



TECHNICAL PUBLICATIONS

# Overview

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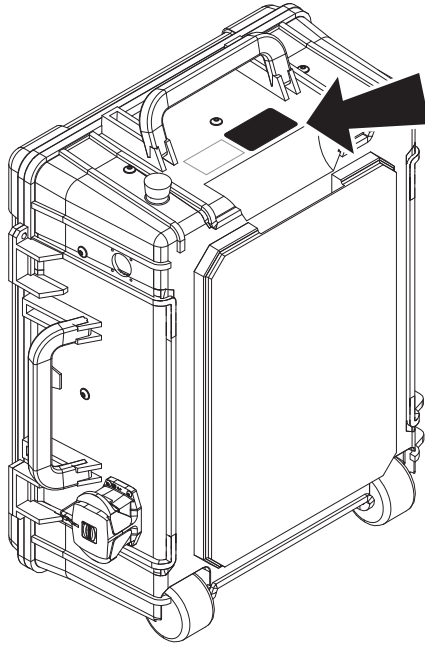
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## Serial Number Location

Record serial numbers and date of purchase in spaces provided.



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Model Number	
Serial Number	
Date of purchase	

## **Intended Use**

The Bluelight LED CIPP Lining System is intended to cure liners for use in cured in place pipe (CIPP) operations lining laterals, small wastewater pipes, and conduit. It is designed to cure liners of diameter 3-12in (7.62-30.48cm) for distances of up to 165ft (50m).

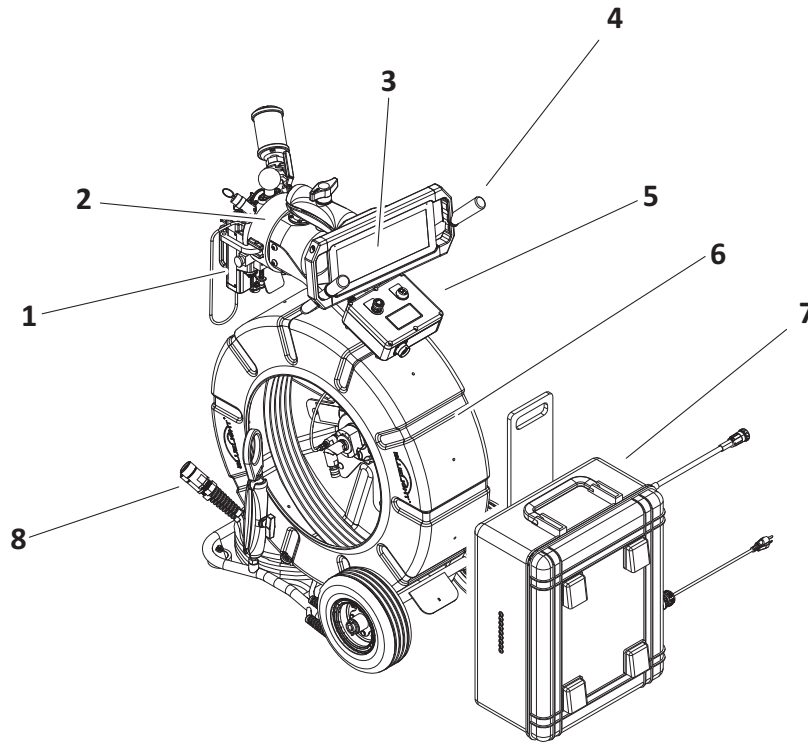
The machine is designed for operation in temperatures from 32° to 77° F (0° to 25° C). Contact your HammerHead® dealer for provisions required for operating in extreme temperatures. Use in any other way is considered contrary to the intended use.

The Bluelight system should be operated, serviced, and repaired only by persons familiar with its particular characteristics and acquainted with the relevant safety procedures.

## **Equipment Modification**

This equipment was designed and built in accordance with applicable standards and regulations. Modification of equipment could mean that it will no longer meet regulations and may not function properly or in accordance with the operating instructions. Modification of equipment should only be made by competent personnel possessing knowledge of applicable standards, regulations, equipment design functionality/requirements and any required specialized testing.

## Machine Components



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- |                                    |                    |
|------------------------------------|--------------------|
| 1. Light head                      | 5. Handles         |
| 2. Propulsion unit                 | 6. Junction box    |
| 3. Camlock                         | 7. Drum            |
| 4. Display/Touch screen controller | 8. Power converter |

## **Electromagnetic Compatibility Statement**

### **U.S.**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by **The Charles Machine Works, Inc.** could void the user's authority to operate the equipment.

FCC 15.107:2019 Class A (conducted emissions)

FCC15.109:2019 Class A (radiated emissions)

### **Canada**

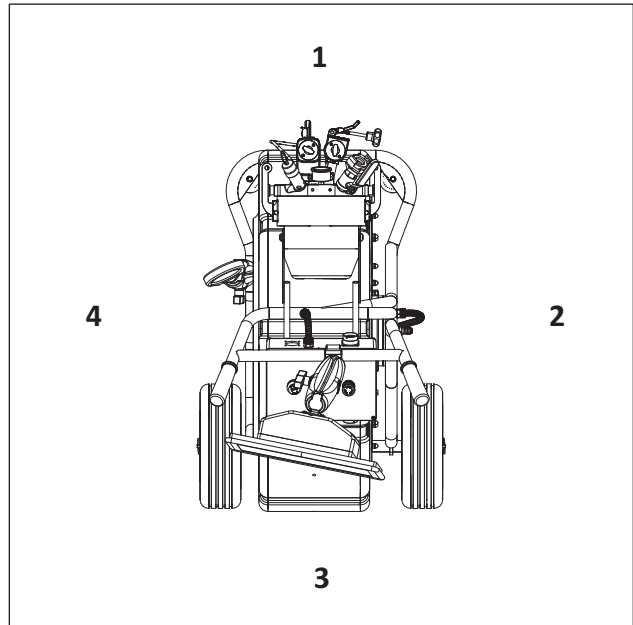
CAN ICES-3(A)/NMB-3(A)

ICES-003:2016 updated April 2017 Class A (radiated and conducted emissions)

## Operator Orientation

**IMPORTANT:** Top view of machine is shown.

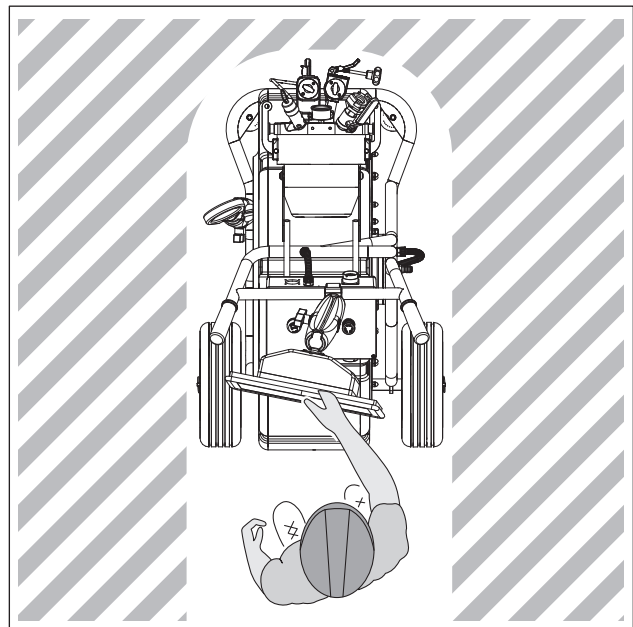
1. Front
2. Right side
3. Rear
4. Left side



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## Operating Area

Operate within easy access of controls.



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## **About This Manual**

This manual contains information for the proper use of this machine. Cross references such as “See page 50” will direct you to detailed procedures.

### **Bulleted Lists**

Bulleted lists provide helpful or important information or contain procedures that do not have to be performed in a specific order.

### **Numbered Lists**

Numbered lists contain illustration callouts or list steps that must be performed in order.





## Foreword

This manual is an important part of your equipment. It provides safety information and operation instructions to help you use and maintain your HammerHead® equipment.

Read this manual before using your equipment. Keep it with the equipment at all times for future reference. If you sell your equipment, be sure to give this manual to the new owner.

If you need a replacement copy, contact your HammerHead dealer. If you need assistance in locating a dealer, visit our website at **[www.hammerheadtrenchless.com](http://www.hammerheadtrenchless.com)** or write to the following address:

HammerHead Trenchless Equipment  
500 South C.P. Avenue  
Lake Mills, WI 53551  
USA

The descriptions and specifications in this manual are subject to change without notice. Earth Tool Company LLC reserves the right to improve equipment. Some product improvements may have taken place after this manual was published. For the latest information on HammerHead equipment, see your HammerHead dealer.

Thank you for buying and using HammerHead equipment.



A CHARLES MACHINE WORKS COMPANY

***Bluelight LED Curing System  
Operator's Manual***

**Issue number 1.0/OM-7/21**

**Part number 934-0900**

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by Earth Tool Company LLC**



HammerHead is a registered trademark of Earth Tool Company LLC.

This product and its use may be covered by one or more patents at <http://patents.charlesmachine.works>.

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# Safety

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## Safety Alert Classifications

These classifications and the icons defined on the following pages work together to alert you to situations which could be harmful to you, jobsite bystanders or your equipment. When you see these words and icons in the book or on the machine, carefully read and follow all instructions. **YOUR SAFETY IS AT STAKE.**

Watch for the three safety alert levels: **DANGER**, **WARNING** and **CAUTION**. Learn what each level means.

 **DANGER** indicates a hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

 **WARNING** indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 **CAUTION** indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Watch for two other words: **NOTICE** and **IMPORTANT**.

**NOTICE** indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

**IMPORTANT** can help you do a better job or make your job easier in some way.

## Guidelines



### **WARNING**

Misuse of machine can cause death or serious injury. Read and understand operator's manual and all other safety instructions before use. Know how to use all controls.



When you see this safety alert sign, carefully read and follow all instructions.

**YOUR SAFETY IS AT STAKE.** Read this entire section before using your equipment.  
**SAVE THESE INSTRUCTIONS.**

Follow these guidelines before operating any jobsite equipment.

- Complete proper training and read operator's manual before using equipment.
- Mark proposed path with white paint and have underground utilities located before working. In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service. In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.
- Classify jobsite based on its hazards and use correct tools and machinery, safety equipment, and work methods for jobsite.
- Mark jobsite clearly and keep spectators away.
- Wear personal protective equipment including long pants, hard hat, eye protection, hearing protection, and protective footwear.
- Do not wear jewelry or loose clothing.
- Review jobsite hazards, safety and emergency procedures, and individual responsibilities with all personnel before work begins. Safety Data Sheets (SDS) are available at [www.hammerheadshop.com/resources/technical-sheets/](http://www.hammerheadshop.com/resources/technical-sheets/).
- Fully inspect equipment before operating. Repair or replace any worn or damaged parts. Replace missing or damaged safety shields, safety signs, and decals. Contact your HammerHead dealer for assistance.
- Use equipment carefully. Stop operation and investigate anything that does not look or feel right.
- Do not operate unit where flammable gas, liquid, or dust may be present.
- Only operate equipment in well-ventilated areas.
- Contact your HammerHead dealer if you have any question about operation, maintenance, or equipment use.
- To reduce risk of injury, close supervision is necessary when a product is used near children.
- Know how to stop the product and bleed pressures quickly.
- Stay alert — watch what you are doing.
- Do not operate product when fatigued or under the influence of alcohol or drugs.
- Do not overreach or stand on unstable support. Keep good footing and balance at all times.
- To disconnect, turn all controls to the off ("O") position, then remove plug from outlet.



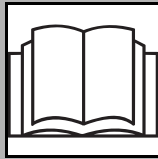
## ***Bluelight LED Curing System Operator's Manual***

### ***Guidelines***

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- Do not unplug by pulling on cord. To unplug, grasp the plug, not the cord.
- Unplug from outlet when not in use and before servicing or cleaning.
- For a grounded appliance, connect to a properly grounded outlet only. See grounding instructions.
- Do not expose machine to rain or wet conditions. Water entering a power tool will increase the risk of electric shock.
- Store machine out of the reach of children.
- Do not allow persons unfamiliar with machine to operate.
- Do not let familiarity gained from frequent use of machine to allow you to become complacent and ignore tool safety principles.
- Remove any adjusting key or wrench before turning machine on.
- Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges, and refrigerators.
- Do not force the power tool. Use the correct power tool for your application.
- Do not use machine if remote shutdown switch does not turn it on and off.

## Grounding Instructions

**⚠ DANGER**

Electric shock. Improper connection of equipment-grounding conductor will cause death or serious injury. Contact qualified electrician to ensure outlet is properly grounded.

**To help avoid injury:**

- Never modify plug provided with product. If plug will not fit outlet, have a proper outlet installed by a qualified electrician.
- Never use an adapter.
- Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the appliance is properly grounded.

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce risk of electric shock. This product is equipped with a cord with equipment-ground and a grounding plug (shown). The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

## Emergency Procedures



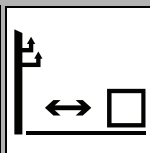
**⚠ WARNING**

Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

Before operating any equipment, review emergency procedures and check that all safety precautions have been taken.

**EMERGENCY SHUTDOWN** - Turn ignition switch to stop position or push remote engine stop button (if equipped).

## Electric Strike Description



**⚠ DANGER**

Electric shock. Contacting electric lines will cause death or serious injury. Know location of lines and stay away.

When working near electric cables, remember the following:

- Electricity follows all paths to ground, not just path of least resistance.
- Pipes, hoses, and cables will conduct electricity back to all equipment.
- Low voltage current can injure or kill. Many work-related electrocutions result from contact with less than 440 volts.

Most electric strikes are not noticeable, but indications of a strike include:

- power outage
- smoke
- explosion
- popping noises
- arcing electricity

**If any of the occur, assume an electric strike has occurred.**

## If an Electric Line is Damaged

If you suspect an electric line has been damaged, **DO NOT MOVE**. Take the following actions. The order and degree of action will depend on the situation.

- If you are in pit:

- DO NOT TOUCH ANYTHING.
- Remain in pit.
- Warn people nearby that an electric strike has occurred. Instruct them to leave the area and contact utility.
- Contact utility company to shut off power.
- Do not leave pit until given permission by utility company.
- If you are out of pit:
  - DO NOT TOUCH ANY EQUIPMENT.
  - LEAVE AREA. The ground surface may be electrified, so take small steps with feet close together to reduce the hazard of being shocked from one foot to the other.
  - Contact utility company to shut off power.
  - Do not return to jobsite or allow anyone into area until given permission by utility company.
- If you are on another piece of equipment:
  - Warn people nearby that an electric strike has occurred. Instruct them to leave the area and contact utility.
  - Contact utility company to shut off power.
  - Do not return to area or allow anyone into area until given permission by utility company.

### **If a Gas Line is Damaged**

If you suspect a gas line has been damaged, take the following actions. The order and degree of action will depend on the situation.

- Immediately shut off engine(s), if this can be done safely and quickly.
- Remove any ignition source(s), if this can be done safely and quickly.
- Warn others that a gas line has been cut and that they should leave the area.
- After warning others to leave the area, leave jobsite as quickly as possible.
- Immediately call your local emergency phone number and utility company.
- If jobsite is along street, stop traffic from driving near jobsite.
- Do not return to jobsite until given permission by emergency personnel and utility company.

### **If a Fiber Optic Cable is Damaged**

Do not look into cut ends of fiber optic or unidentified cable. Vision damage can occur. Contact utility company.

### **If Machine Catches on Fire**

Perform emergency shutdown procedure and then take the following actions. The order and degree of action will depend on the situation.

- Immediately move battery disconnect switch (if equipped and accessible) to disconnect position.

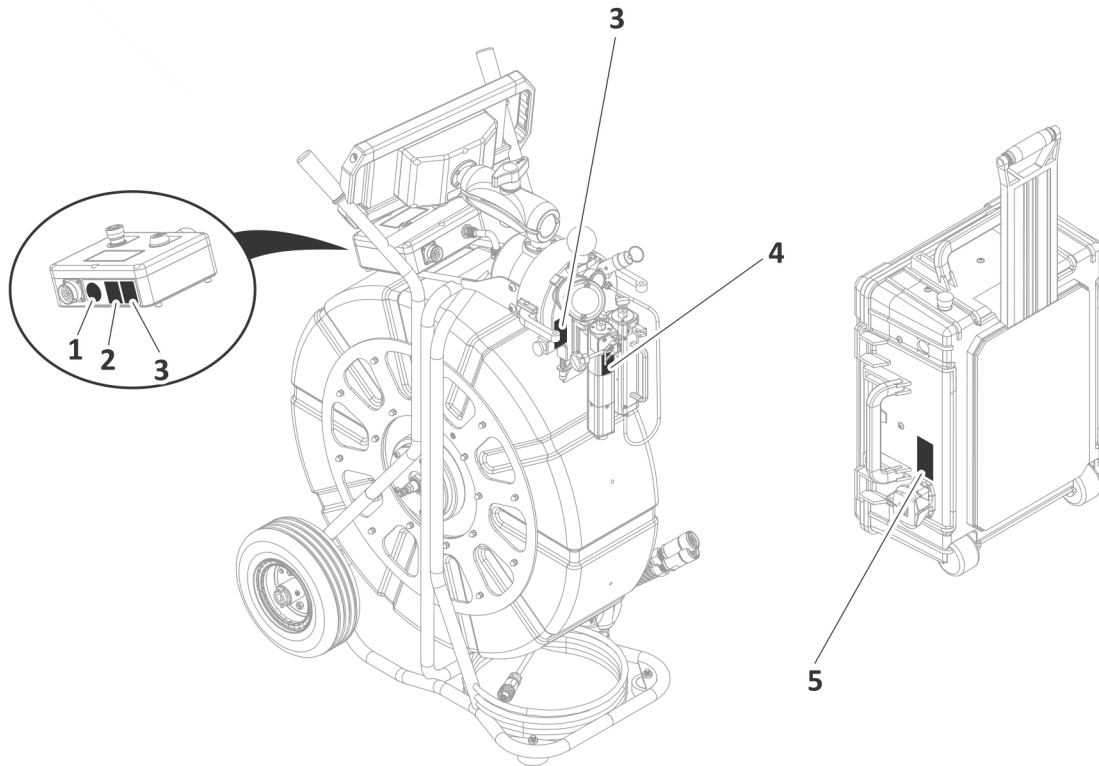
## ***Bluelight LED Curing System Operator's Manual***

### ***Emergency Procedures***

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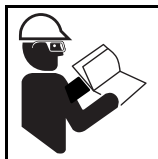
- If fire is small and fire extinguisher is available, attempt to extinguish fire.
- If fire cannot be extinguished, leave area as quickly as possible and contact emergency personnel.

## Machine Safety Alerts



Decal\_HH\_Bluelight.png

1



Read operator's manual. Follow safety rules and know how to use all controls. Your safety is at stake.

2



**CAUTION** High noise levels. Exposure can cause hearing loss. Wear hearing protection.

3



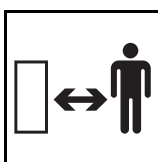
**WARNING** Visible radiation. Exposure can cause serious injury. Do not look at operating lamp. Wear proper personal protective equipment.

## Bluelight LED Curing System Operator's Manual

### Machine Safety Alerts

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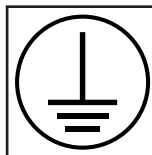
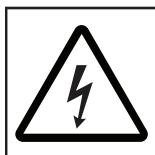
4



**⚠ WARNING**

Moving parts. Contact can cause serious injury.  
Stay away.

5



**⚠ DANGER**

Connected electrical equipment. Contact will  
cause death or serious injury. Only use in a dry and protected  
environment with a properly grounded power source.

# Controls

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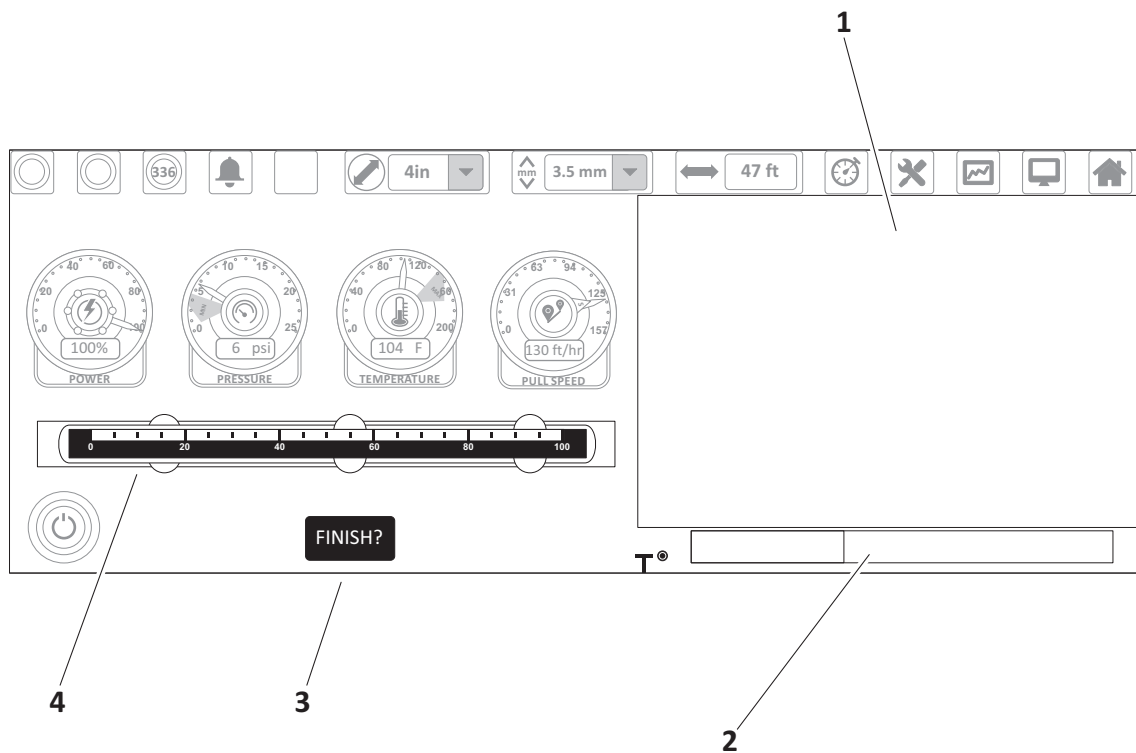
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**Display**

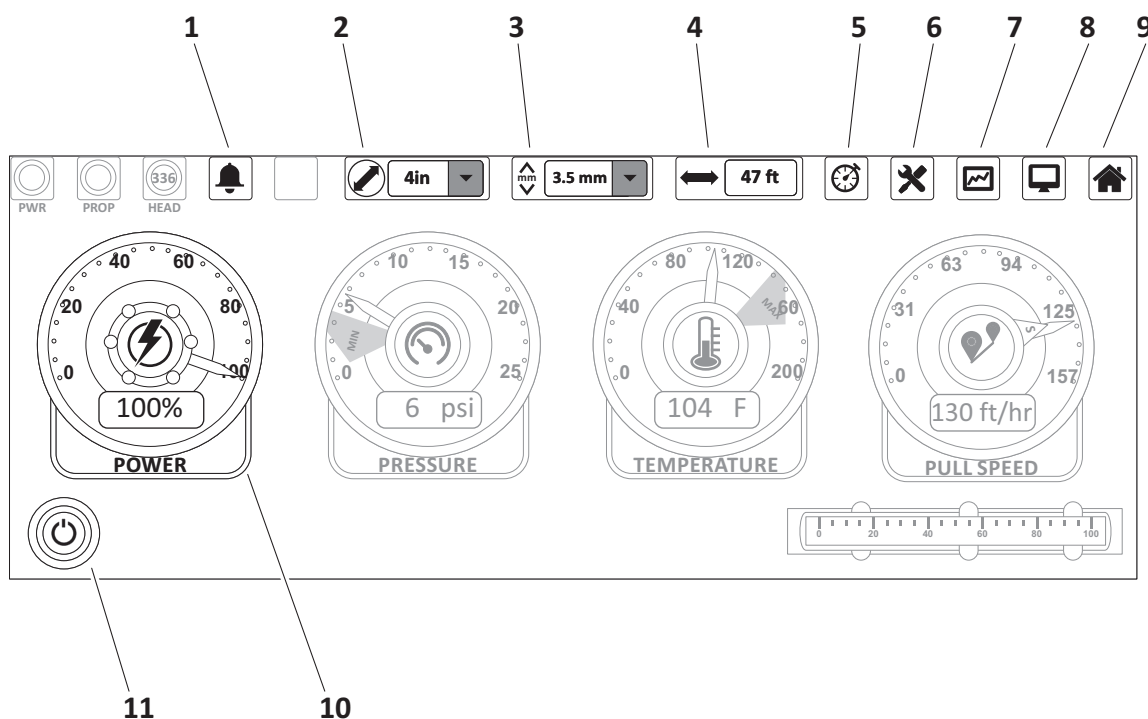
**Alternate View**



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Item	Description	Notes
1. <b>Camera/Plot view</b>	Displays camera or plot of curing process.	When in camera view, camera can be made full screen.
2. <b>Message view</b>	Displays alert messages.	
3. <b>Progress bar</b>	Displays percentage of job completed.	
4. <b>Finish</b>	To end cure after pausing, press.	Button appears when curing process is paused. See “Power/Pause” on page 26.

### Display Commands



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- |                 |                               |
|-----------------|-------------------------------|
| 1. Alarm        | 7. Plots                      |
| 2. Liner size   | 8. Camera                     |
| 3. Liner weight | 9. Home                       |
| 4. Liner length | 10. Power level control/gauge |
| 5. Timer        | 11. Power/Pause               |
| 6. Tools        |                               |

Item	Description	Notes
1. Alarm	To show alarm information, press.	
2. Liner size	To enter liner size, press.	
3. Liner weight	To enter liner weight, press.	
4. Liner length	To enter liner length, press.	
5. Timer	To display timer function, press.	Display will show timer options. Set as needed.
6. Tools	To access tools screen, press.	See "Tools Menu" on page 26.

## **BlueLight LED Curing System Operator's Manual**

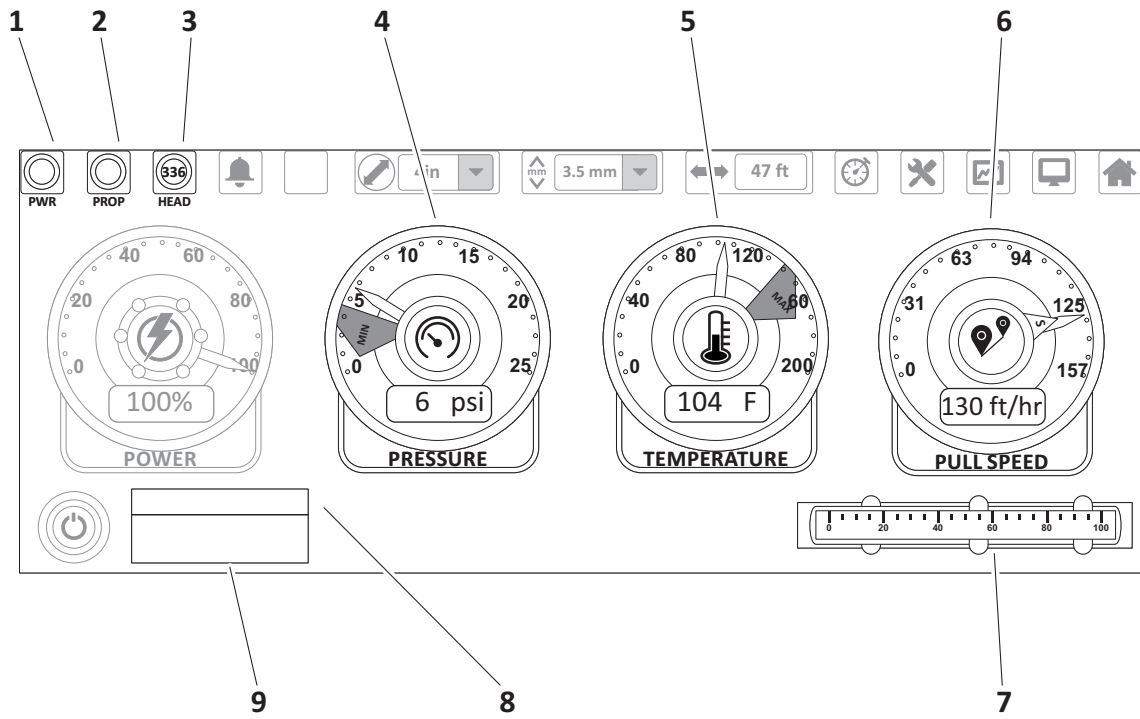
### **Display**

<b>Item</b>	<b>Description</b>	<b>Notes</b>
<b>7. Plot</b>	To access plot view, press.	
<b>8. Camera</b>	To access camera view, press.	
<b>9. Home</b>	To return to home view, press.	
<b>10. Power level control/gauge</b>	To set power level, press percentage.  Displays power level.	When using the 15A/120Vac power plug and 696 light head, power will be limited to 75%.
<b>11. Power/Pause</b>	To power the light head, press.  To pause cure, press.  To continue, press.	

### **Tools Menu**

<b>Item</b>	<b>Description</b>	<b>Notes</b>
<b>Setup</b>	To customize settings, select.	Language, units of measurement, time, dwell time entry, and pressure bypass can be adjusted in this screen.
<b>Power</b>	To monitor or adjust power, select.	Displays information on light head failures.
<b>Alarms</b>	To view alarm information, select.	
<b>Power Supply Interface</b>	For use only by qualified technicians.	
<b>Testing</b>	For use only by qualified technicians.	

### Indicators



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- |                                  |                  |
|----------------------------------|------------------|
| 1. Converter power               | 6. Pull speed    |
| 2. Propulsion unit communication | 7. Progress bar  |
| 3. Light head communication      | 8. System status |
| 4. Pressure                      | 9. Cure status   |
| 5. Temperature                   |                  |

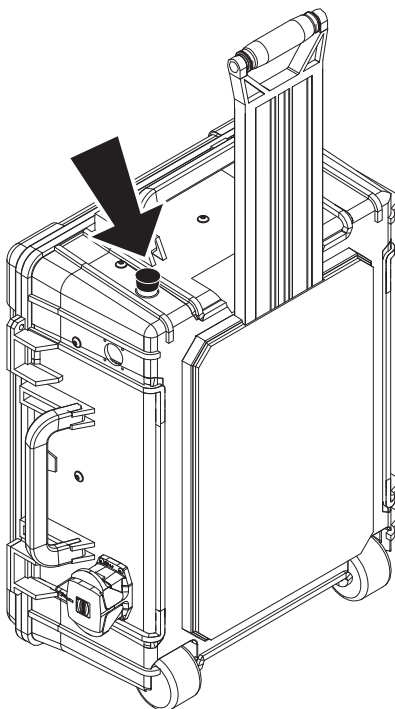
Item	Description	Notes
1. Converter power	Lights when power converter communication link is active.	If indicator does not light after 30 seconds: <ul style="list-style-type: none"> <li>Unplug the system.</li> <li>Ensure control cables are connected.</li> <li>Plug in system.</li> </ul>
2. Propulsion unit communication	Lights when propulsion unit communication link is active.	If indicator does not light after 30 seconds, check cable between trolley and propulsion unit.

## Bluelight LED Curing System Operator's Manual

### Display

Item	Description	Notes
3. Light head communication	Lights when light head communication link is active.	Displays light head model number. If indicator does not light after 30 seconds, check connection at trolley hub.
4. Pressure	Displays air pressure in liner.  To display pressure in psi or bar, press center number.	<b>NOTICE:</b> Pressure must be kept at a minimum of 4.5psi (0.31bar).  Green center indicates pressure OK.  Red center indicates high or low pressure.  See "Air pressure gauge" on page 30.
5. Temperature	Displays light head temperature.  To display temperature in Fahrenheit or Celsius, press center number.	Maximum light head temperature is 150°F (65.6°C).  Green center indicates system is functioning as expected.  Red center indicates high temperature. System will shut down when temperature limit is exceeded.
6. Pull speed	Displays pull speed.  To select pull speed units, press center number.	Green arrow displays set speed.  Orange needle indicates actual speed.  Green center indicates system is functioning as expected.  Flashing red center indicates system is checking speed.  Red center indicates system error. System will shut down after 5 seconds.
7. Progress bar	Displays percentage of job completed.	
8. System status	Displays messages for system status.	See "Troubleshoot System" on page 47.
9. Cure status	Displays time and remaining distance of cure.	

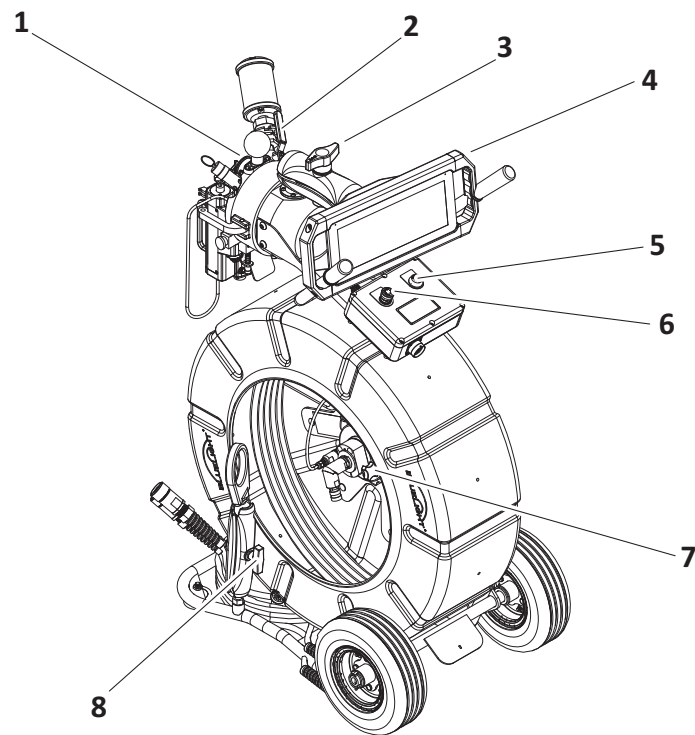
## Power Converter



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Item	Description	Notes
Remote stop button	To stop power to light head and motor movement, press.	

# Trolley



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1. Air pressure gauge

2. Air valve

3. Display position control

4. Display/Touch screen controller
5. Alarm

6. Stop button

7. Drum brake

8. Guide ring position control

Item	Description	Notes
1. Air pressure gauge	Displays pressure.	
2. Air valve	To open, move left.  To close, move right.	
3. Display position control	To loosen and remove display, move left.  To secure display, mover right.	

Item	Description	Notes
<b>4. Display/Touch screen controller</b>	Displays graphic symbols for indicators and conditions.  Allows access to machine controls.	See "Display" on page 24.  See "Display Commands" on page 25.
<b>5. Alarm</b>	Sounds when 3ft (0.9m) remains in job.  Sounds when timer function is used.  Sounds when an error occurs.	Alarm will sound for 1 minute.
<b>6. Stop button</b>	To stop machine, press.	
<b>7. Drum brake</b>	To prevent drum rotation, turn right.  To enable rotation, turn left.	
<b>8. Guide ring position control</b>	To adjust position, move left.  To lock in place, move right.	





# Prepare

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## **Gather Information**

A successful job begins before you dig. The first step in planning is reviewing information already available about the job and jobsite.

### **Review Job Plan**

Review blueprints or other plans. Check for information about existing or planned structures, elevations, or proposed work that may be taking place at the same time.

### **Notify One-Call Services**

Mark proposed path with white paint and have underground utilities located before working.

- In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service.
- In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.

### **Examine Product Material**

Ask for a sample of the new product material you will be installing. Check its weight and stiffness.

### **Arrange for Traffic Control**

If working near a road or other traffic area, contact local authorities about safety procedures and regulations.

### **Plan for Emergency Services**

Have the telephone numbers for local emergency and medical facilities on hand. Check that you will have access to a telephone.

## Inspect Site

- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Mark proposed path with white paint and have underground utilities located before working. In the US or Canada, call 811 (US) or 888-258-0808 (US and Canada). Also contact any local utilities that do not participate in the One-Call service. In countries that do not have a One-Call service, contact all local utility companies to have underground utilities located.
- Inspect jobsite and perimeter for evidence of underground hazards, such as:
  - “Buried utility” notices
  - Utility facilities without overhead lines
  - Gas or water meters
  - Junction boxes
  - Drop boxes
  - Light poles
  - Manhole covers
  - Sunken ground
- Mark location of all buried utilities and obstructions.

## Prepare Jobsite



**⚠ WARNING** Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

**To help avoid injury:** All vegetation near operator's station must be removed. Contact with trees, shrubs, or weeds during electrical strike could result in electrocution.

- Ensure area where machine will be operated is on level and firm ground.
- Clear selected area 3' (0.9 m) around and 20' (6.1 m) above unit.
- Ensure work area is clean and well lit. Cluttered or dark areas invite accidents.

## Prepare Equipment

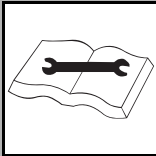

### Check Supplies

- personal protective equipment, such as hard hat and safety glasses
- resin
- portable generator/on site electrical supply
- hoses
- 60ft<sup>3</sup>/min (1.7m<sup>3</sup>/min) dried and chilled air supply

### Check Equipment

#### Condition and Function

- all controls



**WARNING** Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.

- couplers and fittings
- hoses and valves
- rollers

### Assemble Accessories

#### Fire Extinguisher

If required, keep a fire extinguisher near the power unit but away from possible points of ignition. The fire extinguisher should always be classified for both oil and electrical fires. It should meet legal and regulatory requirements.

# Operate

## Chapter Contents

**Move Machine . . . . . 38**

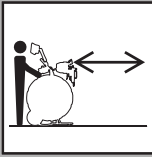
**Set Up and Configure . . . . . 39**

- Install Drum . . . . .40
- Connect Electrical Cables . . . . .40
- Connect Air Hoses . . . . .41
- Attach Light Head . . . . .41
- Check Connections . . . . .41
- Connect Liner . . . . .41

**Operate . . . . . 42**

**Shut Down . . . . . 43**

## Move Machine



**⚠ WARNING**

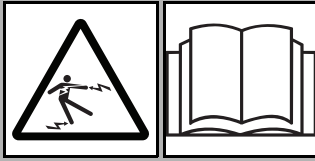
Tipover possible. Machine can tip over and crush you.

**To help avoid injury:**

- Move at slow speed.
- Use both hands.
- Do not tip unit back past 20°.
- Keep handles and grasping surfaces dry, clean, and free from oil and grease.
- For machine weight, see “Specifications” on page 59.

To move machine, place foot on footpad at axle of trolley and pull back on handles at top of unit.

## Set Up and Configure

**⚠ DANGER**

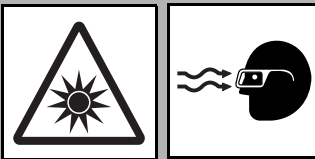
Electrical supply. Shock will cause death or serious injury. Only use in a dry and protected environment with a properly grounded power source.

**⚠ WARNING**

Jobsite hazards. Exposure can cause death or serious injury. Use correct equipment and work methods. Use and maintain appropriate safety equipment.

**To help avoid injury:**

- Wear personal protective equipment including hard hat, safety eye wear, foot protection, hearing protection, and gloves (except when near rotating equipment).
- Remove jewelry.
- Wear close-fitting, high visibility clothing.
- Have other personal protective equipment, such as insulated boots and gloves, breathing protection, and face shield, etc. available for use depending on jobsite hazards or requirements.

**⚠ WARNING**

Visible radiation. Exposure can cause serious injury. Do not look at operating lamp. Wear proper personal protective equipment.

**To help avoid injury:**

- Wear protective glasses or goggles rated for high intensity blue light.
- Cover windows on inversion drum while light is in use.



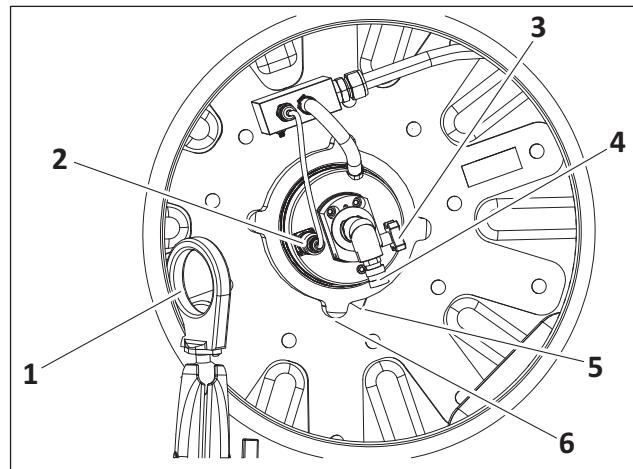
# Blueight LED Curing System Operator's Manual

## Set Up and Configure

### Install Drum

1. Set brake (3).
2. Remove guide ring (1).
3. Rotate drum until triangular notch (5) faces upward.
4. Ensure locating screw is facing up.
5. Slide drum onto hub.

**NOTICE:** Ensure electrical cable is clear of drum and hub.



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6. Place locking nut (6) on hub. Ensure nut is fully seated.
7. Blue air hose from drum to hub connector (4).

**IMPORTANT:** Coupling will click when fully seated.

8. Connect electrical cable to hub connection (2) and secure threaded connection.
9. Release brake.

### Connect Electrical Cables

1. Connect AC power to power converter.

**NOTICE:** Power converter can be powered from either 120V<sub>AC</sub> or 240V<sub>AC</sub> circuits. See "Specifications" on page 59.

2. Connect trolley to control unit. If control unit is mounted on camlock, use 30in (76cm) cable. If control unit is mounted on the trolley, use 15ft (0.38m) cable.
3. Connect power converter to trolley (3).

**IMPORTANT:** Blue cables can be used for both connection types.

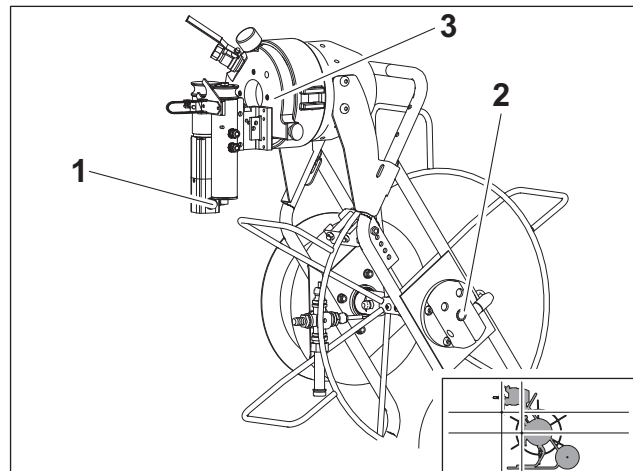
4. Connect propulsion unit to control unit. If control unit is mounted on the trolley (as shown), use 15ft (4.5m) cable. If control unit is mounted on camlock, use 30in (762mm) cable.

**IMPORTANT:** Use adapter cable for proper connection.

### Connect Air Hoses

1. Connect air to trolley (2).
2. Connect light head (1) to camlock (3).
3. Remove light from case.

**NOTICE:** Only touch light with clean gloves. Clean light surface before use.



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### Attach Light Head

**NOTICE:**

- Only touch light with clean gloves.
- Clean light surface before operation.

1. Pass light head through guide ring.
2. Insert into camlock.
3. Tighten sluice fitting into camlock. Ensure there is a tight seal around tubing.

### Check Connections

1. Once all connections are made, control panel will start.
2. Touch panel.
3. All indicators in top left of display will light green.
4. System status box will display "Ready to Cure".

### Connect Liner

1. Deploy liner following instructions in drum manual.

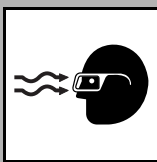
**NOTICE:** Ensure no water can access liner.

**IMPORTANT:** For information on inverting liner, see Installation and Procedures Guide.

2. Connect propulsion unit to side entry valve.
3. Remove air pressure from inversion drum.

**IMPORTANT:** For information, see inversion drum manual.

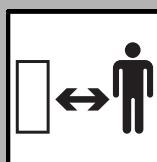
4. Connect air pressure to trolley.
5. Adjust air pressure to 4.5-10psi.

**⚠ WARNING**

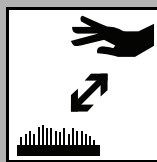
Hazardous optical radiation. Exposure can cause serious injury. Do not look at operating lamp. Wear proper personal protective equipment.

**To help avoid injury:**

- Wear protective goggles rated for high intensity blue light wavelength such as 3M 2846 or equivalent.
- Cover windows on inversion drum while light is in use.

**⚠ WARNING**

Moving parts. Contact can cause serious injury. Stay away.

**⚠ CAUTION**

Hot parts. Contact can cause burns. Do not touch until cool. Wear gloves. 275-355 (2-P), 273-423 (2-P)

1. Set liner size, weight, and length..

**IMPORTANT:** If exact dimension is not available, select the closest larger width.

2. Power light head.
3. System will begin pull.

**IMPORTANT:** Pull may slow in pipe elbows and transitions.

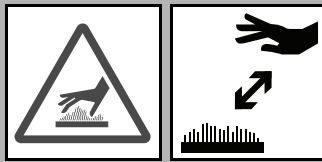
4. Clean light tube as it is reeled in.
5. Monitor gauges and plot..

**NOTICE:** Do not allow system to continue pull past end of liner.

6. When light head nears end of liner, alarm will sound.
7. Monitor light head location. Add distance and restart system or stop pull early as needed.
8. When pull is complete, retract light head fully into camlock fitting.

### Shut Down

1. Ensure pipe is depressurized.
2. Disconnect camlock unit from side entry valve.
3. Store camlock unit in trolley garage.
4. Unscrew light head from sluice fitting.
5. Remove light head from camlock.
6. Inspect light head and clean as needed. See "Clean Light Head" on page 55.



**CAUTION** Hot parts. Contact can cause burns. Do not touch until cool. Wear gloves.

**NOTICE:** Only touch light with clean gloves.

7. Store light head in case.
8. Ensure system is depressurized.
9. Shut down air supply.
10. Disconnect air hoses.
11. Unplug machine.
12. Disconnect blue cables.



# Systems and Equipment

## Chapter Contents

Customizable Cable . . . . . 46

Drums . . . . . 46

Light Sources . . . . . 47

Spacers . . . . . 47

Troubleshoot System . . . . . 47

## Customizable Cable



**⚠ DANGER**

Electrical supply. Shock will cause death or serious injury. Only use in a dry and protected environment with a properly grounded power source.

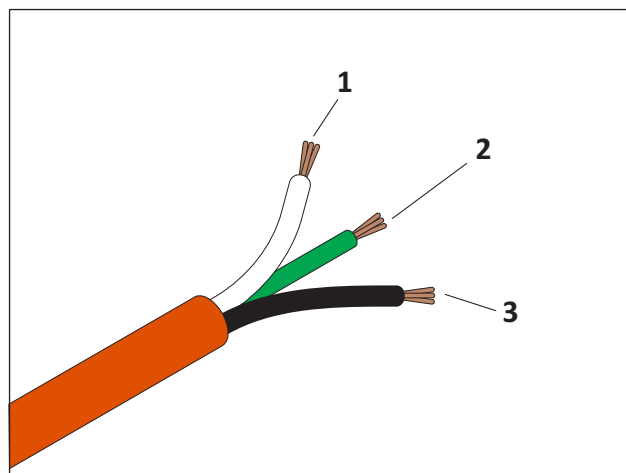
**To help avoid injury:**

- Installation of connector must meet all national and local codes.
- Ensure only qualified personnel install plug.
- Ensure power supply is rated to listed current for a given supply voltage.
- Only operate on a supply with appropriately sized fuse or circuit breaker.
- Disconnect supply cord before installing connector.
- Always connect green or green/yellow conductor to supply grounding terminal first and never to a line terminal.
- Securely connect all wires and terminals.

Customizable cable can be connected to a variety of connectors depending on your power supply. System automatically adjusts to input voltages between 115V and 277V.

Voltage 50/60Hz Single Phase	Input Current at Rated Output
120V	14A
230V	7A
277V	6A

1. Connect green wire (2) to connector grounding terminal.
2. Connect white wire (1) to connector neutral terminal.
3. Connect black wire (3) to connector line/supply terminal.
4. Attach connector strain relief to outer jacket of supply cable.



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## Drums

Several drum sizes are available. Contact your HammerHead® dealer for more information.

## Light Sources

Three light source styles are available. Contact your HammerHead® dealer for more information.

Light Head	Liner Size
144	3" (75mm)
336	4-6" (100-150mm)
696	4"-12" (100-300mm)

## Spacers

Spacers for use with the light sources are available in a variety of sizes. Contact your HammerHead dealer for more information.

## Troubleshoot System

When system detects a problem, a message will be displayed. If this happens, stop operation and review chart below.

Item	Description	Notes
Alarm! Pressure too high/low	Check air pressure to propulsion unit. Verify pressure readings on display and trolley match.	
Alarm! Temperature too high	Ensure air flow is sufficient. Ensure air is chilled and dried.	Light head cannot be operated. System will shut down when temperature limit is exceeded.





# Complete the Job

## Chapter Contents

**Disassemble Machine. . . . . 50**

- Clean Equipment. . . . . 50
- Procedure . . . . . 50
- Secure Components . . . . . 51

**Restore Jobsite . . . . . 51**

## Disassemble Machine

### Clean Equipment

**NOTICE:** Water can damage electronics. When cleaning equipment, do not spray electrical components with water.

Wipe down equipment to remove dirt and debris.

### Procedure

1. Store light head in case and secure inside hose reel.
2. Lock hose reel.
3. Remove guide ring.
4. Rotate drum to upright position. Ensure notch is pointing up.
5. Engage brake by turning drum clockwise.
6. Disconnect air and electrical connections.

**NOTICE:** Ensure air and electrical supply are disconnected at junction box and back of hub before disconnecting drum connections.

**IMPORTANT:**

- Pull sleeve on air fitting to disconnect.
- Rotate blue collar on electrical fitting to disconnect.

7. Remove locking nut from hub.
8. Remove drum from hub.
9. Cover electrical connector.
10. Load components onto transport vehicle. See "Specifications" on page 49 or measure and weigh equipment before lifting.

### Clean Light

1. Remove front cover with included spanner.
2. Remove protective glass.
3. Inspect o-rings on camera and replace as needed.
4. Scrape deposit from edge.
5. Remove protective glass.
6. Clean both sides of glass with isopropyl alcohol and lint free paper.
7. Inspect seals on either side of glass and replace as needed.

8. Clean camera.
9. Clean LEDs with soft brush and isopropyl alcohol.
10. Inspect LEDs for moisture. Dry with compressed air as needed.
11. Reattach protective glass and front cap.

### **NOTICE:**

- Ensure seals are seated properly
- Only reattach glass when all elements are completely dry.

## **Secure Components**

When securing components, use extra caution to prevent any movement during sudden takeoffs and stops. Secure the components in a way that prevents movement. Make sure all accessories and tools are loaded and properly secured.

## **Restore Jobsite**

Fill in installation and service connection pits.



# Service

## Chapter Contents

**Service Precautions . . . . . 54**

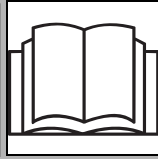
**Recommended Lubricants . . . . . 54**

• Washing Precaution . . . . . 54

**50 Hours. . . . . 56**

**As Needed . . . . . 58**

## Service Precautions



**WARNING** Read operator's manual. Know how to use all controls. Your safety is at stake.

### To help avoid injury:

- Wear personal protective equipment.
- Use only approved service parts.
- Only service with unit unplugged unless otherwise stated.

### NOTICE:

- Use only genuine HammerHead parts and approved lubricants to maintain warranty.
- Use the "Service Record" on page 63 to record all required service to your machine.

Proper lubrication and maintenance protects HammerHead<sup>®</sup> equipment from damage and failure. Service intervals listed are minimum requirements. In extreme conditions, service machine more frequently. Use only recommended lubricants.

## Recommended Lubricants

Item	Description
EPG	Extreme-Pressure Grease

## Washing Precaution

**NOTICE:** Water can damage electronics. When cleaning equipment, do not spray electrical components with water.

## Each Use

Tasks	Notes
Clean light head	
Clean glass	

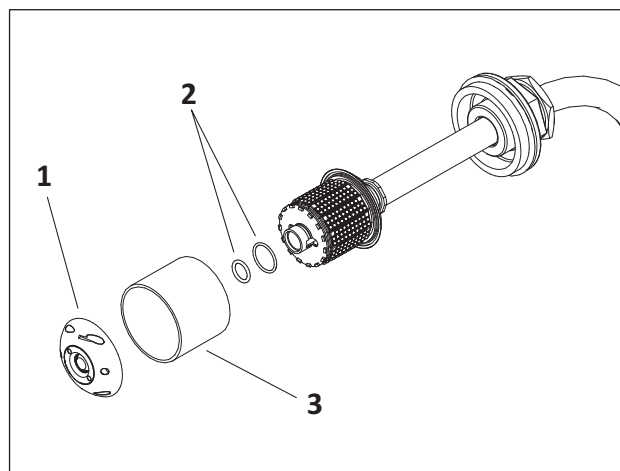
## Clean Light Head

**NOTICE:** Only handle light head with clean gloves.

Clean light source after each use or every 100ft (30m).

### Components

1. Remove front cover (1) with pliers.
2. Inspect seal rings (2) on camera and replace as needed.
3. Scrape any deposit off edge.
4. Remove protective glass (3).
5. Clean glass. See "Glass" on page 55.
6. Inspect the seal ring on hose end and replace as needed.
7. Clean camera.
8. Inspect components for moisture. Dry with compressed air as needed.
9. Reattach protective glass front cover.



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**NOTICE:** Only reattach glass after isopropyl alcohol has dried.

### Glass

**NOTICE:** Only handle glass with clean gloves.

Clean glass after each use or every 100ft (30m).

1. Inspect glass for resin or residue.
2. Coat glass with isopropyl alcohol and wipe with lint free towel.
3. If residue remains, use razor blade to remove.
4. Clean with isopropyl alcohol.
5. Repeat steps 3 and 4 until glass is free of residue.



## ***Bluelight LED Curing System Operator's Manual***

### ***50 Hours***

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6. Use compressed air to remove dust or lint from glass.
7. Install glass. See "Clean Light Head" on page 55.

## **50 Hours**

Tasks	Notes
Inspect and clean drive wheels	

### **Inspect and Clean Drive Wheels**

Inspect and clean drive wheels after first 50 hours and every 150 hours thereafter.

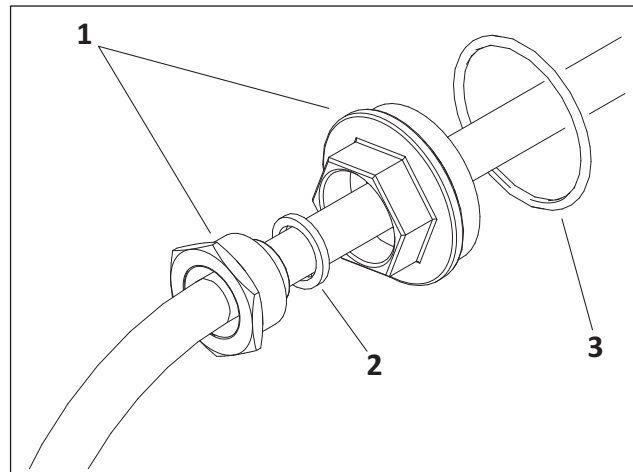
## **4000 Hours**

Tasks	Notes
Replace packing seal	
Replace drive wheels	

### **Replace Packing Seal**

Replace motor rollers every 4000 hours.

1. Unscrew sluice fittings (1).
2. Replace o-ring (3) as needed.
3. Discard old packing seal (2).
4. Cut packing to length as needed and coil in inner diameter of the sluice fitting as shown.
5. Re-connect sluice fitting. Tighten until finger tight.
6. Start machine.
7. If air escapes from fitting, shut down machine and tighten.



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### **Replace Propulsion Wheels**

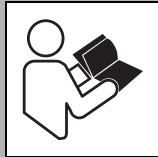
Replace propulsion wheels every 4000 hours.

1. Loosen wing screws.
2. Remove drive wheel.
3. Replace.

## As Needed

Tasks	Notes
Check valves and hoses	
Grease wheels	EPG

### Check Valves and Hoses

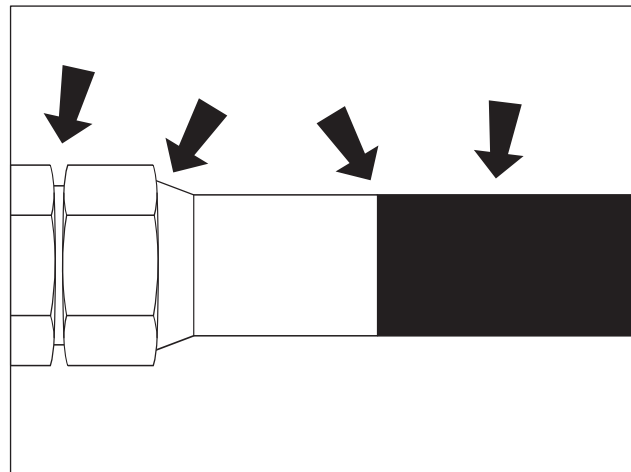


**⚠ WARNING** Pressurized fluid or air could pierce skin and cause severe injury. Refer to operator's manual for proper use. 270-6035

#### To help avoid injury:

- Before using system, check that all connections are tight and all lines and hoses are undamaged.
- Wear protective clothing, including gloves and eye protection.

Check valves and hoses as needed for leaks, loose fittings, unusual noise or vibration. Repair or replace if needed.

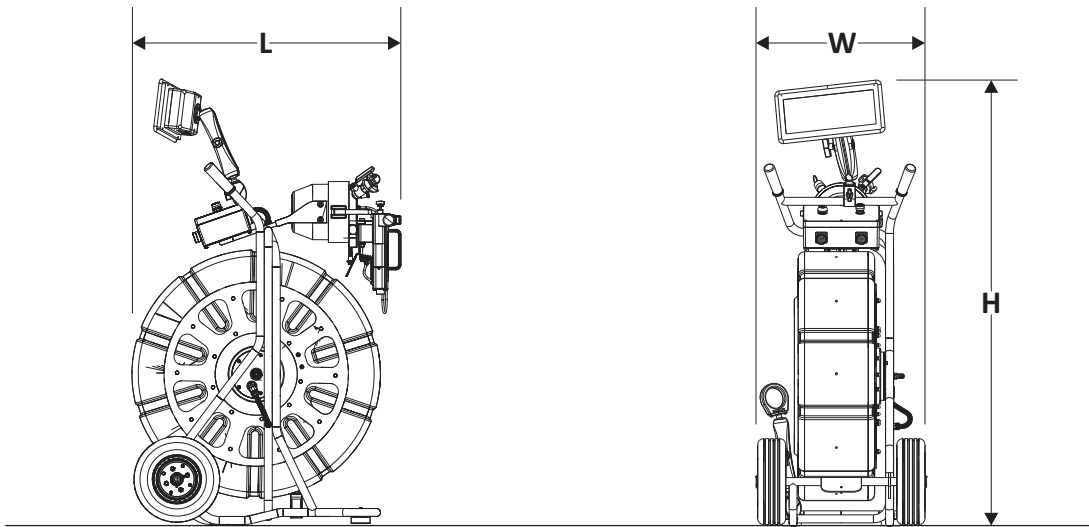


CheckHoses.eps

### Grease Wheels

Grease wheels with EPG at zerks as needed.

Specifications



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Dimensions		U.S.	Metric
L, length		31in	78.7cm
W, width		21in	53.3cm
H, height		43in	110.5cm
Weight		820lb	371.9kg
	Trolley	696lb	315.7kg
	Display	124lb	56.2kg
	Intelligent power converter	56lb	25.4kg

Power	
Cables	
	120V <sub>AC</sub> /60Hz, 14A*
	220V <sub>AC</sub> /50Hz, 7A
	240V <sub>AC</sub> /60Hz, 6A

\*Power is limited to 15A when using the 120V<sub>AC</sub> cable. It may be necessary to reduce applied power further if supply voltage is low.

## ***Bluelight LED Curing System Operator's Manual***

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### **Noise Levels**

This machine can generate sound levels exceeding 80dBA. Always wear appropriate hearing protection when operating machine. Find sound power and pressure information at [www.ditchwitch.com](http://www.ditchwitch.com), or contact HammerHead customer support.

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# **Support**

## **Procedure**

Notify your dealer immediately of any malfunction or failure of HammerHead® equipment.

Always give model, serial number, and approximate date of your equipment purchase. This information should be recorded and placed on file by the owner at the time of purchase.

Return damaged parts to dealer for inspection and warranty consideration if in warranty time frame.

Order genuine HammerHead replacement or repair parts from your authorized HammerHead dealer. Use of another manufacturer's parts may void warranty consideration.

## **Resources**

### **Publications**

Contact your HammerHead dealer for publications and videos covering safety, operation, service, and repair of your equipment.

### **HammerHead Training**

For information about on-site, individualized training, contact your HammerHead dealer.

# Warranty

## Limited Warranty Policy

Earth Tool Company LLC, hereinafter sometimes referred to as ETC warrants each new industrial product of its own manufacture to be free from defects in material and workmanship, under normal use and service for one full year after delivery to the owner or 1000 operating hours, whichever occurs first. During the warranty period, the authorized selling HammerHead® Dealer shall furnish parts without charge for any HammerHead product that fails because of defects in material and workmanship. Warranty is void unless warranty registration card is returned within ten days from the date of purchase. This warranty and any possible liability of Earth Tool Company LLC here under is in lieu of all other warranties, express, implied, or statutory, including, but not limited to any warranties of merchantability or fitness for a particular purpose.

The parties agree that the Buyer's SOLE AND EXCLUSIVE REMEDY against ETC, whether in contract or arising out of warranties, representations, or defects shall be for the replacement or repair of defective parts as provided herein. In no event shall ETC's liability exceed the purchase price of the product. The Buyer agrees that no other remedy (including, but not limited to, incidental or consequential loss) shall be available to him. If, during the warranty period, any product becomes defective by reason of material or workmanship and Buyer immediately notifies ETC of such defect, ETC shall, at its option, supply a replacement part or request the return of the product to its plant in Lake Mills, Wisconsin. No part shall be returned without prior written authorization from ETC, and this warranty does not obligate ETC to bear any transportation charges in connection with the repair or replacement of defective parts. Earth Tool Company LLC will not accept any charges for labor and/or parts incidental to the removal or remounting of parts repaired or replaced under this Warranty.

This Warranty shall not apply to any part or product which shall have been installed or operated in a manner not recommended by ETC nor to any part or product which shall have been neglected, or used in any way which, in ETC's opinion, adversely affects its performance; nor negligence of proper maintenance or other negligence, fire or other accident; nor with respect to wear items; nor if the unit has been repaired or altered outside of an ETC authorized dealership in a manner of which, in the sole judgment of ETC affects its performance, stability or reliability; nor with respect to batteries which are covered under a separate adjustment warranty; nor to any product in which parts not manufactured or approved by ETC have been used, nor to normal maintenance services or replacement of normal service items. Equipment and accessories not of our manufacture are warranted only to the extent of the original Manufacturer's Warranty and subject to their allowance to us, if found defective by them. ETC reserves the right to modify, alter, and improve any product or parts without incurring any obligation to replace any product or parts previously sold with such modified, altered, or improved product or part. No person is authorized to give any other Warranty, or to assume any additional obligation on ETC's behalf unless made in writing, and signed by an officer of ETC.

**EARTH TOOL COMPANY LLC**

**Lake Mills, Wisconsin**

## Service Record

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# Bluelight LED Curing System Operator's Manual

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