheric Pressure for Storage
	Date of Manufacture		Manufacturer
	Class II Equipment		Type BF Applied Part
	Autoclavable		Use Indoor Only
	Appliance Compliance WEEE Directive	CE 0197	CE Marked Product
	Humidity Limitation for Storage		Temperature Limitation for Storage

15.0 EMC – Declaration of Conformity

The model N6LED-1902are intended for use in the electromagnetic environment specified below. The user of the model N6LED-1902should assure that it is used in such an environment.			
Emissions test	Compliance	Electromagnetic environment - guidance	
RF emissions CISPR 11	Group 1	The model N6LED-1902use RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.	
RF emissions CISPR11	Class B	The model N6LED-1902are suitable for used in domestic establishment and in establishment directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.	
Harmonic emissions IEC 61000-3-2	Class A		
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies		
Guidance & Declaration — electromagnetic immunity			
The model N6LED-1902is intended for use in the electromagnetic environment specified below. The user of the model N6LED-1902should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines ±1 kV for Input/output lines	±2kV for power supply lines ±1kV for interconnecting cable	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to earth	±1 kV line to line	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on	<5 % UT (>95% dip in UT.) for 0.5	<5 % UT (>95% dip in UT.) for	Mains power quality should be that of a typical commercial or hospital environment. If the user of the models N6LED-1902require continued operation during power mains interruptions, it is recommended that

power supply input lines IEC 61000-4-11.	cycle 40 % UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95 % dip in UT) for 5 sec	0.5 cycle 40 % UT (60% dip in UT) for 5 cycles 70% UT (30% dip in UT) for 25 cycles <5% UT (>95 % dip in UT) for 5 sec	the models N6LED-1902be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field lEC 61000-4-8	30A/m	30A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE U_T is the a.c. mains voltage prior to application of the test level.			
The models N6LED-1902 are intended for use in the electromagnetic environment specified below. The user of the model N6LED-1902 should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**

Conducted RF lEC 61000-4-6 Radiated RF lEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands 3 V/m 80 MHz to 2.7 GHz 385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014)	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands 3 V/m 80 MHz to 2.7 GHz 385MHz-5785MHz Test specification s for ENCLOSUR E PORT IMMUNITY to RF wireless communicati on equipment (Refer to table 9 of IEC 60601-1-2:2014)	Portable and mobile RF communications equipment should be used no closer to any part of the models N6LED-1902, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d=[3,5/V1]\times P^{1/2}$ $d=1.2\times P^{1/2}$ 80 MHz to 800 MHz $d=2.3\times P^{1/2}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter In watts (W) according to the transmitter manufacturer and d Is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur In the vicinity of equipment marked with the following symbol:
NOTE 1: At 80 MHz end 800 MHz. the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the models N6LED-1902 are used exceeds the applicable RF compliance level above, the model N6LED-1902 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the models UDS-N6 LED. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.			

SCAN ME

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