

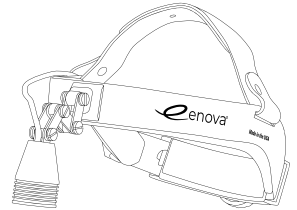
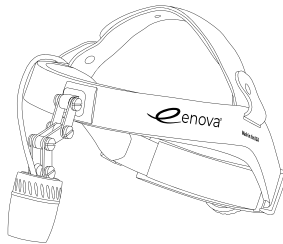
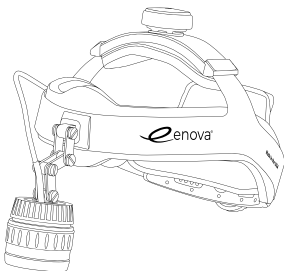


# Enova Illumination

## INSTRUCTIONS FOR USE

LED Surgical Headlights and Battery Packs

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## INTENDED USE

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Enova Illumination LED Surgical Headlight Systems are intended to be used by surgeons, dentists, veterinarians, or other healthcare professionals as an adjunct light source during clinical or surgical procedures in a medical setting. Enova LED headlight output is measured at 14 inches (35cm) and powered using rechargeable lithium-ion battery packs. The pivot bracket allows for the coaxial alignment of the headlight. All Enova headlights and batteries are serialized. The serial number for single ratchet headbands is located on the left side of the headband where the comfort pad attaches to the headband. The serial number for double ratchet headbands is located under the top ratchet comfort pad. The serial number for the batteries is located on the back of the battery.

## WARNINGS AND CAUTIONS

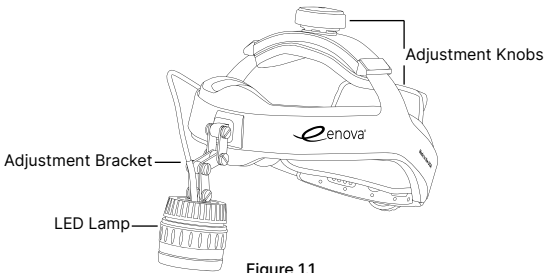
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Before operation, Enova LED Surgical Headlight Systems users should read and understand the operation manual for all the equipment used in conjunction with the headlight. Contact Enova Illumination or your local distributor for service and warranty information.

- DO NOT look directly into the headlight when illuminated. DO NOT shine light directly into the patient's eyes or face. Due to the intensity of light, eye injury may result. The patient's eyes should be appropriately protected in surgeries involving the face or head.
- After a few minutes of operation, the headlamp housing may become warm to the touch. This is normal and functions to dissipate the heat from the LED. Always use a surgical glove or sterile cloth to adjust the angle of the lens when in use.
- Use only Enova supplied batteries and chargers. Using other chargers or batteries may cause fire, explosion, or damage to the battery packs or headlights and void the warranty. The battery pack must be powered off when charging. **DO NOT USE OR STORE A BATTERY CHARGER IN THE OPERATING ROOM OR SURGERY SUITE.**
- All Enova Headlights are wireless. Do not use the headlight while batteries are charging.
- DO NOT use the headlight, batteries, or charger in explosive gas environments.
- DO NOT autoclave, immerse or submerge in liquid, spray with liquids or leave the light on when in the carrying case as it could cause damage to the headlight.
- **DO NOT INTERCHANGE BATTERY CABLES.** Use specified cable for correct headlight; otherwise, the headlight will function abnormally and damage the circuitry causing the light to fail.

# OPERATING HEADLIGHT

1. Fully open the ratchet(s) on the headband before placing the headlight on the head. See Figure 1.1 for features.
2. Adjust the back knob and top knob (or the Velcro strap) to the correct position on the forehead so it fits securely and comfortably around the head.  
**Note:** To avoid “headlight headache,” do not over tighten the back knob. The headlight should fit comfortably, firm but not tight. The weight should rest on the top of the head.
3. Adjust the circumference by turning the knob(s) to tighten or loosen the tension.
4. Position the headlamp co-axially (i.e., centered between and in the alignment with the angle of the eyes). See figure 1.2.
5. Adjust the intensity of the illumination by adjusting the power output on the Power Pack.
6. Adjust the spot size (like a camera lens) by turning the grip ring on the headlamp (excluding fixed spot headlights).



# OPERATING POWER PACKS: PP2, PP4, & FREESTYLE

Power Packs should be fully charged before first use or before any long non-used storage periods. It is recommended to fully charge Power Packs after each use and avoid partial charges. This is not mandatory but will help keep the Power Packs life gauge calibrated and in peak operating condition. Batteries will be shipped to you at 30% charge in accordance with the International Air Transport Association.

1. Connect the cable with the headlight by firmly inserting the end of the cable directly into the receptor cable on the headlight.
2. Connect the cable into the Power Pack by inserting the plug into the receptacle located on the side of the Power Pack. To disconnect the cable from the Power Pack, pull directly out.  
**Note:** Exercise caution when bending, twisting, or folding cables as excessive wear may cause damage to the headlight cable or Power Pack.
3. Press the power button on the Power Pack until the light illuminates (there will be a beep sound; a 1 – second lag is normal).
  - The Power Pack battery life will then be shown on the battery life indicator.
  - To increase the light intensity, press the “+” button.
  - To decrease the light intensity, press the “-” button
  - To turn the Power Pack “OFF” press the ON/OFF button.**Special Note:** The LED indicators on the Power Pack will switch between the light intensity indicators and battery life indicators.
4. If the Power Pack is turned on but not plugged into the headlight, it will turn off automatically after 3 seconds. This is a normal, energy-saving feature.

# BATTERY LIFE STATUS & LOW POWER INDICATIONS

The Power Packs and Freestyle Batteries provide visual and audible signals indicating the power level of the battery. On the Power Packs, the low battery indicator goes through a sequence of 1 to 5 red LEDs. One red indicator light will appear approximately every two minutes, with a beep every minute along with a flashing signal seen in the light output. The Power Pack will power “OFF” approximately one minute after the fifth red indicator light is illuminated. When you notice warning signals, replace the Power Pack with a fully charged one and recharge the low battery to full capacity. On the Freestyle Batteries, there will be auditory beeps once the battery reaches 10% life, accompanied by a flashing signal seen through the light output.

**Note:** these are estimates as the chemistry can fluctuate from battery to battery.

| Power Packs              | 100%           | 95% | 60% | 40% | 20% | 10% | 9 min     | 7 min     | 5 min     | 3 min     | >1 min    |
|--------------------------|----------------|-----|-----|-----|-----|-----|-----------|-----------|-----------|-----------|-----------|
| GREEN SOLID LED Battery  | 1 Center Green | 5   | 4   | 3   | 2   | -   | -         | -         | -         | -         | -         |
| RED Flashing LED Battery | -              | -   | -   | -   | -   | -   | 1         | 2         | 3         | 4         | 5         |
| Audible BEEP Battery     | -              | -   | -   | -   | -   | -   | -         | 1 Beep    | 3 Beeps   | 5 Beeps   | 5 Beeps   |
| Visual Flash Headlight   | -              | -   | -   | -   | -   | -   | 3 Flashes | 3 Flashes | 3 Flashes | 5 Flashes | 5 Flashes |

| Free Style Battery Pack | 100% | 95% | 60% | 40% | 20% | 10% | 9 min | 7 min     | 5 min     | 3 min     | >1 min    |
|-------------------------|------|-----|-----|-----|-----|-----|-------|-----------|-----------|-----------|-----------|
| SOLID LED BATTERY       | 5    | 5   | 3   | 2   | 1   | -   | -     | -         | -         | -         | -         |
| FLASHING LED BATTERY    | -    | -   | -   | -   | -   | 1   | 1     | 1         | 1         | 1         | 1         |
| Audible BEEP Battery    | -    | -   | -   | -   | -   | -   | -     | 2 Beeps   | 3 Beeps   | 4 Beeps   | 5 Beeps   |
| Visual Flash Headlight  | -    | -   | -   | -   | -   | -   | -     | 2 Flashes | 3 Flashes | 4 Flashes | 5 Flashes |

## HEADLIGHT BATTERY CABLE GUIDE

| Q-Series Cool      |                       |                  |                   |
|--------------------|-----------------------|------------------|-------------------|
|                    | Black Extension Cable | Gray Twist Cable | Black Twist Cable |
| XLT-85F            | X                     | -                | X                 |
| Qubit (XLT-105F)   | X                     | -                | X                 |
| XLT-125A           | X                     | -                | -                 |
| XLT-225            | -                     | X                | -                 |
| Qusar (XLT-150A)   | X                     | -                | -                 |
| Quantum (XLT-250A) | -                     | X                | -                 |

| Q-Series Warm      |                       |                  |                   |
|--------------------|-----------------------|------------------|-------------------|
|                    | Black Extension Cable | Gray Twist Cable | Black Twist Cable |
| PLT-60F            | X                     | -                | X                 |
| Qubit (PLT-80F)    | X                     | -                | X                 |
| PLT-100A           | X                     | -                | -                 |
| PLT-165A           | -                     | X                | -                 |
| Qusar (PLT-115A)   | X                     | -                | -                 |
| Quantum (PLT-175A) | -                     | X                | -                 |

# BATTERY CHARGER

Enova offers three styles of chargers, PP-Single Charger, PP-Base Station compatible with the PP2 and PP4 Power Packs, and Freestyle Base Station compatible with Freestyle Batteries.

## PP-Single Charger

- Power Packs must be turned off before connecting to the charger.
- Plug the power cord from the charging unit into the wall outlet. The charger will show a green light when plugged into the wall.
- Plug the small charging cord that leads from the charger into the Power Pack. Both chargers will show a red light while the battery pack is charging. Toward the end of the charging cycle, the charger LED will intermittently change between red and green.
- When the battery is fully charged, the light on the charger will appear solid green.

Note: the center green light on the power packs will be constantly illuminated, indicating the battery is 100% charged.

- Remove the Power Pack from the charger and wait approximately 5 seconds before turning it on.

## PP-Base Station and Freestyle Base Station

- Power Packs must be turned off before connecting to the charger.
- Plug PP-Base Station into AC outlet.
- Charging status is shown with 5 green LED lights on top of the Power Pack. Green lights will blink while charging.
- If the Power Pack is fully drained, 1 green light on it will flash.
- As the power Pack approaches full charge, additional green blinking lights will illuminate until 5 green blinking lights are shown, indicating the battery is 95% charged.
- The Center Green Light on battery will be constantly illuminated on the Power Packs, indicating the battery is 100% charged. All five green light indicators will be constantly illuminated on Freestyle batteries, indicating it is 100% charged.
- Remove the Power Pack from the charger and wait approximately 5 seconds before turning it on.

| Chargers               |   |                           |             |             |
|------------------------|---|---------------------------|-------------|-------------|
|                        | Power Cord Options                      | Input                     | Output      | Charge Time |
| PP-Single Charger      | North American, Euro, UK, and Australia | 100-240V<br>50/60 Hz 1.5A | 10V<br>1.6A | 3-4 hours   |
| PP-Base Station        | North American, Euro, UK, and Australia | 100-240V<br>50/60 Hz 1.5A | 10V<br>1.6A | 4-8 hours   |
| Freestyle Base Station | North American, Euro, UK, and Australia | 100-240V<br>50/60 Hz 1.5A | 12V<br>2.0A | 4-6 hours   |

# SPECIFICATIONS

## Environment

| Product    | Storage                       | Operating                  |
|------------|-------------------------------|----------------------------|
| Headlight  | 40°F (5°C) to 122°F (50°C)    | 50°F (10°C) to 85°F (30°C) |
| Power Pack | 40°F (5°C) to 122°F (50°C)    | 50°F (10°C) to 85°F (30°C) |
| Charger    | -22°F (-30°C) to 185°F (85°C) | 32°F (0°C) to 104°F (40°C) |

## Headlight Measurements

| Adjustable Lens         |                           |           |                               |     |
|-------------------------|---------------------------|-----------|-------------------------------|-----|
| Headlight               | Spot Size at 14 in (35cm) |           | Lux Intensity at 14 in (35cm) | CRI |
|                         | Min                       | Max       | Max Intensity                 |     |
| PLT-100A                | 2" (5 cm)                 | 5" (12cm) | 90,000 lux                    | 90  |
| Quasar Warm (PLT-100A)  | 2" (5 cm)                 | 5" (12cm) | 115,000 lux                   | 90  |
| XLT-125A                | 2" (5 cm)                 | 5" (12cm) | 125,000 lux                   | 70  |
| Quasar Cool (XLT-150A)  | 2" (5 cm)                 | 5" (12cm) | 150,000 lux                   | 70  |
| QuantumWarm (PLT-175A)  | 2" (5 cm)                 | 4" (10cm) | 175,000 lux                   | 90  |
| Quantum Cool (XLT-250A) | 2" (5 cm)                 | 4" (10cm) | 250,000 lux                   | 70  |

| Fixed Lens             |                           |            |                               |      |
|------------------------|---------------------------|------------|-------------------------------|------|
| Headlight              | Spot Size at 14 in (35cm) |            | Lux Intensity at 14 in (35cm) | *CRI |
|                        | Inches                    | Min        | Max                           |      |
| PLT-60F                | 2" (5 cm)                 | 15,00 lux  | 60,000 lux                    | 90   |
| Qubit Warm (PLT-80F)   | 2" (5 cm)                 | 20,000 lux | 80,000 lux                    | 90   |
| XLT-85F                | 2" (5 cm)                 | 30,000 lux | 85,000 lux                    | 70   |
| Quasar Cool (XLT-105F) | 2" (5 cm)                 | 40,000 lux | 105,000 lux                   | 70   |

\*CRI color rendering index is a quantitative measure of the ability to reveal the colors of various objects faithfully in comparison with an ideal or natural light source

## Power Packs Operating Time

| Headlight    | PP2 Intensity |         | PP4 Intensity |         | Freestyle Intensity |          |
|--------------|---------------|---------|---------------|---------|---------------------|----------|
|              | Max 100%      | Min 30% | Max 100%      | Min 30% | Max 100%            | Min 100% |
| PLT-60F      | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| XLT-85F      | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| Qubit Warm   | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| Qubit Cool   | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| PLT-100A     | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| XLT-125A     | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| Quasar Warm  | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| Quasar Cool  | 5 hrs         | 10 hrs  | 11 hrs        | 24 hrs  | 3.5 hrs             | 7 hrs    |
| PLT-165A     | N/A           | N/A     | 5 hrs         | 10 hrs  | N/A                 | N/A      |
| XLT-225      | N/A           | N/A     | 5 hrs         | 10 hrs  | N/A                 | N/A      |
| Quantum Warm | N/A           | N/A     | 5 hrs         | 10 hrs  | N/A                 | N/A      |
| Quantum Cool | N/A           | N/A     | 5 hrs         | 10 hrs  | N/A                 | N/A      |

## Specifications

|        |               | PP2       | PP4       | Freestyle |
|--------|---------------|-----------|-----------|-----------|
| Input  | Volts         | 10        | 10        | 7.2       |
| Output | Volts         | 3.5 - 3.7 | 3.5 - 3.7 | 3.5 - 3.7 |
|        | Miliamp hours | 5,000     | 10,000    | 1,540     |
|        | Watt Hours    | 18.5      | 37        | 11.08     |

# WARRANTY, SERVICE, AND RETURNS

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## Scope of Warranty

The limited warranty covers the replacement of parts, repairs, and associated labor. Except as otherwise set forth herein, Enova shall not be liable or responsible for any other actions or damages (special consequential or incidental) related to the products set forth herein. The purchaser is responsible for the return of the product to Enova or an authorized distributor and bears the costs of shipping and insurance. All Enova products carry a 30-day money-back policy. Please review the full scope of the warranty on the Enova's website.

## Warranty Terms

All Enova products are warranted to be free of original defects in material and workmanship and to perform under specifications articulated in this manual for these terms from the date of purchase

- Lamp and LED – 5-year limited warranty
- Batteries and charger – 1-year limited warranty
- Headbands and lamp attachment mechanism – 1-year limited warranty
- Cords, cables, connectors and accessories – 1 year limited warranty

Note: All warranties are conditioned upon the use of the products under normal conditions and when used solely for the intended purpose (i.e. medical use in a medical setting). We reserve the right to determine the cause of breakage or failure of all the terms.

## Limitations of Warranty

This warranty is void and does not apply if:

- The headlight is not used per Enova's instructions, recommendations, or in a setting/manner outside of its intended use.
- The headlight is repaired or serviced by someone other than Enova, Enova Distributors, or an Enova authorized representative.
- The headlight is used with or powered by batteries or battery chargers other than authentic and authorized Enova accessories or parts.
- Damage caused due to accidental damage, tampering, misuse, neglect, improper shipping or packaging, or excessive wear and tear.

## Return and Service

We accept all returns if they are shipped (insured) within 30 days of receiving the light and are returned in acceptable condition. The warranty does not cover damages incurred during return shipment due to improper packaging. Shipping costs are not covered by any policies and are the responsibility of the purchaser.

For all returns, warranty, and service issues, please follow these steps:

1. Contact Enova to discuss the problem you are experiencing.
2. Receive an RMA (Return Material Authorization) tracking number
3. Arrange payment for repairs and service outside of the warranty parameters. Please provide the unit's serial number, your return shipping address, email and daytime telephone number.

Once the repair is complete, payment is charged using VISA, MasterCard, American Express, Purchase Order, or check. Ship the unit insured to Enova. Please reference your RMA number on your shipping statement. Securely package unit and ship it insured to:

Enova Illumination  
Atten: RMA#  
1717 Broadway St NE  
Minneapolis, MN 55413

*For international customers, please contact your authorized sales representative. For US customers, please contact Enova Customer Service (sales@goenova.com) or call 1.651.236.8857.*

# CLEANING, STORAGE, AND MAINTENANCE

Exterior surfaces of the headlight, headband, comfort pads, power pack, charger cables, and cords can be cleaned using a gauze pad or cotton swab moistened with **70% isopropyl alcohol** or mild soap. After cleaning, wipe the area with a lint-free soft cloth moistened with water to remove any residue from cleaning products.

DO NOT immerse or spray the headlight, battery pack or charger with disinfecting liquids or sterilizer, nor should any liquids be poured on the lens, lens housing or cable connectors. Make sure no liquid comes in contact with the headlight, electrical connectors, charger or battery packs.

To ensure long life of the headlight, battery packs, and chargers, Enova recommends storing them in the carrying case.

Enova recommends daily recharging of the battery pack with the supplied battery charger to prepare for subsequent usage. Enova recommends disconnecting the battery packs from the charger after fully charged.

For proper hygiene, it is recommended to replace the comfort pads every 3-6 months. Users may order additional comfort pads from Enova for your local distributor. All Enova comfort pads are treated with Aegis® microban protection.

Lens: avoid scratching or striking the front lens as a reduction in light transmission may occur.

## SYMBOLS LEGEND

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Manufactured  
Date



Manufactured  
By



Caution



Part Number



Follow Instructions  
for Use



Conformite Europeenee/  
European Conformity



Recycle



Authorized Representative  
in European Community

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To learn more about how Enova can help you see better, so you can perform better, visit [www.goenova.com](http://www.goenova.com), call 651.236.8857, or email [sales@goenova.com](mailto:sales@goenova.com).

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