Lares Research

ProStyle E Motor Control

Operating Manual

REF 13186 CE 0120

Lares Research
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Identification:
Electronically controlled unit for dentistry allowing operation of the ProStyle E Motor with variable speed using the dental unit rheostat pedal.

USA Caution: Federal law restricts this device to sale by or on the order of a Dentist.

Intended Use:
Product intended for professional use only. Use in dentistry for general dentistry work. The system is designed to control a ProStyle E Motor which can drive a dental handpiece (gear ratio 1:1 or 1:5) fitted with appropriate burs.
Any use other than that for which this device is intended is prohibited and may prove dangerous.
Caution! This device is not designed for use in an explosive atmosphere (anesthetic gas)

Technical Data:
Description
The ProStyle E Motor Control System consists of:
- Motor hose output
- A pneumatic 4 hole connection input
- An electrical power supply and plug cord
- ProStyle E motor control box

Classification
Class IIa in accordance with European Directive 93/42/EEC concerning medical devices. This medical device is in compliance with the legislation in force.

Electrical Safety
According to IEC 60601-1 standard (General safety for medical Electrical Equipment), the device shall be classified as a class II type B device. Associated terminology is defined in sections 3.14 (3.13 in class I) & 3.132 of the same standard.
The following requirements as specified in IEC 60601-1 apply:
- Protection against electrical shock
- Ingress of liquids
- Protection against excessive temperatures and other safety hazards.

Electric insulation class
Class 1 per IEC60601-1 (apparatus protected against electric shock).
Degree of protection
IP40 (protection against insertion of objects larger than 1mm).

Electromagnetic Compatibility
Electro-medical equipment needs special precautions regarding
EMC and needs to be installed and put into service according to
the EMC information provided in this document. Corresponds to the electromagnetic compatibility in accordance with IEC 60601-1-2. Declaration by the manufacturer regarding electromagnetic compatibility.

Hose Junction
Hose with connector type ProStyle E Motor. Brushless type, 3 phase. Effective power according to the type of electronic power supply used.
Synchronous motor with permanent magnets. Body of chromium and nickel plated brass. Stainless steel nose.

Electrical and Pressure Data
Voltage: 100 – 240 VAC
Frequency: 47 – 63 Hz
Nominal power: 90 W
Maximum input power: 160W
Maximum air pressure: 43.5 psi (5 bar)
Minimum air pressure: 40.6 psi (3 bar)
Caution! If the input air pressure is below the minimum threshold (40.6 psi), the motor could not reach the set point speed.
Cooling
Though compressed air from the unit. Place the flow meter on the connector and set to 10 normliter/min (figure 2).
Air consumption
10 Nl/min
Dimensions
ProStyle E Motor Control box; 125 x 145 x 75mm
Motor hose length; 1.66M
Power supply; 130 x 75 x 45mm
Weight
ProStyle E Motor Control box; 600g (2.68 oz.) without the cable.
Power Supply; 650g

Motor speed
Maximum 40,000 rpm
Recommended Rotation speed
From 1000 rpm to a maximum 40,000 rpm
Direction
Clockwise and anti-clockwise

Important
The device must not be started without a bur inserted into the chuck.
To ensure that your Contra-angle/micro motor unit functions with maximum efficiency, it must be cooled by an air supply of 8-10 standard liters per minute on the nose of the micro-motor (figure 2).
Never mount an instrument on a rotating motor.
Ensure that the ProStyle E Motor hose is not bent or pinched.
Installation
Before installing, please read carefully this product instruction.
Place the ProStyle E Motor control on a flat surface capable of bearing its weight. It may be positioned on a table, dental unit or any other surface but under no circumstances on the floor. It is not designed to be placed on wet surfaces or to come in contact with liquids.
Connect the power cord, (figure 3). Be sure the power switch is off. Connect the power supply cable (1) to the input connector (2) and turn right to lock, (figure 4). Connect the ProStyle E Motor to the end of the control tubing; align the connector to the motor with the index pin, (figure 5). Connect the 4-way hose to the Prostyle E Motor Control, tighten clockwise, (figure 6). Turn on the dental unit, then turn on the Prostyle E Motor Control, (figure 7). The power on light on the front panel lights up and is ready for use.

Operation
Environment:
Temperature: +10C (50F) and 25C (77F)
Relative Humidity: 30% and 80%
Atmospheric pressure: 70 kPa to 106kPa
Altitude: 0 to 3048m (0 to 10,000 ft)
ProStyle E motor speed:
Set the maximum motor speed by turning the speed knob clockwise to increase speed.
The maximum motor speed can be set to any value between 1000 rpm and 40,000 rpm
(1:1 handpiece: 1000 to 40,000 rpm)
(1:5 handpiece: 5000 to 200,000 rpm).
ProStyle E motor rotation direction:
Change the direction by pressing the button on the front panel (next to the speed knob).
Pressed = reverse direction (Counterclockwise)
Unpressed = forward direction (clockwise; normal status).
Caution! Always check the instrument rotation direction before using it.

Standard use:
Connect a handpiece.
Set the maximum speed.
Select the rotation direction to forward (clockwise) or reverse (counterclockwise).
Press the dental unit foot pedal to start the ProStyle E Motor (the pedal actuation is progressive; motor speed varies up to the set maximum based on how far the pedal is depressed).
Caution! If the foot pedal is pressed before switching on the Prostyle E Motor Control the motor will not start to run until the foot pedal is released and pressed again.
Caution! Verify that the handpiece gear ratio corresponds to one of those displayed on the speed knob.
Disposal
This device must be recycled. Electrical and electronic equipment may contain dangerous substances which constitute health and environmental hazards. The user must return the device to an approved body for treatment and recovery of this type of equipment (European Directive 2002/96/EC).

Maintenance
Separately clean the device before the treatment of each patient.
Important
- The instrument is delivered "non-sterile".
- Before using for the first time and within a maximum of 30 minutes after each treatment, clean and disinfect. Observing this procedure eliminates any blood, saliva or saline solution residues and prevents the transmission system from being blocked.
- Do not clean in a washer/disinfectant unit.
- Do not immerse in an ultra-sonic bath.
- Use only Lares Research provided maintenance products and parts or those recommended by Lares Research. Using other products or parts may cause operational failure and/or void the warranty.

Precautions of Use
The universal precautions, in particular wearing of personal protective equipment (gloves, goggles etc.), should be complied with by medical personnel using or performing maintenance of medical devices that are contaminated or potentially contaminated.
Pointed and sharp instruments should be handled with great caution.
We recommend that the motor control is cleaned as directed below before the initial first use and subsequently after each treatment.

Important
In the event of prolonged disuse, the instrument must be stored in a dry environment.

Cleaning-disinfection
Disinfect the external surfaces of the Prostyle E Motor Control unit and hose by gently rubbing with a clean cloth soaked in a suitable product (Isopropyl alcohol for about 15 seconds) or with a disinfecting disposable wipe recommended for dental or surgical instruments.
Caution! Products containing acetone, chlorine and bleaches are not recommended as disinfectants. To keep the surfaces of the hose in good condition, it is advisable to periodically wipe the complete length of it with a cloth dusted with talcum powder.
Do not immerse in disinfectant solution.
Do not immerse in ultrasonic bath.

Servicing
Never disassemble the device. For any modification or repair, we recommend that you contact your account manager directly. Lares Research asks that you have the device checked or inspected once per year.

Transport and storage conditions
Temperature between -25C (-13F) and 70C (158F), relative humidity between 10% and 100%, atmospheric pressure 50 kPa to 106kPa (7.3 to 15.3 psi).
Information
The technical specifications, illustration and dimensions contained in these instructions are given only as a guide. They may not be the subject of any claim. The manufacturer reserves the right to make technical improvements to its equipment, without amending these instructions. For all additional information, please contact Lares Research directly at 1-888-333-8440.

Other Precautions for Use
The device must be used by a qualified person in accordance with the current legal provisions concerning industrial safety, health and accident prevention measures, and these working instructions. In accordance with these requirements, the operators:
- must only use operating devices that are in perfect working order. In the event of irregular functioning, excessive vibration, abnormal heating or other signs indicating malfunction of the device, the work must be stopped immediately; in this case, contact repair center.
- must ensure that the device is used only for the purpose for which it is intended, must protect themselves, their patients and third parties from any danger, and must avoid contamination through the use of the product.

Rest the device on a suitable support to avoid risks of infection for yourself, the patient or third parties.
Excess material from products used for maintenance (lubricants, cleaning products and disinfectants) originating from the motor may penetrate into the electric motor and interfere with its functioning. It is essential to follow the maintenance instructions accompanying each product. Never lubricate the electric motor.
Recommendations
It is essential to use dry, purified compressed air in order to ensure the long working life of the device. Maintain the quality of the air and water by regular maintenance of the compressor and filtration systems. The use of unfiltered hard water will lead to early blockage of the tubes, connectors and spray ports.
The device must not be used in the presence of open lesions, injury to soft tissue or recent extractions. The exhaust air could propel infected material into the wounds and cause infections and risk embolism.
The device is intended for medical treatment only; any use other than that for which this product is intended is unauthorized and may be dangerous. The medical device meets all the current legal requirements.

Warranty
Each Lares ProStyle E Motor Control is warranted against defects in materials and workmanship for a period of 3 years from the date of purchase.
Additional Conditions of Warranty:
1. Warranty registration is automatic as of shipping date (Outside the US warranty registration may be required).
2. The motor must be operated and maintained in accordance with procedures outlined in these instructions.
3. The motor must not be subjected to abuse or neglect.
4. The motor must not be repaired or disassembled by anyone other than Lares Research or your authorized Lares distributor. Lares Research will repair or replace at its discretion without charge, any defective parts covered by this warranty provided the ProStyle E motor is returned to the factory, transportation prepaid. (Outside the US return to your authorized Lares distributor.) Lares Research makes no other warranties expressed or implied.

Device operating errors and troubleshooting

Error	Cause of error	Action
The motor does not start	The pedal is already pressed when starting device.	Release foot pedal and press again.
	The motor is not connected.	Check motor connection. Contact Lares Research tech service dept.
	The motor cable may be damaged.	Check motor cable. Contact Lares Research tech service dept.
	System electrical fault.	Contact Lares Research tech service dept.
The motor stops	The motor is blocked for more than 2 seconds	Release foot pedal and press again.
	The motor control card limits the power supplied to the motor to prevent motor overheating.	Avoid extended use.
	Overheating of motor control card (electrical control of motor).	Wait until the system cools. Contact Lares Research tech service dept.
	System electrical fault.	Contact Lares Research tech service dept.

Electromagnetic Compatibility
(Technical description)

Precautions Regarding Electromagnetic Compatibility (EMC)
Electro-medical equipment need special precautions regarding EMC and need to be installed and put into service according to the EMC information provided in this document.

Caution! Dental professionals need to be aware of potential electromagnetic interference between electronic dental devices and active implantable medical devices, and should always inquire about any devices implanted in the patient.

Caution! The ProStyle E system complies with the EMC requirements according to IEC 60601-1-2. Radio transmitting equipment, cellular phones, etc. shall not be used in close proximity to the unit since they could influence the performance of the unit. Special precautions must be taken when using the strong emission sources such as High Frequency surgical equipment and similar equipment so that the HF cables are not routed on or near the unit. If in doubt, please contact a qualified technician or Lares Research.
The ProStyle E system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, ProStyle E system should be monitored to verify normal operation in the configuration in which it will be used.
Caution! The use of accessories, transducers and cables other than those specified, with the exception of transducers and cables sold by Lares Research as replacement parts for internal components, may result in increased emissions or decreased immunity of the ProStyle E system.

Guidance and Manufacturer's Declaration – Electromagnetic Emissions
The ProStyle E system is intended for use in the electromagnetic environment specified in tables 1 through 3. The customer or user of the ProStyle E system should ensure that it is used in such and environment.
Table 1.

Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	ProStyle E system uses RF energy only for its internal function. CISPR 11 therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The ProStyle E system 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	Compliant	
Voltage fluctuation/flicker emissions IEC 61000-3-3	Not applicable	

Table 2.

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	Floor 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 lines no input/output	±2 kV for power supply lines ±1 kV for lines no input/output	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1kV line to line ±2 kV line to earth	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips and outages 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 ProStyle E system requires continued operation during power mains interruptions, it is recommended that the ProStyle E system be powered from an uninterruptable power supply or a battery.
Power frequency (50/60 Hz) Magnetic field IEC 61000-4-8	3A/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 AC Mains voltage prior to application of the test level. Essential performance: The essential performance is the maintaining of the visual lighting intensity of the LED and the maintaining of motor speed. Maximum allowed speed deviation is ±5%.			
Conducted RF IEC 61000-4-6	3 Vrms 150kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the ProStyle E system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance: $d=1.2\sqrt{P}$ 150 kHz to 80 MHz $d=1.2\sqrt{P}$ 80 MHz to 800 MHz $d=2.3\sqrt{P}$ 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: 
Radiated RF IEC 61000-4-3	3 Vrms 80 MHz to 2.5 GHz	3 Vrms	

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur's 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 where the ProStyle E System is used exceeds the applicable RF compliance level (table2.) the ProStyle E system should be observed to verify normal operation. If abnormal operation is observed , additional measures may be necessary, such as reorienting or relocating the ProStyle E system.
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 ProStyle E system

The ProStyle E system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the ProStyle E system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the ProStyle E system as recommended in table 3, according to the maximum output power of the communication equipment.
Table 3.

Rated maximum output power of transmitter [W]	Separation distance according to frequency of transmitter [m]		
	150 kHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
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 in table 3, the recommended separation distance d in meters [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: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

fig. 2

Figure 3.

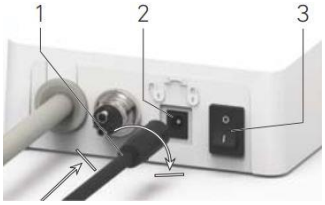

Figure 4.

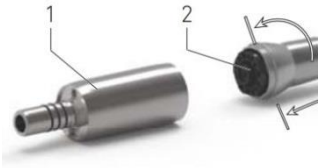

Figure 5.

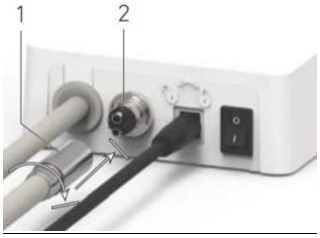

Figure 6.

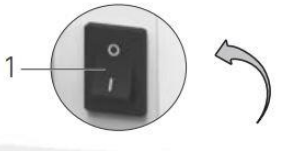

Figure 7.