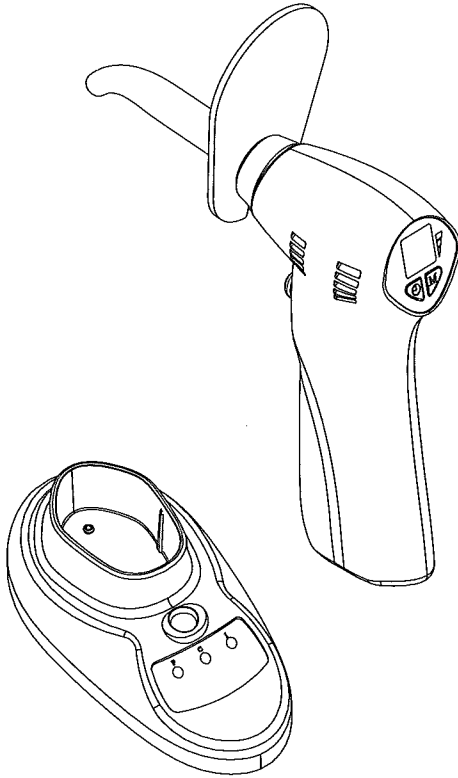


User Manual

LED Curing Light

Vector LED Turbo

Mini LED handpiece fits in your hand perfectly



VECTOR R & D INC.

6824 19TH ST#230 UNIVERSITY PLACE

WA 98466 USA; Website: www.vectorusa.net

Table of Content

1. Safety Precautions.....	p. 3
2. Product Description & Fields of Application.....	p. 4
3. Technical Features.....	p. 4~5
3.1 Charging base	
3.2 Hand piece	
3.3 Operation Environment	
3.4 Transportation and Storage Environment	
4. Package Content.....	p. 5
5. Additional Symbols.....	p. 6
6. Installation.....	p. 6~7
6.1 Charging base	
6.2 Indicator on the charging base	
6.3 Light Guide / Battery Charging	
6.4 LED indicator on the control panel	
7. Operation.....	p. 8
8. Operating Errors / Trouble shooting.....	p. 9
9. Measurement of light intensity.....	p. 9
10. Cleaning / Disinfecting / Sterilizing.....	p. 10
11. Disposal.....	p. 10
12. Liability.....	p. 11
13. Warranty.....	p. 11
13.1 Malfunction	
13.2 Repair	
13.3 Warranty Exception	






Caution:

U.S. Federal Law restricts this device to sale by or on the order of a dental professional.

1. Safety Precautions

Prior to installation and start-up of the unit, carefully read the instructions provided herein!

As with all technical devices, the proper function and safe operation of this unit depend on the user's compliance with the safety recommendations presented in these operating instructions.

- Before operation, you have to read user manual carefully.
- Refer to Section 10, Cleaning / Disinfecting / Sterilizing for sterilizing instructions.
-  CAUTION: This curing unit produces extremely high curing energy output! A significant increase in curing energy is possible compared with equipment you have previously used. It is important to obey the following precautions and procedures:
- Do not place light directly on or toward unprotected gingival or skin.
- Adjust your curing techniques in accordance with the increase in curing energy. Some examples are; decrease curing time, increase composite thickness, increase distance between light guide tip and light cured materials.
-  CAUTION: Do not look directly into the light emitted from this curing unit. Do not use this device without suitable protective eyeshade for the operator, assistant and patient. Suitable protective eyeshade should blocks most energy below 550nm wavelength.
-  CAUTION: Persons having a history of photosensitive reactions or who are using photosensitizing drugs should not be exposed to the light from this unit.
-  CAUTION: Equipment is not suitable for use in the presence of flammable anesthetic mixture with air, nitrous oxide or environment full of flammable material.
-  CAUTION: Don't dispose of the battery into fire or take battery apart.
- To protect the light guide, after each curing procedure is completed, the handpiece should always be placed into its holder.
- To obtain a safety operation, we suggest that check your local AC power supply voltage before you buy and use this product from oversea.

2. Product Description & Fields of Application

The Vector LED Turbo curing light is a Halogen-like LED curing light. It incorporates blue and purple LED to achieve broad band wavelength intended for polymerization of light-activated materials by dental professionals. It emits wide light wavelength range of 390 to 480 nm i.e. the relevant range for both camphorquinone (CQ) and phenyl propanedione (PD) containing product. Though the majority of light-curing dental materials are responsive in this range of wavelengths, you need to contact the agent of the material to make sure it before usage.

Vector LED Turbo is a fast-curing LED light. It emits light output at about 2,100mW/cm², equal to that of Plasma light. 3 Seconds to cure most composite in the market. The mini handpiece also features:

- Broad wavelength polymerize virtually all resin-based composite in the market
- Palm-size, light-weight handpiece for comfortable hand hold.
- A perfect product for (female) dentists with smaller hand.
- Raised and large power switch for activating easily
- 4 Modes preset
 - High** (High intensity)
 - Low** (Low intensity)
 - Ramp Up** (Soft start)
 - Cycle curing** (for Othordontics)
- Built-in light checker in the charger
- 360 degree rotatable light tip allows treatment in any part of the mouth

3. Technical Data

3.1 Charging Base

AC Adapter:	INPUT : 100~240VAC , 0.8~0.4 A , 47-63HZ OUTPUT : 12VDC , 2.0A
Charging box input:	12V DC, 1A
Fuse ration :	250V/2A
Charging box output:	8.4 VDC / 1.2A
Power indicator:	Green LED
Charging indicator:	Orange LED
Light intensity indicator:	Blue LED
Dimensions (length/width/height):	133mm/66mm/40mm
Height with handpiece inserted:	168mm
Weight:	roughly 160g

3.2 Handpiece

Power supply:	Lithium battery – 7.4V DC, 2100mAh
Wavelength range:	390-480 nm
Dimensions:	
Diameter:	30 mm
Length (with/without light guide):	155 / 82 mm
Height:	145 mm
Weight (with light guide and battery):	Roughly 200 g

Charging Base and Handpiece

Time to charge empty battery:	Approximate 2.5 hrs
Relative humidity:	Max. 80% at 37°C Max. 50% at 40°C
Protection from electric shock:	Type BF (IEC601-1)
Equipment class:	Class II (IEC601-1)
Protection from ingress of liquids:	None
Protection from ingress of AP/APG:	None

3.3 Operation Environment

- Ambient temperature: 0°C ~ +40°C
- Relative humidity: 30% ~ 75%
- Atmospheric pressure: 700hPa ~ 1060hPa

3.4 Transportation and Storage Environment

- Ambient temperature: -10°C ~ +70°C
- Relative humidity range: 10% ~ 90%
- Atmospheric pressure: 500hPa ~ 1060hPa

4. Package Content

· charging base	1 pce
· LED Turbo Hand piece	1 pce
· Turbo light guide (#807)	1 pce
· Protection eye shield	1 pce
· Adapter with power cord	1 pce
· User direction manual	1 pce

5. Additional symbols

Attention, Consult accompanying Documents



Alternating Current



Type BF Applied Part



Equipment class: Class II (IEC601-1)



6. Installation of the Unit

6.1 Charging Base

- First please ensure that the voltage stated on the rating plate corresponds to be same as the voltage of local power outlet. The rating plate is attached to the bottom of the unit.
- Please place the charging base on a level and horizontal surface.
- Connect the power cable of the charging base to the main power outlet.
 - The green LED on the device is illuminated. This show that the unit is ready for operation; please refer to the below, "LED indicator of the charging base".

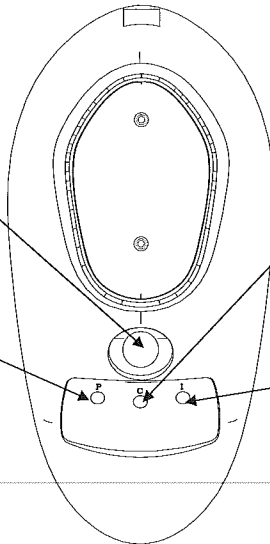
6.2 Indicator on the Charging Base

Light Checker Window

Place light guide here gently to measure light intensity.

Power indicator

(green LED) illuminates when the charging base is powered by plugging in power cord.



Charging LED indicator

(orange LED) illuminates when battery is charging. It goes out when charging is completed.

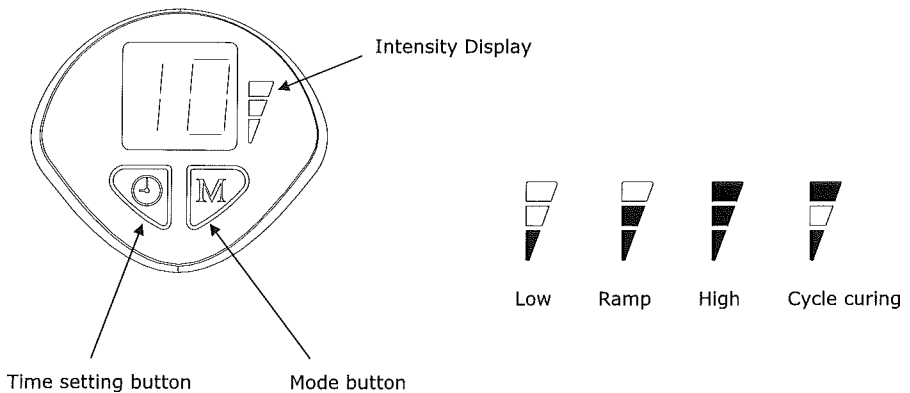
Light intensity indicator

(blue LED) illuminates when measuring light intensity, light output is at least 500mW/cm². If not lit, do not use the curing light due to low energy output.

6.3 Light Guide / Battery charging

- Autoclave the light guide prior to first use.
- Then insert the light guide into the handpiece until it snaps into place.
- Standard fiber optic light guide: 12>8mm turbo optic probe
- Prior to the first use, place the handpiece in the charging base to fully load the new rechargeable battery.
 - The orange LED of the charging base illuminates; please see also section LED Display of the Charging Base. The battery is fully charged once the orange LED is turned off.
 - Note: new batteries attain full capacity only after several charging / discharging cycles. Therefore, the battery charge may initially be sufficient for a smaller number of exposures only.

6.4 LED indicator on the control panel



Curing time selection:

(1) High MODE exposure at constant intensity about 2,100mW/ cm²

Time selection: **1, 3, 5** seconds

(2) Ramp up MODE initial 35~50% energy of high intensity and then switch to high intensity.

Time selection:

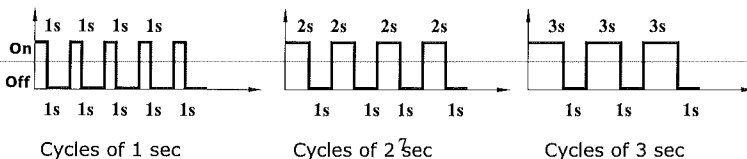
10 seconds (5 seconds low intensity + 5 seconds high intensity)

20 seconds (10 seconds low intensity + 10 seconds high intensity).

(3) Low MODE exposure at about 35~50% light output of high intensity.

Time selection: **5, 10, 20** seconds

(4) Cycle curing for Orthodontics: at a on/off cycle of high intensity 2,100mW/ cm²



7. Operation Instruction

Activating and Deactivating the Light

- ▶ The light will enter "sleep" mode if the unit has not been used for more than 1 minute, the panel display will turn off to conserve power. If the panel display is not illuminated, simply press on/off button to bring it out of the sleep mode.
- ▶ Activate the light by pressing the on/off button on the keypad.
- ▶ Press the on/off button again to turn off (interrupt) the light before the exposure time is over.

Adjust mode and curing time for the Light

- ▶ Always use the settings recommended by the manufacturer of the dental material when selecting the settings
- ▶ Please refer to Chapter 6.4 for more information of mode selection and curing time setting.
- ▶ Make sure everyone is wearing the appropriate eye protection.

Position the light guide

- ▶ The probe tip shall be used in close proximity to the material to be cured. Avoid actual contact. The flat end of probe should be parallel to the surface being treated.
- ▶ Rotate the light guide into the optimal position for polymerization.
- ▶ Place the light guide as close to the filling material as possible.
Avoid directly contacting the filling material!
- ▶ Keep the light guide clean at all times to obtain full light intensity.
- ▶ Damaged light guides must be replaced immediately, since damaged light guide may strongly reduces light intensity or injures the patient.

Warning signal

- ▶ If the temperature on hand piece is over 50°C, the error code "E2" will show up and buzzer continuously beep 5 tones until the temperature low than 45°C.
- ▶ If the battery voltage runs low, the error code "E1" will show up and buzzer beep continuously 3 tones. Please place handpiece back into charger for recharging.

Note:

- Follow manufacturer's directions for curing times on various materials. It is better to over cure rather than insufficient cure. Over curing should not harm the restoration.
- If the LED remains activated for an extended period, a safety thermostat will cut off the LED to protect curing gun from overheating. Normal usage may then be resumed if the handpiece is idled for an extended period for cooling.

8. Operating Errors And Trouble Shooting

Error	Cause and Solution
1. Can not activate the light and no timer display on handpiece.	<ul style="list-style-type: none">● Battery runs out of power. Please recharge battery, and try again.● If not sure what happen, contact the dealer for further inspection.
2. Error code "E2" shows up and buzzer beeps 5 short tones.	<ul style="list-style-type: none">● Handpiece is overheat, please wait for minutes to have handpiece cooled down. Waiting time can be shortened if handpiece is cooled by compressor air.
3. Error code "E1" shows up and buzzer beeps 3 short tones.	<ul style="list-style-type: none">● Low voltage, battery is run out of power. Please place handpiece back to charging base for recharging.
4. No indicator on charging base.	<ul style="list-style-type: none">● Check the power plug connects to power outlet socket firmly.● If not sure what happen, contact the dealer.
5. Battery working time is significantly shortened.	<ul style="list-style-type: none">● Battery is exhausted after period use (generally two years). Please contact the dealer to replace with a new battery.● If not sure what happen, contact the dealer for further information.

Note: We and our authorized distributors will make available on request circuit diagram, component part lists and other information to assist user's appropriate technical personnel to repair the light cure units which are designated by us as repairable.

9. Measurement of Light intensity

Measurement of Light intensity

Center optic probe on the detecting window which is located on the charging base. Blue LED on indicates light intensity is over 500mW/ cm². If blue LED is still off at intensity measurement, the curing light should not be used. Firstly inspect battery voltage is low or not. If the battery voltage is high, inspect the unit for deterioration of LEDs and light guide at the same time.

10. Cleaning / Disinfecting / Sterilizing



CAUTION.....

- The use of a dry heat oven, incompatible chemical vapor type sterilizing must be avoided as damage can result to the optic fiber and its binding material.
- Do not use any instruments or abrasives on the ends of optic probe loss of light emission may result.

Between Patients:

Probe shall be cleaned free of saliva or dirt prior to sterilizing. The cleaning consists of wiping the surface slightly with a cleansing solution and wiping with a dry cloth. Sterilizing by autoclave is preferred.

Power Unit and Curing Gun



CAUTION.....

- The power unit shall be unplugged before cleaning and disinfecting the power unit and curing gun to prevent from electric shock.
- To wash or spray the out surface of power unit and curing gun with water, cleanser and chemical disinfectant is not allowed for it will result electric shock and damage of inner circuit. If this happens, please contact our dealer for inspection before use.

The cases of power unit and curing gun are made of plastic material Cyclopol. The cleaning consists of wiping the surface slightly with a cleansing solution (Chlorine-releasing compounds). Such as NaClO is not allowed for it will easily make battery charging fail due to metal corrosion) and wiping with a dry cloth. The disinfecting consists of wiping with a cloth slightly dampened with a chemical disinfectant and allows it to remain on the surface for the manufacturer recommended period, but no longer. Then wipe surface with water wet cloth and dry thoroughly including crevices. Appropriate disinfectant information can be obtained from our authorized distributor.

11. Disposal

Follow the national requirement and regulation to dispose of the unit.

As a mean of protection of the environment, your new device is equipped with lithium battery. This kind of battery is free from toxic heavy metal ions. Dispose of battery and units in accordance with local legal regulations.

12. Disclaimer

Vector R & D Inc considers itself responsible for the effects on safety, reliability and performance of this product only if:

- Assembly operations, extensions, re-adjustments, modifications or repairs are carried out by persons authorized by VECTOR R & D INC.
- The electrical installation of the relevant room complies with the requirements.
- The equipment is used in accordance with these instructions for use.

13. Warranty

13.1 Malfunction

Vector R & D Inc hereby warrants that for a period of one year from the delivery date, this device shall be free from defects in material and workmanship. In case the machine is found malfunctioned under normal use, Vector R & D Inc will offer service of free maintenance and parts for replacement.

13.2 Repair

Repairs must be only carried out by an authorized Vector R & D Inc engineer/dealer. If repairs during warranty period are not carried out by an authorized engineer/dealer, warranty will expire immediately.

13.3 Warranty Exception

The warranty stated herein is the sole warranty applicable to Vector R & D Inc products. Vector R & D Inc expressly disclaims the liability for warranty even within warranty period, if

- (1) Damages caused by natural disaster.
- (2) Operator's fault or wrong operation.
- (3) Application use other than curing light-cured material purpose.
- (4) A malfunction or damage caused by repair, adjustment, modification which is not carried out by Vector R & D Inc authorized technicians/dealers.
- (5) A malfunction caused by abnormal power source or voltage.
- (6) It is a consumption part.

(This instruction subjects to change without pre-notice)

