LM

feel the difference

LMProPower

CombiLED

USER MANUAL

DVD/CD-R

This manual is valid for:

LM-ProPower 1007274
LM-ProPower 1007375
LM-ProPower 1007274us
LM-ProPower 1007375us
LM-ProPower 1007274jp
LM-ProPower 1007375jp

Important!

Read this manual carefully
before using the product.

How to read this manual

Each chapter starts with a section with general instructions, which is followed by sections with additional information. First read the general section and then proceed to the section that applies to your product.
If there are any questions regarding the contents of this manual, please contact LM-Instruments Oy.

Manufacturer, Marketing and Sales

LM-Instruments Oy
PL 88 (Norrbyn rantatie 8)
FI-21601 Parainen. Finland
Telephone: +358 2 4546 400
Fax: +358 2 4546 444
E-mail: info@lminstruments.com
Internet: www.lminstruments.com

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Printed in Sweden, January 2010.

CE 0537

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Safety

Intended use

This combined UltraLED scaler and AirLED polisher unit is designed for dental purposes. It is designed for removal of tartar or calculus on teeth, cleaning discoloured teeth and other dental work where the ultrasonic vibration and/or air polishing is beneficial. The unit should only be used by licensed dental proffesionals trained in the proper use of scaling- and polishing devices. Do not use it for applications where it is not intended. If you are unsure about your application, please contact your local dealer or place of purchase.

General requirements

Installation and service of the product is only to be performed by authorized service personnel.
The product must be connected to electricity-, water- and compressed air supply meeting the requirements specified in the **Technical data** section on page 30.
The product needs special precautions regarding EMC (Elektro Magnetic Compability) and needs to be installed and put into service according to the EMC information provided on page 34.
Portable and mobile RF (Radio Frequency) communications equipment can affect the product.

Contraindications

Do not use the scaler on patients with cardiac pacemakers. The scaler may disturb the function of the pacemaker.

General precautions

- The product is not suitable for use in the presence of flammable gases.
- Only use the product in combination with LM-Instruments and Amdent scaler tips.
- If the handpiece tubing is damaged or worn-out, it must immediately be replaced to avoid exposing the user or the patient to electric hazard.
- Use the original packaging when returning equipment for service.

Warnings

The product should not be used adjacent to or stacked with other equipment.
If adjacent or stacked use is necessary, the product should be observed to verify normal operation in the configuration in which it will be used.

Safety notices in this manual

WARNING

Warning indicates a potentially dangerous situation. Non-observance may lead to death or injury.

Caution

Caution indicates a potentially harmful situation. Non-observance may damage the equipment.

Note

Note indicates a situation where special notice should be observed.

Consigne de sécurité (Canada)

Utilisation prévue

Ce générateur d'ultrasons piézo électrique combine à un aéropolisseur est conçu pour des buts dentaires. Il est conçu pour l'élimination du tartre sur les dents, le nettoyage des dents décolorés et tout autre travail dentaire où la vibration ultrasonique est salutaire. Le produit doit être employé seulement par les professionnels dentaires autorisés qualifiés dans l'utilisation appropriée des détartreurs et polisseurs.
N'utilisez pas l'appareil pour des applications où on ne le destine pas. Si vous êtes incertain au sujet de votre application, veuillez bien contacter votre distributeur local et/ou où vous l'avez acheté.

Conditions générales

L'installation et le service du produit doit être executé seulement par le personnel de service autorisé avec les outils et le matériel appropriés. Le produit doit être relié à l'approvisionnement de l'électricité et à l'approvisionnement en eau et en air comprimé répondant aux exigences définies dans la section **Caractéristiques techniques** à la page 30.
Le produit exige des précautions spéciales concernant la CEM (Compatibilité Electromagnétique) et doit être installé et mis en service selon à la page 34. L'équipement de communication RF (Radio Fréquence) portable et mobile peut affecter le produit.

Contres-indication

N'employez pas sur des patients avec les stimulateurs cardiaques. Le produit peut déranger la fonction du stimulateur.

Précautions générales

- Le produit n'est pas approprié pour l'usage en présence d'un mélange anesthésique inflammable.
- Utilisez seulement le produit en combinaison avec des inserts de détartreur de LM-Instruments et Amdent.
- Si la tuyauterie de pièce à main est endommagée ou usée, elle doit immédiatement être substituée pour éviter d'exposer l'utilisateur ou le patient au risque électrique.
- Utilisez l'original empaquetage en renvoyant le matériel pour le service.

Avertissement

Le produit ne doit pas être utilisé à proximité ou empilé avec d'autres équipements. Si l'usage adjacent ou empilé est nécessaire, le produit doit être surveillé pour une utilisation normale suivant la configuration dans laquelle il sera utilisé.

Notifications de sûreté en ce manuel

WARNING

“Warning” indique une situation probablement dangereuse. La inobservance peut mener à la mort ou des dommages.

Caution

“Caution” indique une situation probablement nocive. La inobservance peut endommager le matériel.

Note

“Note” décrit si on observe la notification spéciale.

1 Unpacking

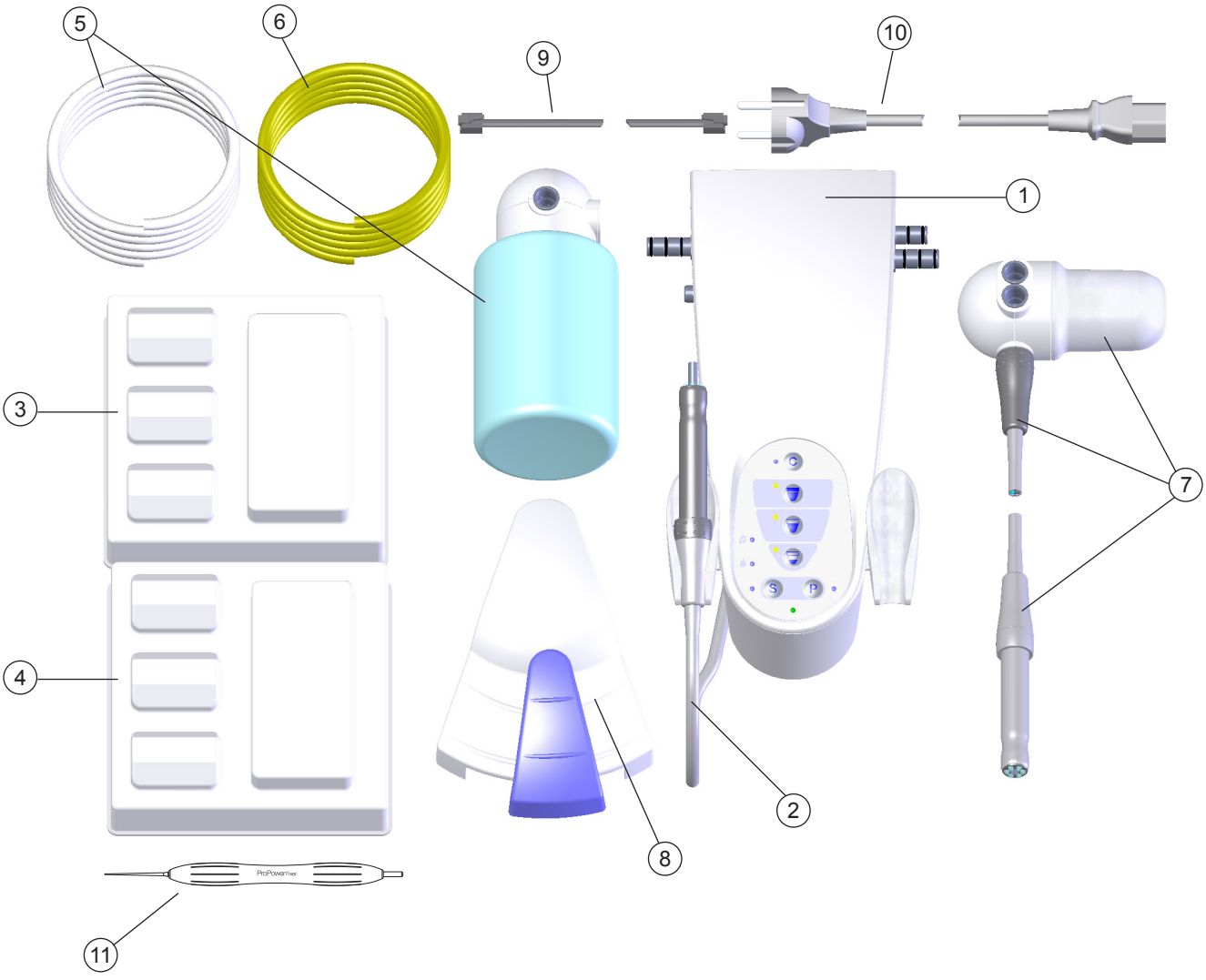
Note

This chapter describes the components of the delivery and can be used as a check list when unpacking. Contact your place of purchase if anything is missing. For a description of the features of the equipment, read the Equipment description section on page 11.

Carefully unpack your LM-ProPower CombiLED unit and verify that all accessories and components are included according to the content lists below:

1.1 General content of delivery

1. LM-ProPower CombiLED unit
2. Scaler handpiece connected to unit
3. Scaler introkit (see section 1.2)
4. Polisher introkit (see section 1.2)
5. 500 ml medicament bottle or water hose 1/4”
6. Air hose
7. Powder container + Polisher handpiece and tubing
8. ProPower foot control
9. Foot control cable
10. Power cord
11. LM-ProPower Fixer



1.2 Content of introkits

Content of UltraLED Scaler introkit

3 x Scaler tips
3 x ErgoGrips (2 x Light, 1 x Focus Light)
3 x Torque Wrenches
3 x Tip Check Cards

Content of AirLED Polisher introkit

2 x Polisher nozzles (universal and angeled)
2 x ErgoGrips (Light, Focus Light)
2 x Bottles 180 g polisher powder

Universal

Angeled

2 Equipment description

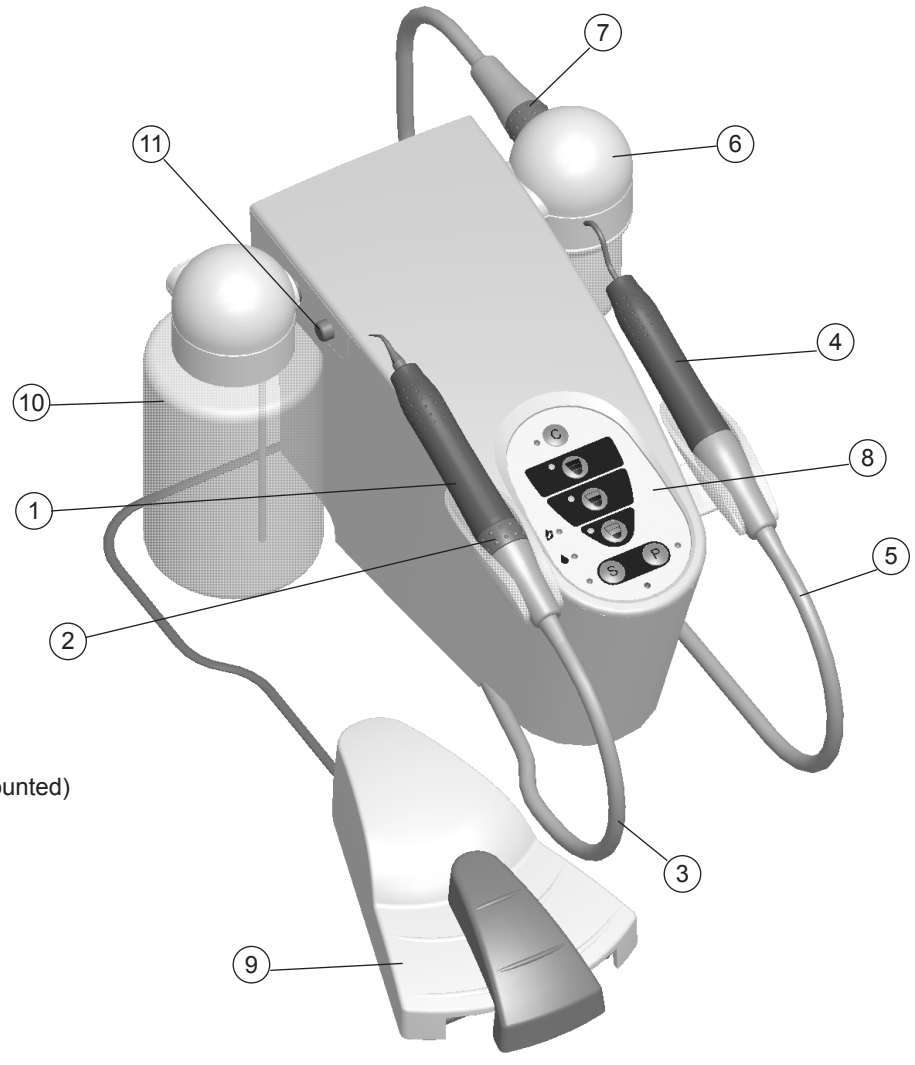
2.1 General description

LM-ProPower CombiLED combines an effective piezoelectric UltraLED scaler and an AirLED polisher in one versatile and ergonomic appliance.

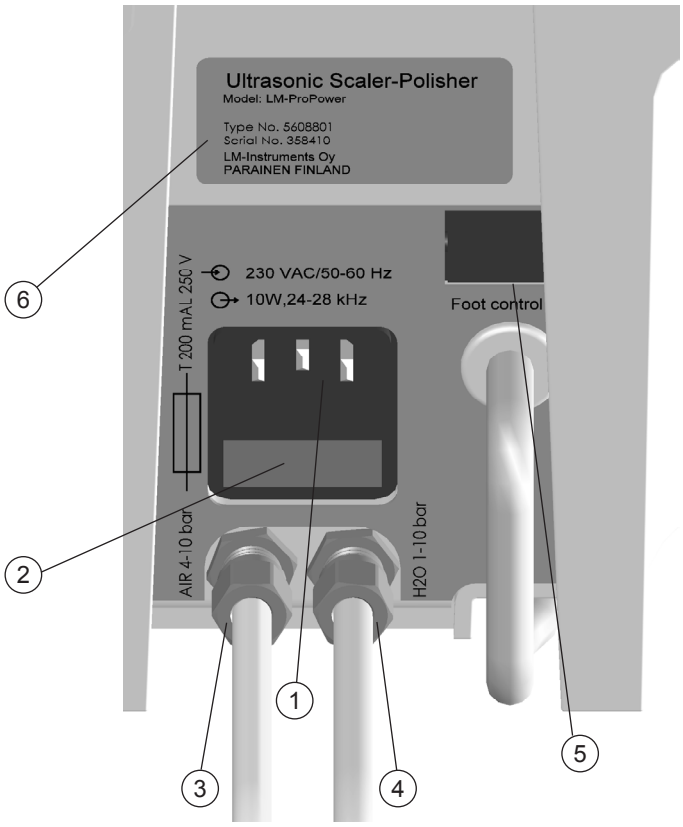
The device's impressive LED lights, most advanced electronics, quality, and high-durability LM-DuraGradeMAX tips enhance the execution of procedures which require great precision.

Ergonomically designed ErgoGrip handpieces with soft silicone handles give the user a comfortable, relaxed grip as well as an excellent feel.

LM-ProPower is highly adaptable to any procedure or user approach. It is not only an outstanding scaling and cleaning device, but it also brings power and versatility to endodontics, implantology, restorative treatments, minimally invasive treatments and apical surgery with ProPower SteriKit.

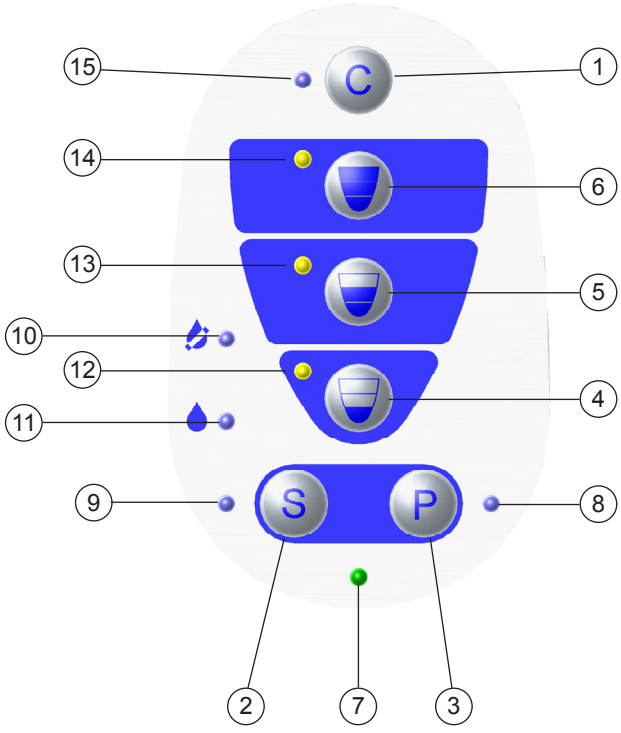


1. Scaler Handpiece (with an ErgoGrip and a tip mounted)
2. Scaler water flow control ring
3. Scaler handpiece tubing
4. Polisher handpiece (with an ErgoGrip and a nozzle mounted)
5. Polisher handpiece tubing
6. Powder container
7. Polisher water flow control ring
8. Control panel
9. ProPower foot control
10. Medicament bottle
11. Depressurisation button



1. AC power input
2. Fuse holder
3. Air hose coupling
4. Water hose coupling (optional)
5. Foot control connection
6. Type plate

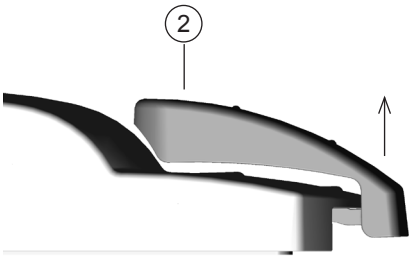
2.2 Control panel

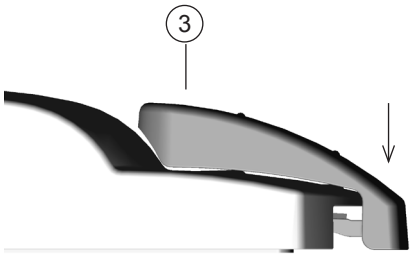


1. Cleaning key
2. Scaling mode key
3. Polishing mode key
4. Working mode 1 key
5. Working mode 2 key
6. Working mode 3 key
7. StandBy indicator
8. Polishing mode indicator
9. Scaling mode indicator
10. Dry mode indicator (scaler)
    Air-Blow mode indicator (polisher)
11. Irrigation mode indicator (scaler)
    Water-Jet mode indicator (polisher)
12. Working mode 1 indicator
13. Working mode 2 indicator
14. Working mode 3 indicator
15. Cleaning mode indicator

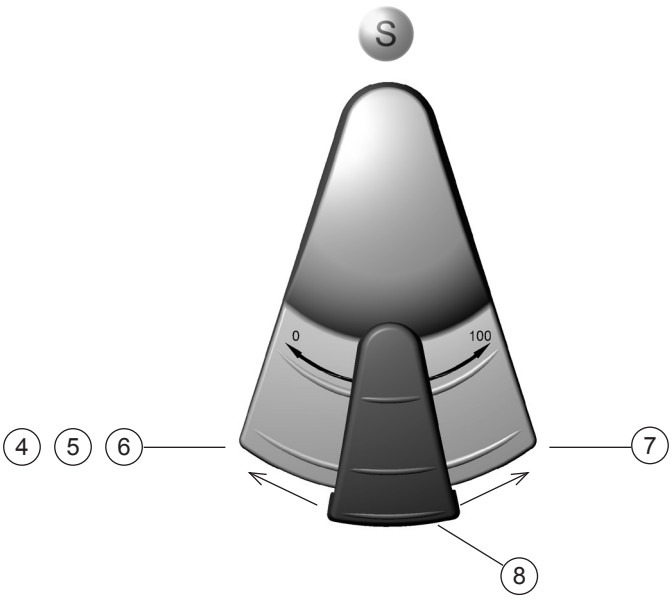
2.3 ProPower foot control

1. Connection for foot control cable
2. OFF position
3. ON position
4. Diagnostic function, turn LED light ON or OFF by a single-click on the pedal
5. Irrigation position (scaler)
6. Zero power position (scaler)
7. Maximum power position (scaler)
8. Power regulation (scaler)
9. Water Jet position (polisher)
10. Working mode 3 position if working mode 3 is chosen on control board, othterwise working mode 2 (polisher)
11. Working mode 2 position (polisher)

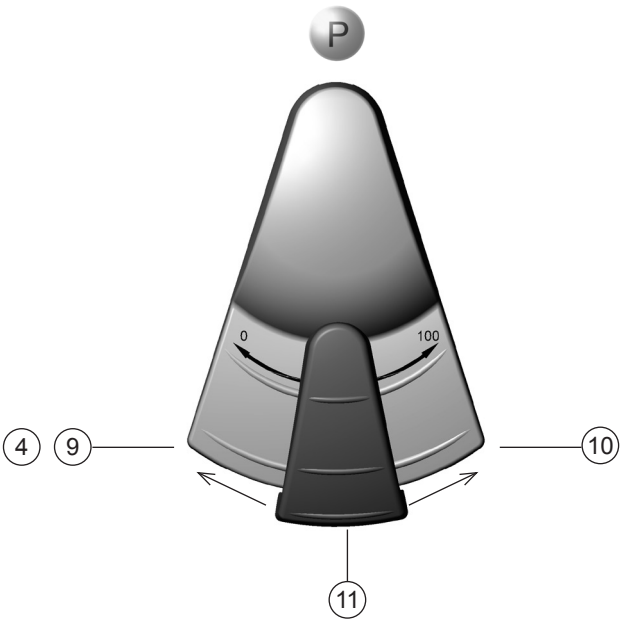




UltraLED Scaler



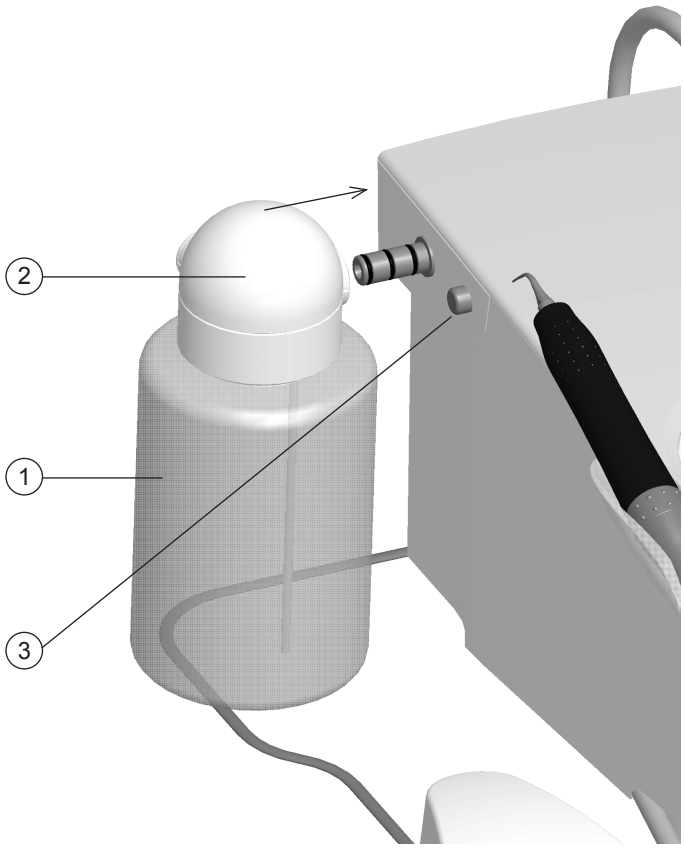
AirLED Polisher



2.4 Medicament bottle (optional)

LM-ProPower has a medicament dispenser system, making the device independent of a fixed water supply connection. The medicament bottle can be used for either medicament solutions or ordinary clean water.
The unit contains an electrically driven air compressor. When operating the unit the compressed air forces the fluid from the bottle through the hose and to the handpiece and the tip/nozzle.

1. Medicament bottle
2. Bottle connector
3. Depressurisation button



The LM-ProPower can be delivered either with the medicament dispenser system or with fixed water supply connection without the bottle and bottle connector.

2.5 Symbols on the equipment

Working mode 1

Working mode 2

Working mode 3

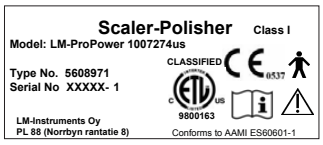
Irrigation/Water-Jet mode

Dry/Air-Blow mode

Automatic cleaning function

Scaling function

Polisher function



Example of type plate. The type plate is placed on the back side of the scaler unit.

Medical electrical equipment classified by ETL with respect to electric shock, fire, mechanical, and other specified hazards in accordance with the Safety Standards ANSI/AAMI ES 60601-1 and CAN/CSA C22.2 No 60601-1:08

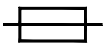
Caution

Consult accompanying documents.

Compliance label indicating compliance with the Medical Device Directive 93/42/EEC.
0537 is the ID-number of the Notified Body: VTT

Withstands autoclave temperature 135°C (275°F).

Type B applied part according to the degree of protection against electrical shock.



Fuse

Input

Output

Please do not throw the equipment into the domestic refuse. Please use the return and collection systems available in your country for the disposal of this product. The equipment can also be returned to the manufacturer for disposal.

3 Installation

3.1 General installation instructions

Checklist

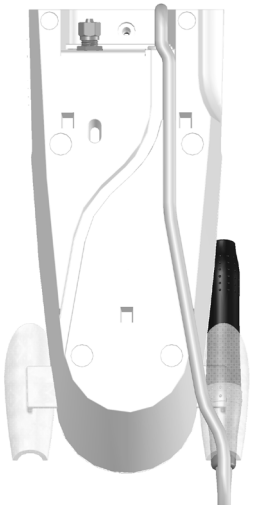
- Position the unit horizontally with the handpieces in the holders and the hoses hanging free.
- Position the unit where air is free to circulate on all sides and beneath it. Do not position the unit on a wall or next to a heat source.
- Avoid placing the unit in the immediate vicinity of sources of electromagnetic radiation, for example an electrosurgery equipment.
- Connect the foot control cable to the foot control and at the rear side of the unit.
- Mount the scaler tubing in the groove underneath the unit, as in picture.

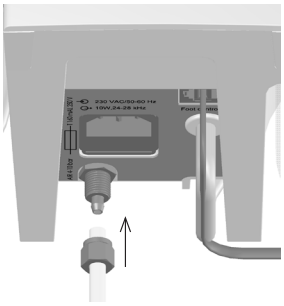
Caution

Do not place the unit on or next to a heat source. Excessive heat may damage the electronics.

Connecting to the air supply

1. Verify that the air supply can be turned off.
2. Verify that the air pressure conforms to the data in the Technical data section on page 30.
3. Use only dry and filtered com-pressed air.
4. Unscrew the nut from the nipple and thread it on the hose.
5. Push the hose onto the coupling nipple.





Caution

Consult a qualified technician for connecting the unit to the air supply. Use only dry and filtered compressed air.

6. Tighten the nut firmly and ensure that the hose is securely attached to the unit.
7. Connect the other end of the hose to the air supply.

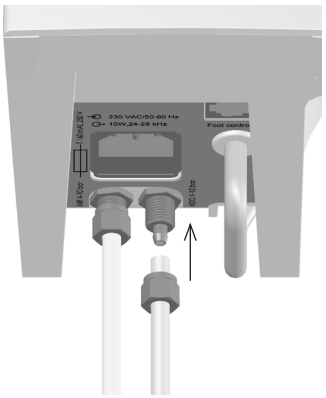
3.2 Version for tap water (optional)

Connecting to the water supply

Caution

Consult a qualified technician for connecting the scaler to the water supply.

1. Verify that the water supply can be turned off.
2. Verify that the water pressure conforms to the data in the Technical data section on page 30.
3. Verify that the water supply fulfills the medical demands of hygiene.
4. Unscrew the nut from the nipple and thread it on the hose.
5. Push the hose onto the coupling nipple.
6. Tighten the nut firmly and insure that the hose is securely attached to the unit.
7. Connect the other end of the hose to the water supply.



3.3 General installation instructions, continued

WARNING

The unit must be connected to an AC power outlet provided with a protective ground. USA and Canada: The power cord and plug must be classified as ”Hospital-Grade”.

- Verify that the voltage rating on the rear side match the voltage of the AC power outlet.
- Verify that the AC power outlet is provided with a protective ground.
- Connect the power cord to the unit and the AC power outlet. All indicator lamps will illuminate for a short period during a self check of the unit.
- The unit is standby when the green indicator lamp is illuminated.

4 Operating instructions

Preparations (bottle version)

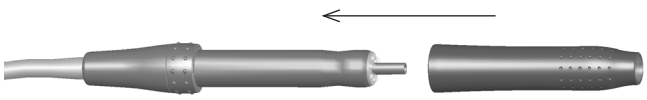
1. Fill the medicament bottle with water or medicament solution according to the Medicaments that can be used section on page 31.

2. Screw the bottle connector onto the bottle and push it onto the connector. See picture in section 2.4

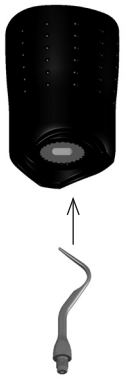
3. Check that the unit is connected to air supply, the power cord is connected and the unit is in stand-by mode, the green indicator lamp is illuminated.

4.1 UltraLED Scaler

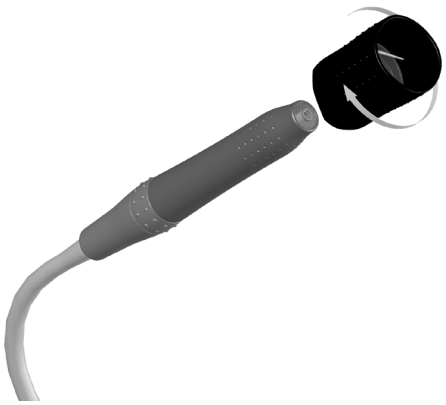
1. Gently slide the ErgoGrip on to the scaler handpiece.



2. Carefully place the tip in the torque wrench.



3. Use the torque wrench and screw the the tip clockwise on to the scaler handpiece. Tighten until resistance and the torque wrench slides. The torque wrench prevents the tip from being overtightened.



WARNING

A tip that is bent, altered, worn more than 2 mm will loose performance and must be exchanged. Prolonged use may cause tip breakage and injury to the patient.

The operator should be aware of that ultrasonic instruments with small diameters are subject to breakage at any time. If not used correctly or with too much power or force the instrument WILL break.

Do not use nickel-titanium files, since they easily break at high frequenses.

Caution

Without cooling fluid, the maximum operating time, for the scaler handpiece, is 2 minutes followed by a cooling-down period of 8 minutes. Operating without cooling fluid for more than 2 minutes may cause overheating of the scaler handpiece.
After above cycle has been repeated 2 times, the scaler handpiece has to cool down for at least 60 minutes.

WARNING

Remember to choose the right working mode if changing scaler tip during the treatment

New tips are not sterile upon delivery. Sterilize before use according to the clinic's routines.

Keep the patient's lips, cheeks, and tongue out of the way of the activated tip, since contact may cause burns because of friction heat.

Note

At low power settings there will be no spray.

Increase the water flow if the handpiece feels too warm.

4. Turn on the UltraLED scaler by pressing the key marked S on the keyboard. The blue scaling indicator lamp illuminates and the scaling mode is activated.

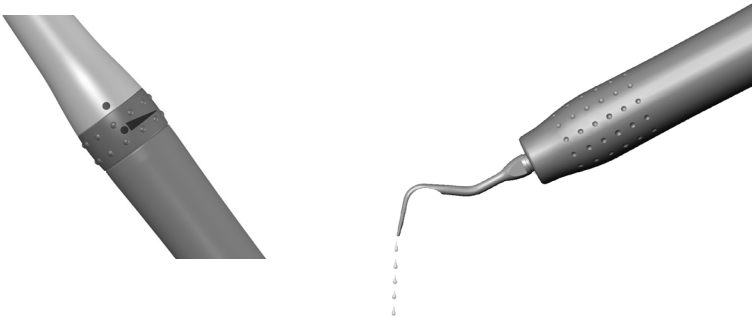
5. Check the recommended working mode that is marked on the tip and choose the working mode by pressing the corresponding working mode key on the keyboard.

6. A second press of the "S" key activates the dry mode for scaling without water/medicament.

7. A third press of the "S" key activates the irrigation mode. The irrigation mode can also be activated in the scaling mode by pressing down the foot control in the leftmost position.

8. By pressing the "S" key repeatedly, it will toggle between normal scaling, dry and irrigation mode.

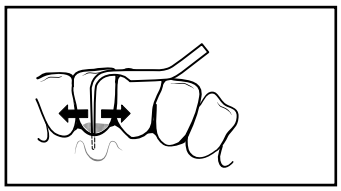
9. Keep the handpiece over the bowl and depress the foot control in the leftmost position and adjust the water flow with the ring on the handpiece until the water is dripping from handpiece as in picture below. Recommended flow: 20 ml/min.



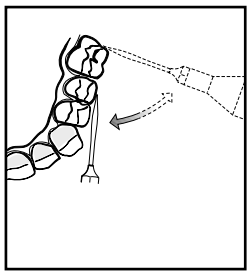
10. Keep the patient's lips, cheeks and tongue out of the way of the tip and perform treatment according to "How to use the scaler" section on next page.

How to use the UltraLED scaler

The side of the tip-end shall be applied to the tooth so that the movement of the tip is parallel to the surface of the tooth. The first 2 mm of the tip are the most efficient! Place the tip on the tooth surface before activating the foot control. The power is regulated with the foot control from 0 to 100% within each working mode.
Normal scaling rarely requires more than 50% power level of each working mode. However, hard to remove calculus might require a higher power setting.



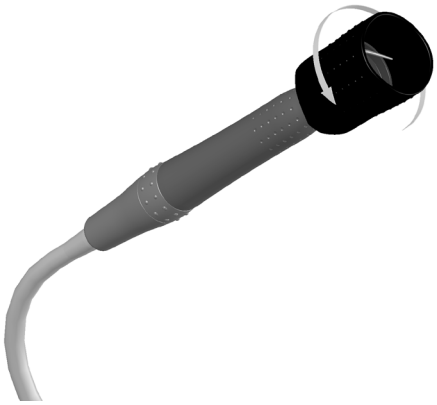
Ensure that contact between the tip and the tooth surface is maintained during scaling. Keep moving the tip slowly back and forth and let the instrument do the work. Use short and long strokes so that the whole surface of each tooth is scaled.
The tip is normally aimed towards the toothpocket.



To keep the tip working parallel to the surface of each tooth, it is important to follow the anatomy of the tooth.
With the correct power setting, appropriate pressure against the tooth (approximately 20 grams but not exceeding 50) and the tip operating parallel to the surface, treatment will be gentle, quiet and efficient.
If, during the treatment, a squeaking sound is heard (loud and dominating), the pressure against the tooth might be too low or the tip not parallel to the surface of the tooth.

After scaler treatment

1. Run the Automatic cleaning function, see instructions on page 25.
2. After the cleaning cycle is finished, screw off the tip, counter clockwise, with the torque wrench.



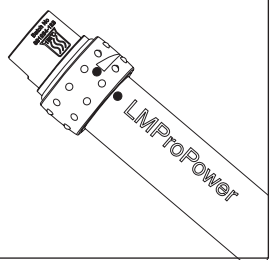
Note

Always set the water flow to fully open before running the cleaning cycle (dots in line, see picture).

3. Squeeze the ErgoGrip gently at the top and at the same time slide it off the handpiece. Do not squeeze too hard at the ErgoGrip as this can make the removal difficult.
4. Press the depressurization button.
5. Pull the medicament bottle from the unit (bottle version).
6. Clean and sterilize the equipment/components according to the Cleaning and maintenance section on page 25-26.

Caution

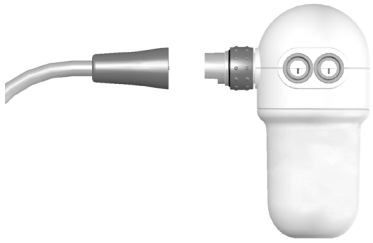
Before cleaning and sterilizing; the handpiece water control ring must be set to fully open (dots in line, see picture)



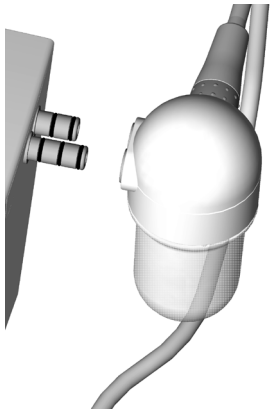
4.2 AirLED Polisher

1. Unscrew the powder container from the cap and fill the powder container with LM-ProPower powder up to MAX.

2. Screw the container back on to the cap and connect the tubing to the cap.



3. Connect the powder container cap to the connectors on the right side of the unit.



4. Connect the medicament bottle to the unit, see instruction section 2.4 (bottle version).

Note

Only use original LM-ProPower air polishing powder.

Caution

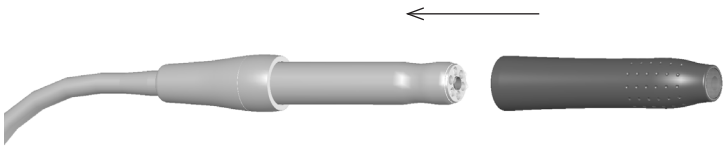
It is important, that the powder container is fully tightened before the polisher is activated.

Do not leave powder in the powder container over the night.

Caution

It is very important, that the polisher not is activated before the nozzle is mounted.

5. Gently slide the ErgoGrip on to the polisher handpiece.



6. Insert the polisher nozzle into the handpiece until the bottom.

WARNING

When inserting the nozzle it is important to push it in until the bottom is reached.

7. Turn on the polisher on by pressing the button marked P on the front side of the scaler. The blue polisher indicator lamp illuminates.
8. Choose working mode 2 or 3 by pressing the corresponding working mode key on the keyboard (see note).
9. A second press of the “P” key activates the Air-blow mode for cleaning with just air.
10. A third press of the “P” key activates the Water-Jet cleaning mode. No powder, but only water and air, comes out from the nozzle. The Water-Jet mode can also be activated in the scaling mode by pressing down the foot control in the leftmost position.
11. By pressing the “P” key repeatedly, it will toggle between normal polishing-, Air-blow- and Water-Jet mode.
12. Point the handpiece towards the cuspidor and over the bowl. Depress the foot switch to activate the polisher and adjust the water flow with the ring on the powder container, see equipment description.
13. Hold the polisher nozzle approximately 1 cm (0,4 in.) downright from the bottom of the bowl and press the foot control to activate the polisher.
14. Slowly reduce the water flow until the powder starts to accumulate on the surface as a white spot.
15. Increase the water flow until the spot just disappears. The air polisher is now balanced for optimum performance.
16. Perform polishing treatment according to “How to use the polisher” section on next page.

Note

For the polisher only working mode 2 and 3 can be activated.
Working mode 2 is aprox. 60% of polishing power compared to working mode 3 (100%).
Working mode 1 can not be activated.

Caution

It is very important to air purge the polisher handpiece after each treatment to prevent clogging.

Water-Jet cleaning

With the foot control pressed down in the leftmost position the “Water-jet” cleaning mode is activated and no powder, but only water and air, comes out from the nozzle.

Polishing power

The polishing power is regulated with the foot control from:
Left/ZERO = WaterJet (only water and air)
Middle = **60%**
Right/MAX = **60 or 100%,** depending on which working mode that is chosen on the control panel.

Air purge quick cleaning function

With the polisher mode active, a press on the C button will air purge the handpiece for a few seconds. Air purge the handpiece after each treatment to prevent clogging.

How to use the AirLED polisher

Polishing is suitable for the following procedures:

- Efficient removal of heavy stains and dental plaque.
- Cleaning teeth prior to bleaching.
- Cleaning pits and fissures prior to sealant placement.
- Surface cleaning prior to any acid etch or bonding procedure.
- Cleaning orthodontically banded or bracketed teeth.
- Cleaning of implants.

1. Protective eyewear should be worn by the patient and operator. Contact lenses should not be worn, or a close fitting eye shield should be provided.
2. The jet should be kept constantly moving in small circles. It should not be directed at the same spot too long. The nozzle shall be held approximately 3 mm (0,12 in.) from the surface.
3. The polisher will be most effective when directing the jet downright towards the tooth although the spray should be directed away from the gingiva onto the tooth.
4. Only one or two teeth should be polished at a time, with frequent rinsing performed. An efficient intraoral evacuation system will prevent excessive build-up of fluid and increase patient comfort.
   A short learning period is required by the operator, as with any new technique, until the ideal angulations, soft tissue protection and an effective treatment can be achieved.

After polisher treatment

1. Without removing the nozzle, place the polisher handpiece over the bowl and press the cleaning key “C”.
2. The polisher air purges the handpiece for a few seconds.
3. After the cleaning cycle is finished, remove the nozzle by pulling it out from the handpiece.
4. Wash the nozzle in an ultrasonic bath (40-50°C), for at least 3 minutes, before cleaning/sterilization. If ultrasonic cleaning not is possible, flush the nozzle in warm water.
5. Squeeze the ErgoGrip gently at the top and at the same time slide it off the handpiece. Do not squeeze too hard at the ErgoGrip as this can make the removal difficult.
6. Remove the powder container and polisher handpiece.
7. Before removing the medicament bottle, press the depressurization button.
8. Pull the medicament bottle from the unit.
9. Clean and sterilize the equipment/components according to the Cleaning and maintenance section on page 25-26.

WARNING

Polishing should NOT be performed on patients who:
- Are on a sodium restricted diet.
- Have renal insuffiency.
- Have chronic respiratory disease.
- Are on long term steroid or diuretic therapy.

WARNING

Especially when using a sodium bicarbonate cleaning powder, the spray should never be directed into the gingival sulcus or onto the gingival margin, as this can result in unnecessary abrasion of the gingival tissues and/or extension of the periodontal pocketing, with associated clinical complications.
Caution should be exercised in dealing with dentine surfaces, root cement and composite fillings.

Caution

It is important to air purge the handpiece after each treatment to prevent clogging.

The air purge must always be performed with the polisher nozzle mounted in the handpiece.

Do not leave powder in the powder container over the night.

5 Cleaning and maintenance

5.1 General cleaning procedures

Note

Always set the water flow to fully open before running the cleaning cycle (dots in line, see picture).

Air purge quick cleaning function

With the polisher mode active, a press on the C button will air purge the handpiece for a few seconds. Air purge the handpiece after each treatment to prevent clogging.

Automatic cleaning function for the scaler and polisher

1. Turn off the scaler or polisher by pressing the “S” or “P” key for 3 seconds. The blue function indicator turns off.
2. Place the scaler and/or the polisher handpiece over the bowl and first press the cleaning key “C” and then the S and/or the P key.
3. The cleaning cycle starts and stops automatically after 80 seconds.

Caution

The automatic cleaning function must always be performed with the polisher nozzle mounted in the hand-piece.

Cleaning of the equipment/components

Wipe off with a soft cloth and use a 45% isopropanol and detergent solution

Cover and control panel	
Polisher handpiece, tubings and cables	
Cap for powder container	

Wash at max 65°C (149°F)

Powder container	
Medicament bottle	
Cap for medicament bottle	

Autoclave in steam at max 135°C (275°F)
or wash at max 95°C (203°F)

Scaler tips	
Polisher nozzle	
Torque wrenches	
LM-ErgoGrip LED	
LM-ErgoGrip Focus LED	
LM-ProPower scaler handpiece	

5.2 Recommended cleaning procedure

Beginning of the day

Run the automatic cleaning cycle with clean water for both the scaler and polisher. See instructions on page 25.

After each treatment

- To prevent clogging, air purge the polisher handpiece after each treatment. See instructions on page 24.
- Run the automatic cleaning cycle with clean water for both the scaler and polisher. See instructions on page 25.
- Wipe off the cover, control panel, handpieces and the hoses with a soft cloth. Use a 45% isopropanol and detergent solution.
- Wash the nozzle in an ultrasonic bath (40-50°C), for at least 3 minutes, before cleaning/sterilization. If ultrasonic cleaning not is possible, flush the nozzle in warm water.
- Wash the ErgoGrip, the tip, the nozzle and possibly the scaler handpiece and autoclave according to the clinic's routines.

End of the day

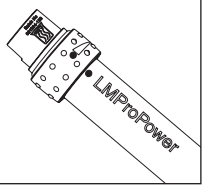
- Run the automatic cleaning cycle with clean water for both the scaler and polisher handpiece. See instructions on page 25.
- Remove and wash medicament bottle, bottle cap and powder container at a maximum temperature of 65°C (149°F).
- Wipe of the powder container cap with a soft cloth. Use a 45% isopropanol and detergent solution.

Note

Autoclaving the handpiece regularly may shorten the life time of the scaler handpiece.
Therefore we recommend to just autoclave the ErgoGrip and the scaler tip after each patient.

Caution

Before cleaning and sterilizing; the handpiece water control ring must be set to fully open (dots in line, see picture)



Note

Always set the water flow to fully open before running the cleaning cycle (dots in line, see picture).

Caution

Do not sterilize any scaler accessories using dry heat or chemical autoclaves. This may damage the material.

Weekly (bottle version)

- Run the automatic cleaning cycle with an anti-microbial cleaning agent solution in the bottle, for example Planosil, for both the scaler and polisher. See instructions on page 25. We recommend to use a separate bottle for the cleaning agent solution. Concerning exposure times of cleaning agent, follow instructions given by manufacturer.
- Before patient treatment; to rinse the lines from cleaning agent solution put clean water in the bottle and run the automatic cleaning cycle for both the scaler and polisher until clean water comes out of the handpiece.

5.3 Maintenance

Power cord

Inspect the power cord, cables and the handpiece hose daily to insure that the equipment is in good condition without mechanical damage.

Caution

A petroleum based lubricant on the o-rings may shorten their durability time.

O-rings (bottle and powder container connectors, polisher nozzle)

Lubricate the O-rings regularly with a glycerine based, water soluble lubricant. Vaseline may also be used, but it may shorten the durability time of the O-rings.

Tips

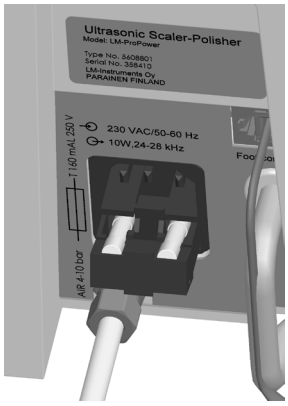
When a tip is bent, altered, or worn more than 2 mm it will loose performance and must be exchanged. Check the tip length weekly by comparing the tip to a tip check card.

WARNING

A tip that is bent, altered, scratched or worn more than 2 mm will loose performance and must be exchanged. Prolonged use may cause tip breakage and injury to the patient.The operator should be aware of that ultrasonic instruments with small diameters are subject to breakage at any time. If not used correctly or with too much power or force the instrument WILL break.

Exchanging fuses

1. Disconnect the power cord from the AC power outlet and the unit.
2. Open the fuse holder on the rear side of the unit.



3. Inspect the fuses for damages. Replace damaged fuses with new ones. Verify the fuse specifications according to the Technical data section on page 30.
4. Close the fuse holder.

6 Troubleshooting

6.1 General

Problem	Action
The green indicator lamp is off.	Check that the power cord is connected properly. Check the fuses and replace if necessary. For further instruction, read the Exchanging fuses section on page 27.
The two blue indicator lamps for scaler and polisher is flashing simultaneously.	Check that the foot control cable is connected in both ends and is not defective.

6.2 UltraLED Scaler

Problem	Action
The green StandBy indicator and the blue Scaling mode indicator mode is illuminated, but the tip does not vibrate properly.	Check that a working mode is chosen/illuminated. Check that the tip is firmly tightened with the torque wrench. Check that the tip is not worn more than acceptable according to the tip check card. If the problem is not resolved, try another tip, preferably unused.
The tip threads don't fit smoothly onto the handpiece.	If the tip threads are damaged, clean the handpiece threads with compressed air and try another tip, preferably unused. Throw away the damaged tip. If the problem still remains, contact your dealer for service instructions, because the handpiece threads might be damaged.
No or low fluid flow.	Check if dry mode is activated by mistake. Set the water control ring on the handpiece to fully open. If the fluid flow is still insufficient, remove the tip and inspect if fluid comes out of the handpiece. If yes, replace the tip. If not, remove the handpiece and use the LM-ProPower Fixer tool to carefully open up the waterline from the connector side.
Tap water version:	Check that the water supply conforms to the pressure data in the Technical data.
Bottle version:	Listen if the pump is running. Check the fluid level in the medicament bottle. Check that the bottle cap is tightened and connected correctly to the unit connector. Check that the O-rings on the unit connector are lubricated and are in good condition. Replace them if leakage occur, see the O-rings section on page 27.

Problem	Action
The handpiece is over-heated.	Check that the fluid flow is sufficient (recommended: 20 ml/min).

6.3 AirLED Polisher

Problem	Action
There is a stop in the polisher nozzle and no air and powder is coming out from the nozzle.	Place the nozzle in an ultrasonic bath with WARM water for a couple of minutes. Flush the nozzle in water and dry it with compressed air, reconnect and try again.
It is difficult to insert the polisher nozzle into the handpiece.	Check that the o-rings on the polisher nozzle are lubricated and in good condition.

If problems cannot be resolved according to this troubleshooting guide, please contact your dealer for further service support.

7 Technical data

Manufacturer	LM-Instruments Oy PL 88 (Norrbyn rantatie 8) FI-21601 Parainen, FINLAND
Model	LM-ProPower CombiLED
Classification	EN60601-1: Class 1, Type B 93/42 EU: Medical products, class IIa
L x W x H	270 x 110 x 165 mm (without bottle and powder container)
Weight	3400 g
Voltage	100 Vac, 50-60 Hz 115 Vac, 50-60 Hz 230 Vac, 50-60 Hz
Primary fuse	T500 mAH, 250 V, Ø5x20 mm (100 Vac) T400 mAH, 250 V, Ø5x20 mm (115 Vac) T200 mAH, 250 V, Ø5x20 mm (230 Vac)
Power cord	Separate with protective earth plug
Power consumption	Max. 40 VA
Scaler power consumption	Max. 24 VA
Scaler power output	Max. 10 W (24 kHz - 28 kHz, automatic tuning)
Ambient temperature	Transport and storage -40°C to 70°C (-40°F to 158°F)
	Operation 10°C to 40°C (50°F to 104°F)
Relative humidity	Transport and storage 10% to 100%
	Operation 10% to 95%
Water supply pressure (version conn. to tap water)	1 - 10 bar (0,1–1,0 MPa, 14,5–145 PSI)
Water consumption	10 - 50 ml/min
Bottle volume (bottle version)	500 ml
Air supply pressure	4 - 10 bar (0,4 - 1,0 MPa, 58 - 145 PSI) Use only dry and filtered compressed air.
Air consumption	Max. 20 l/min
Powder container capacity	45 g

Installation and service of the product is only to be performed by authorized service personnel by the manufacturer.

WARNING

Immedately after using any kind of medicament in the medicament bottle, run the automatic cleaning cycle with clean water in the medicament bottle for both the scaler and the polisher until clean water comes out of the handpieces.

Medicaments that can be used

- Clean water
- Cetylpyridinium chloride
- Clorhexidine
- Essential oils
- Hydrogen peroxide, 3% USP
- Povidine iodine, 10% solution
- Saline solution
- Sangurinara extract
- Planosil, Oxygenal and Dentosept (for unit cleaning)
- Sodium hypochlorite 1% solution

8 Warranty and Declaration of conformity

8.1 Warranty

The manufacturer hereby warrants that the unit will be free from defects arising from faulty materials or workmanship for a period of twentyfour (24) months from the date of purchase by a customer from an authorized dealer (“Limited Warranty”).

This Limited Warranty does not cover the scaling tips, which are only warranted for a period of three (3) months from the date of purchase by a customer from an authorized dealer.

This Limited Warranty is limited to, free of charge, repair or replacement of any defective parts by the authorized dealer or distributor from whom the unit was purchased by the customer. This Limited Warranty applies only if the unit and/or the scaling tips are installed and used by the customer according to the instruction furnished herein, is connected to a proper power supply, is not misused or abused, and there is no evidence of tempering, mishandling, neglect, accidental or wilful damage or modifications.

The customer must contact the authorized dealer from whom the unit and/or ultrasonic scaling tips were purchased to request repair or replacement under this Limited Warranty.

This Limited Warranty is void if service or repair is performed by persons not authorized by the manufacturer. Normal wear and tear is specifically excluded from this Limited Warranty.

Manufacturer disclaims any express warranty not provided herein and any implied warranty, guarantee or representation as to suitability for any particular purpose, performance, quality, and absence of hidden defects, and any remedy for breach of contract, which but for this provision, might arise by implication, operation of law, custom of trade, or course of dealing, including implied warranties of merchantability and fitness for a particular purpose, except as provided in this limited warranty.

The manufacturer further disclaims any responsibility for losses, expenses, inconveniences, special, indirect, secondary, or consequential damages arising from ownership or use of the product.

WARNING

No modification of this equipment is allowed.

8.2 Declaration of conformity

The manufacturer hereby declares that the
LM-ProPower CombiLED unit
Class I, type B according to EN60601-1 equipped with original accessories conforms to the essential requirements of the Medical Device Directive 93/42/EEC with reference to the following harmonized standards:

IEC 60601-1, Third edition 2005
EN 60601-1: 2006

Classification: Medical products, Class IIa:

CE 0537

8.3 EMC - Guidance and manufacturer’s declaration

Guidance and manufacturer's declaration - electromagnetic emissions		
The LM-ProPower is intended for use in the electromagnetic environment specified below. The customer or the user of the LM-ProPower should assure that it is used in such an environment.		
Emission test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The LM-ProPower uses RF energy only for its internal function. Therefore, it's RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The LM-ProPower is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Not applicable	

Guidance and manufacturer's declaration - electromagnetic immunity			
The LM-ProPower is intended for use in the electromagnetic environment specified below. The customer or the user of the LM-ProPower should 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	±6 kV contact ±8 kV air	±6 kV contact ±8 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	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage varaiations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the LM-ProPower requires continued operation during power mains i interruption, it is recommended that the LM-ProPower be powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/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.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The LM-ProPower is intended for use in the electromagnetic environment specified below. The customer or the user of the LM-ProPower should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the LM-ProPower including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	$d = 1,2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	$d = 1,2\sqrt{P}$ 80 MHz to 800 MHz $d = 2,3\sqrt{P}$ 800 MHz to 2,5 GHZ were 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 metres (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 and 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 fro 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 LM-ProPower is used exceeds the applicable RF compliance level above, the LM-ProPower should be observed to verify normal operation. If abnormal performance is observed additional measures may be necessary, such as reorienting or relocating the LM-ProPower.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the LM-ProPower

The LM-ProPower is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the equipment can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the LM-ProPower as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter** m		
	150 kHz to 80 MHz $d = 1,2\sqrt{P}$	**80 MHz to 800 MHz** $d = 1,2\sqrt{P}$	**800 MHz to 2,5 GHz** $d = 2,3\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for 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.

LM-Instruments Oy

PL 88 (Norrbyn rantatie 8)

FI-21601 Parainen

Finland

Tel. +358 2 4546 400

Fax +358 2 4546 444

info@lminstruments.com

www.lminstruments.com

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