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. This unit corresponds to the electromagnetic compatibility in accordance with IEC 60601-1-2 and IEC 80601-2-60 and declaration by the manufacturer regarding electromagnetic compatibility.

Motor Type: Brushless type, 3 phase motor, synchronous with permanent magnets.

Electrical and Pressure Data: Voltage: 100 – 240 VAC. Frequency: 50-60 Hz. Nominal power: 65 W. Maximum input power: 150W. Maximum air pressure: 72.5 psi (5 bar). Minimum air pressure: 43.5 psi (3 bar). Air consumption: Less than 40 nl/min

Caution: If the input air pressure is below the minimum threshold (17.5 psi), the motor will not turn on. If operating in variable speed mode, a minimum of 43.5 psi (3 bar) is required to meet maximum motor speed.

Cooling: Cooling is conducted through compressed air from the unit.

Spray Air and Water: Set spray air and water pressure per contra-angle attachment instructions, but do not exceed 40 psi (2.8 bar).

Dimensions: Perceptive Motor Control box: 103 x 84 x 28 mm. Motor hose length: 1.6M. Power supply: 178 x 64 x 41mm. Lenovo M7 Tablet: 176 x 103 x 9mm.


Motor Rotation Speed: From 1,000 rpm to a maximum 40,000 rpm

Motor Direction: Clockwise and anti-clockwise

Installation
Before installing, please read carefully.

Tablet Setup:
Important! Set up the tablet before connecting it to the Perceptive system. 1. Turn on the tablet by pressing and holding the power button down until the Lenovo logo appears (Figure 7). 2. Follow the on-screen prompts to configure the tablet. You must correctly connect to WiFi and sign in to a Google account before downloading the Perceptive app. Refer to the Lenovo user guide for appropriate use of the Lenovo tablet. 3. Open the Google Play store app. 4. Search for the Perceptive app.

System Installation: 1. Choose a location to mount the Perceptive motor control box on a flat surface capable of bearing its weight. It may be positioned horizontally or vertically on, or under, a table, dental unit, or any other surface but under no circumstances on the floor. It should be located close to where the handpiece supply hoses exit on the delivery system. It is not designed to be placed on wet surfaces or to come in contact with liquids. 2. For under-mounting clean mounting surfaces with included alcohol wipes. Wipe away excess alcohol with the provided dry wipe. 3. Apply two adhesive backed Velcro pads to one side of the control box. (Figure 1) Attach the other Velcro pads to the first pads by velcro. Remove the adhesive covers and push firmly against surface to mount box. Note: if the control box will not be mounted with the Velcro pads the four rubber feet may be affixed to one side of the control box. 4. Connect the power cord to the power supply (Figure 2). Place the power supply on the floor or in the electrical outlet box and plug the power cord into an electrical outlet.

Caution: Do not connect control box to a power supply other than the included unit. 5. Connect the power supply cable to the motor control box (Figure 3). 6. Connect the Perceptive motor to the end of the control tubing; align the connector pins on the motor with the holes on the tubing, tighten clockwise (Figure 4). 7. Connect a 4 hole handpiece hose from your delivery system to the Perceptive motor control and tighten clockwise (Figure 5). Place the Perceptive motor in the evacuated handpiece hose nest. 8. Plug the tablet power chord into the motor control box (Figure 6). 9. Make sure the tablet is turned on. If not, turn on the tablet by holding the power button down until the Lenovo logo appears (Figure 7). 10. Plug the tablet power chord into the tablet (Figure 8) and open the Perceptive app. When prompted, allow access to the microphone to enable voice control. 11. Chose a location to mount the tablet to a flat surface capable of bearing the weight of the tablet. Figure (9) It may be mounted on a dental unit arm or any other available surface. It should be located where the user can easily view and reach it during operation. The tablet mount uses a combination of adhesive and suction to adhere to its mounting surface. Before applying the adhesive surface, clean the mounting surface with an alcohol pad, then dry with the dry wipe.
Motor Control Box Status LED Meaning:

- Motor LED Time-out: Adjusts how long the light remains on (delayed shut off) after motor operation ends.
- Motor LED Fade-out: Adjusts how fast the light goes out after motor control is released.
- Motor LED Time-out: Adjusts how long the light remains on (delayed shut off) after motor operation ends.

Motor Control Box Status LED Meaning:
The front panel of the motor control box is equipped with a status LED light with the following meanings:

<table>
<thead>
<tr>
<th>Front panel LED</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN (steady)</td>
<td>Normal operation</td>
</tr>
<tr>
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<td>Overcurrent</td>
</tr>
<tr>
<td>RED (steady)</td>
<td>Drive Fault</td>
</tr>
<tr>
<td>WHITE (pulsating)</td>
<td>System Low Power Mode</td>
</tr>
</tbody>
</table>

Device Maintenance

- Wearing of personal protective equipment (gloves, goggles etc.), should be completed 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.
- In the event of prolonged disuse, the instrument must be stored in a dry environment.
- 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.
- We recommend that the motor control is cleaned as directed below before the initial use and subsequently after each treatment.

Cleaning-disinfection Of External Surfaces:
Clean and disinfect the external surfaces of the Perceptive motor control unit, tablet, and hose by gently rubbing for about 15 seconds with a clean cloth soaked in isopropyl alcohol.

General Settings:
Additional motor control settings may be adjusted by first pressing the Settings (8) button (Figure 11). These consist of (Figure 12):
- Display sleep: Adjusts time of non-use before tablet display goes into sleep mode.
- Pressure: select to display air pressure in PSI or BAR.
- Variable Pressure Mode: FULL uses the entire air pressure range of the foot control to change motor speed. LIMIT only uses a portion of the air pressure range. (Full is recommended.)
- Status LED: Adjusts the brightness of the motor control box LED status indicator. (See below for description of Status LED signals).
- Motor LED Brightness: Adjusts the brightness of the motor LED output and therefore the attachment light output brightness.
- Motor LED Fade-in: Adjusts how fast the light comes on after foot control depression.
- Motor LED Fade-out: Adjusts how fast the light goes out after foot control is released.
- Motor LED Time-out: Adjusts how long the light remains on (delayed shut off) after motor operation ends.

To return to the main screen, touch the back arrow at the top left of the screen.

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Clean and disinfect the external surfaces of the Perceptive motor control unit, tablet, and hose by gently rubbing for about 15 seconds with a clean cloth soaked in isopropyl alcohol.

General Precautions

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

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 Lares Research for repair.
- 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 attachments 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 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 and Service
Warranty:
Each Perceptive motor control box, power supply and supply hose is warranted against defects in materials and workmanship for a period of 2 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 product must be operated and maintained in accordance with procedures outlined in these instructions.
3. The product must not be subjected to abuse and/or neglect.
4. The product 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 Perceptive motor control box, power supply and supply hose 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.

Servicing:
Never disassemble the device. For any modification or repair, we recommend that you contact your Lares account manager directly. Lares Research recommends that you have the device checked or inspected once every 3 years.

Transportation, Storage & Disposal

Transport and Storage Conditions:
Temperature between -25˚C (-13˚F) and 70˚C (158˚F), relative humidity between 20% and 80%, atmospheric pressure 500 hPa to 1060 hPa (7.25 to 15.37 psi).
Do not store the motor with a contra angle attached for extended periods of time.

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).

Troubleshooting

Motor Error:
When an error is detected on one of the motor phases, an error tone (three long beeps) will sound once on the tablet, and the icon above will keep blinking as long as the drive is activated by air pressure. To reset the error, release the pressure to deactivate the drive and ensure connectivity of the motor.

Temperature Warning:
A motor overheat protection system is in place. This will trigger:
1) If average current over a long period of time exceeds 600mA, motor torque will be slowly limited until the average current falls below 600mA.
2) If peak current exceeds 2500mA, motor torque will be quickly limited until peak current drops below 2500mA.

This issue is commonly caused by a faulty attachment (contra-angle, etc). If the issue only exists with the attachment on the motor, it is likely to have that attachment repaired. Contact Lares Research with any questions.

When any of the above conditions occur, the icon above will blink on the tablet, and a warning signal (three short beeps) will sound. The warning signal will keep repeating until the unit has exited the overheat condition.
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.

Accessories, Detachable Parts and Materials:
Item #
13187 - Replacement Motor
13189 - Replacement Tablet
13190 - Replacement Tablet Mount
13506 - Replacement O-Rings, Motor Nose Cone (3)
13191 - Replacement Motor Sterilization Caps (Set of front and back)
13192 - Replacement Power Supply
13507 - Replacement Hose Nut O-Ring
13509 - Replacement Communication Cable

Perceptive App Menu Guide: (Figure 11)
NOTE: See Operation sections for detailed use descriptions.
1) Maximum rpm chosen
2) Preset rpm buttons
3) Gear ratios (green, blue, red)
4) FWD/REV button
5) LED light ON/OFF button
6) Airflow button (Progressive mode, Instant mode)
7) Voice command symbol
8) Settings button
9) The air pressure being supplied to the system.
10) The speed at which the motor is spinning (bur speed will vary from this based on attachment ratio).
11) The current supplied to the motor.
12) The voltage supplied to the motor.

Questions?
Call 1-888-333-8440, Ext. 1
Lares Research
295 Lockheed Avenue
Chico, CA 95973
www.laresdental.com
Electrical safety and electromagnetic compatibility information

Device operating errors and troubleshooting

<table>
<thead>
<tr>
<th>Error</th>
<th>Status indicator</th>
<th>Cause of error</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The motor does not start</td>
<td>Slow blinking red (1 second)</td>
<td>The motor is not connected</td>
<td>Check motor connection. Contact Lares Research tech service dept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The motor cable may be damaged</td>
<td>Check motor cable. Contact Lares Research tech service dept.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>System electrical fault</td>
<td>Contact Lares Research tech service dept.</td>
</tr>
<tr>
<td>The motor stops</td>
<td>Solid red</td>
<td>The motor is blocked</td>
<td>Release foot pedal and press again.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Impact protection stop (sudden load increase)</td>
<td>Release foot pedal and press again.</td>
</tr>
<tr>
<td>The motor loses power</td>
<td>Fast blinking red (0.3 seconds)</td>
<td>The motor controller limits the power supplied to the motor to prevent overheating</td>
<td>Allow the motor to idle or stop preparation for a few seconds to allow the motor to cool down.</td>
</tr>
</tbody>
</table>

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 Perceptive 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 Perceptive system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the Perceptive 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 Perceptive system.

**Guidance and Manufacturer's Declaration – Electromagnetic Emissions**

The Perceptive system is intended for use in the electromagnetic environment specified in tables 1 through 3. The customer or user of the Perceptive system should ensure that it is used in such and environment.

**Table 1. Emissions test**

<table>
<thead>
<tr>
<th>Emissions test</th>
<th>Compliance</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF emissions</td>
<td>Group 1</td>
<td>Perceptive system uses RF energy only for its internal function.</td>
</tr>
<tr>
<td>CISPR 11</td>
<td></td>
<td>CISPR 11 therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.</td>
</tr>
</tbody>
</table>

**Table 2. Immunity test**

<table>
<thead>
<tr>
<th>Immunity test</th>
<th>IEC 61000-4-2 test level</th>
<th>Compliance level</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrostatic discharge (ESD)</td>
<td>±15 kV air</td>
<td>±15 kV air</td>
<td>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 Perceptive System is used exceeds the applicable RF compliance level (Table 2.1), the Perceptive system should be observed to verify normal operation. If abnormal operation is observed, additional measures may be necessary, such as reorienting or relocating the Perceptive system.</td>
</tr>
<tr>
<td>Electrical fast transient burst</td>
<td>±2 kV for power supply lines</td>
<td>±2 kV for power supply lines</td>
<td>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Surge</td>
<td>±15 kV line to line</td>
<td>±15 kV differential mode</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Voltage dips and sags</td>
<td>&lt;5% (95% dip in U) for 0.5 cycle</td>
<td>&lt;5% (95% dip in U) for 0.5 cycle</td>
<td>Mains power quality should be that of a typical commercial or hospital environment.</td>
</tr>
<tr>
<td>Magnetic field</td>
<td>30 A/m</td>
<td>30 A/m</td>
<td>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</td>
</tr>
</tbody>
</table>

**Table 3. Recommended separation distances between portable and mobile RF communications equipment and the Perceptive system**

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

<table>
<thead>
<tr>
<th>Rated maximum output power of transmitter [W]</th>
<th>Separation distance according to frequency of transmitter [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>0.12</td>
</tr>
<tr>
<td>0.1</td>
<td>0.38</td>
</tr>
<tr>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>10</td>
<td>3.8</td>
</tr>
<tr>
<td>100</td>
<td>12</td>
</tr>
</tbody>
</table>

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 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.