



INSTRUCTION MANUAL

Brightline™ Economy Line Projecting Laser

Notice

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Failure to heed the recommendations, warnings, and safety information provided herein may result in property damage, serious injury, or death. Please read this entire document before attempting to operate the product, and store these instructions with the product at all times.

Introduction

Thank you for purchasing the Brightline Economy Alignment Laser from Laserglow. This laser module is designed to provide a bright, highly visible, and precise laser dot for a wide range of industrial applications. The laser is packed inside a protective carrying case which can be used when storing or transporting the laser. This manual contains complete instructions on how to set up and operate your laser, descriptions of all features, and some troubleshooting tips. If after reading this manual you still have questions about the safe and proper operation of your laser, please contact us and we would be happy to assist you.

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SECTION 1 - Safety Information

READ THIS FIRST - STORE THIS WARNING WITH LASER AT ALL TIMES

WARNING:



This is a Class 3R laser device. **The laser radiation emitted from the aperture may be hazardous to the eyes from prolonged exposure.** This hazard is increased if the beam is viewed through magnifying optics such as binoculars, microscopes, telescopes, etc.



Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure



Prolonged direct exposure to the eyes may cause temporary or permanent eye damage. **Do not stare into the beam.**



If prolonged exposure is required for some reason, laser safety goggles may be employed to protect personnel from the laser hazard. Appropriate laser safety goggles may be purchased from Laserglow Technologies.



The use of focusing optics may create a highly-concentrated region of laser energy within the beam, which could be capable of damaging certain materials or harming people. This includes, but is not limited to: camera lenses, magnifying glasses, eyeglasses, telescopes, binoculars, etc. **If using this laser with additional optics, steps must be taken to ensure that the power concentration in the resulting beam does not exceed established safety limits.**



Keep laser devices away from children.



Do not direct the beam at any occupied or moving vehicles. (Aircraft, boats, cars, etc.) Interference with the operation of a vehicle is a criminal offense in most countries.



It is the owner's responsibility to ensure that all operators of this device are familiar with all laws and safety procedures relevant to this device.



By operating this device, you agree that you have read and understood your local regulations relating to the ownership and use of laser devices within this classification.

If you have any more questions or concerns regarding the safe and proper operation of our products please contact us.

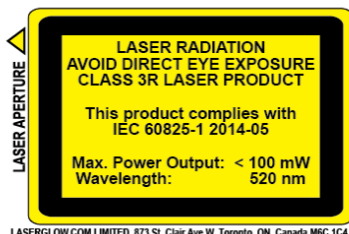
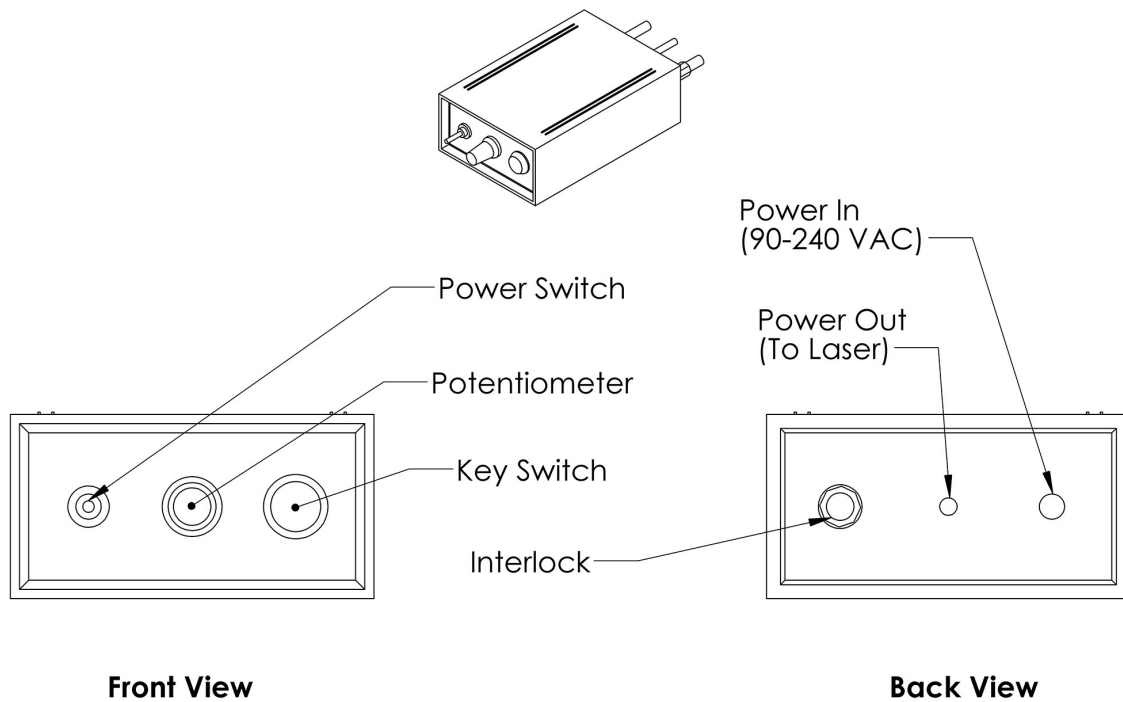
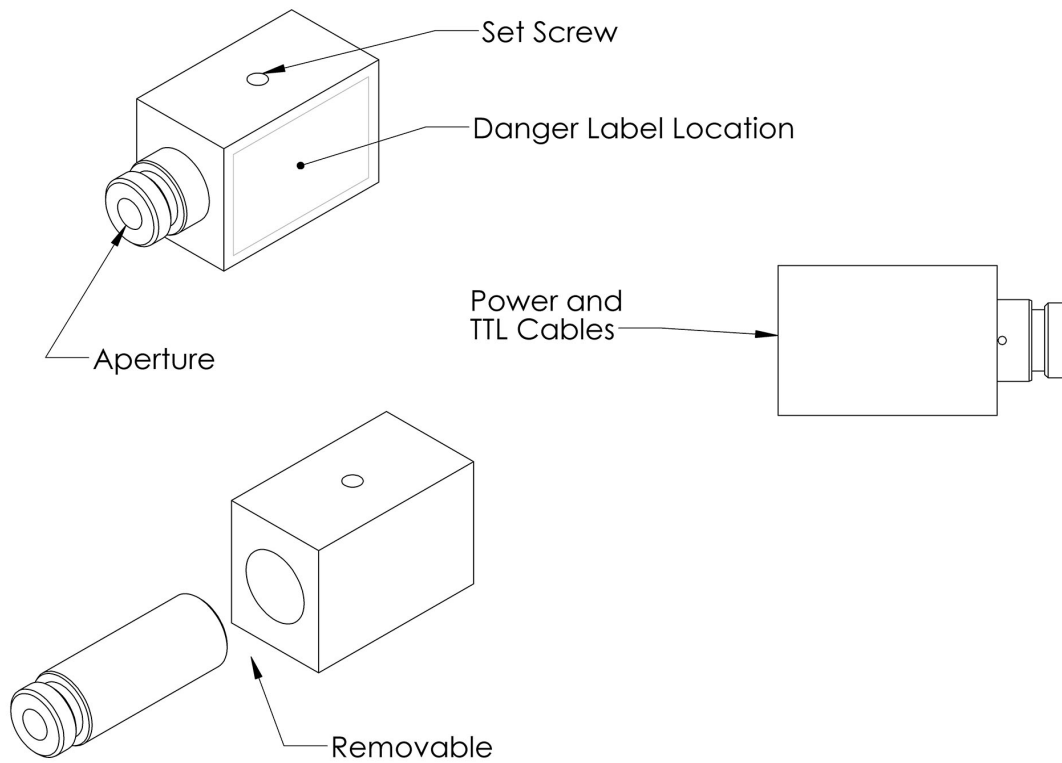


Figure 1 - Danger Label

This danger label is attached to the laser, and must remain on the laser at all times. If the danger label becomes damaged or is removed, contact Laserglow to receive a replacement label at no cost.

SECTION 2 - Product Diagram



SECTION 3 - Unpacking and Inspection

This laser was shipped to you in a foam-lined carrying case to protect it from damage during storage and transit. However, unexpected things can occur during shipping, so it is important to inspect and test your laser as soon as it arrives. Claims for shipping damage must be made within 7 days of receipt. Beyond this time, any damage to the laser will be considered to have occurred while it was in your possession, which may void your warranty.



1. Inspect the shipping carton and carrying case:

Look for obvious signs of damage or exposure to moisture. If either are present, contact Laserglow immediately for instructions on how to proceed. In the unlikely event that the laser is damaged this information may be important for filing a claim with the carrier.



2. Open the case:

Open the case by unsecuring the two latches and lifting the top.



3. Unpack the laser and power supply, if included:

The laser head is a metal cylinder housed in a rectangular mounting block. Gently remove the laser head from the case and inspect it for any physical damage which may have occurred during shipping, then do the same for the power supply, if included. If any physical damage or moisture is present, contact Laserglow immediately to report it.



4. Check the contents of the shipment against the packing list:

Your laser may have included a power supply, mounting bracket, or other accessories. Check the packing list and make sure that all of the listed items are present. If everything is included and there is no evident damage, proceed through this manual for instructions on how to set up and test your laser. If there is any discrepancy please contact Laserglow immediately.

SECTION 4 - Setting Up Your Laser

Do not plug in the laser until instructed to do so. Failure to follow proper set-up procedures may result in exposure to hazardous levels of laser radiation. Permanent eye damage, personal injury, property damage, fire, or even death may result from the misuse of this device. Read through the entire procedure first to ensure that you understand what is required, then come back to this point and perform the steps in order. If at any point you are unclear about how to proceed, contact us and we will gladly assist you.

It is best to test the laser before connecting it to any additional equipment that you may be using. This way, you can check for problems and familiarize yourself with the operation and control of the laser before introducing extra variables.

1. Mount the laser head:

The laser head is passively-cooled, so make sure that the laser is used in a well-ventilated area where the ambient temperature is within the rated operating temperature for this device. (See specification sheet for details.) If you run the laser for a long period of time in a small enclosed space it may overheat.

When first setting up the laser head, ensure that it is pointed at a safe target. While this laser is not hazardous for momentary accidental exposure, it can be a distraction to people operating dangerous equipment. If the laser beam enters a person's eye directly, it may cause momentary flash-blindness which can also pose a safety hazard. The laser should be mounted so as to minimize direct exposure.

There are two mounting screws in the mounting block (M3 x 0.5), which you may use to attach this laser to the Brightline Standard Mounting Bracket. (Part # ABB000XXX) There is also a single 1/4-20 threaded hole located between these screws, which you may use to attach the laser to the Brightline Deluxe Mounting Bracket (Part # ADB000XXX) or any other 1/4-20 threaded attachment, such as a camera tripod or optical post.

2A: If you are powering the laser directly with 5.0 VDC:

The laser will begin to emit as soon as power is delivered. Before applying power, check once more to ensure that the laser is pointed at a safe target. Use only a voltage-regulated 5.0 VDC source, as higher voltages may damage the laser. Connect your power source to the 5.5 mm DC connector on the laser head, with the positive pole on the middle pin.

2B: If you are using the Brightline AC Power Supply:

(Part # ABP00AXXX, ABP00EXXX or ABF05A2XX)

The power supply should not be plugged into any power source at this time. Complete the following steps to ensure that the power supply is in an inactive state before you connect the laser.

1. On the front of the power supply: Ensure that the key is not inserted into the key switch.
2. On the front of the power supply: Ensure that the power switch is set to "OFF" (down).
3. On the front of the power supply: Ensure that the power adjustment knob is turned all the way down. (counterclockwise)
4. On the back of the power supply: Check that the safety interlock is in place. This is a small black plug which resembles a headphone plug.
5. You can now connect the power supply to the 5.5 mm EIAJ-04 connector on the laser head.

2C: If you are using the Standard Brightline AC Power Supply:

(Part # ABF00AXXX or ABF05A3XX)

The power supply should not be plugged into any power source at this time. Complete the following steps to ensure that the power supply is in an inactive state before you connect the laser.

1. On the in-line power switch: Ensure the power switch is set to the off position.

SECTION 5 - Operation

Power Up Sequence

Inform everybody in the area that you are about to activate the laser and that they should take the necessary safety precautions, according to your organization's safety protocols.

If you are providing power from your own 3.0 VDC source:

The laser will begin to emit as soon as you provide power.

If you are using the Adjustable Brightline AC Power Source:

1. Insert the power cable of the power supply into a grounded 85-264 VAC outlet.
2. On the front of the power supply: Insert the key into the key switch and rotate it 90 degrees clockwise. Do not force the key beyond this point or you may damage the switch.
3. On the front of the power supply: Turn the power switch to the "ON" position. (up)
4. Slowly turn the power adjustment knob clockwise until the red light on the power supply is illuminated and the laser output is visible.
5. If you need to align the laser to the rest of your apparatus, you should do this with the power knob at the lowest possible setting. After the laser has been aligned you can turn it up to the desired power level.

If you are using the Standard Brightline AC Power Source:

1. Insert the power supply into a grounded 85-264 VAC outlet.
2. On the power supply in-line switch: Turn the power switch to the "ON" position.

Power Down Sequence

If you are powering the laser directly with 3.0 VDC:

Turn off the power source. The laser will stop emitting immediately.

If you are using the Brightline AC Power Supply:

1. On the front of the power supply: Flip the power switch to the "OFF" position. (down)
2. On the front of the power supply: Rotate the key 90 degrees counterclockwise and remove it from the key switch.
3. It is recommended that you unplug the laser from the electrical outlet when not in use, to eliminate the possibility of accidental activation by an untrained user or damage to the power supply from an electrical surge.

Modulation and Controls

Changing the Line/Cross Orientation

Not applicable to "Dot-Generating" lasers.

To change the orientation of the line, cross, or other pattern which is projected by your laser:

1. Using the included hex key, loosen the set screw located on the top of the mounting block which holds the cylindrical laser module. (This set screw is located opposite the mounting screws.)

2. In some cases the danger label may cover this screw. If this is the case, carefully peel back the label to locate the screw, and make sure that you replace the label when you are done. If you require a replacement danger label, contact Laserglow to receive one at no cost.
3. Once the set screw is loosened you can rotate the cylindrical laser module inside the mounting block until the projected image is oriented according to your requirements.
4. Tighten the set screw until it is snug. Be careful not to over-tighten, as this can damage the screw or the laser housing.

Adjusting the Focus

This laser features adjustable focus, so you can set the size or sharpness of the projected image at a given distance. In order to get the best image quality, you should adjust the laser so it is focused at the working distance. If you are aligning objects at various distances, you should set the focal distance at the furthest working distance. This will ensure the smallest possible beam size over the entire range. The focal distance is adjusted by turning the knurled ring just behind the laser aperture.

To lock/unlock the focus adjustment ring:

1. Loosen the focus lock set screw, located on the aperture cap, just in front of the focus adjustment ring. (A small hex key has been included for this purpose.) To avoid losing this screw, you should not remove it completely. Just loosen it to the point that the aperturecap will rotate.
2. CAUTION: Do not remove the aperture cap, especially while the laser is powered up. Doing so may expose you to hazardous levels of laser radiation.
3. Once this screw is loose, the entire aperture cap should thread in and out.
4. To unlock the focus adjustment ring: Thread the aperture cap away from the focus adjustment ring until the ring will rotate freely. Do not loosen the aperture cap more than necessary.
5. To lock the focus adjustment ring: Thread the aperture cap towards the focus adjustment ring until it is snug and the adjustment ring will not rotate freely.
6. To avoid altering the focus while you do this, it is helpful to hold the focus adjustment ring in place with one hand while you tighten the aperture cap against it, using the other hand.
7. When you have adjusted the focus of the laser to the desired distance, lock the ring and re-tighten the focus lock set screw.

Using Electronic Modulation

On the back of the laser head is a 5.5 mm EIAJ-04 connector which will accept an electronic modulation signal. (This is the same connector type as the power input, but it is labelled "TTL Modulation Input".) The modulation input will allow you to pulse the laser at a specified frequency, or turn it on and off remotely. The modulation input signal is created using a function generator, PLC, or similar equipment. (These are sold separately. Contact us for more information about compatible function generators.) The behavior of the modulation circuit is explained below:

This laser features TTL+ modulation

- This modulation mode allows you to turn the laser on and off, but does not allow you to dynamically control the output power.
- This laser will accept a 0-5 VDC signal via the modulation input wires.
- The laser will be off when the signal is below 1.0 V and will turn on above this voltage.
- The actual trigger voltage varies slightly, so for the best results we recommend using a 0-5 V square wave input.
- The maximum frequency at which the laser will cycle is 200 Hz.
- The duty cycle of the input signal can be anywhere between 0-100%.
- If the duty cycle is very low, the laser may not have time to fully power up before the end of the pulse, and the observed output power may be lower than expected. Please reference the rise time for this laser in the specification sheet.
- If the duty cycle is very high, the laser may not have time to fully discharge before the next cycle begins. This will result in output that does not completely extinguish between cycles. Please reference the fall time for this laser in the specification sheet.
- If there is nothing connected to the modulation input the laser will run continuously.

Adjusting Brightness using Attenuator:

(Part # ABLATTXXX - Red colored and mounted to the laser aperture)

Attached to the front of your laser is a special attenuator that allows you to adjust the brightness of the laser. The attenuator consists of two parts: An inner ring, which is attached to the laser aperture, and an outer ring which is attached to the inner ring. To adjust the brightness, loosen the set screw holding out outer ring to the inner ring, and rotate the outer ring. The ring will only need to move a quarter turn to change the brightness from zero to full. Once you have achieved the desired brightness level, gently tighten the set screw again to lock the outer ring in position

SECTION 6 - Troubleshooting

Problem	Possible Cause	Solution
Red "power" light on power supply does not turn on.	Power supply is not receiving electricity	Check the electrical source to ensure that it is turned on.
	Power switch is not turned on.	If you have the power supply oriented so that the power switch is on the left and the key switch is on the right, flipping the power switch UP will turn it ON and DOWN will turn it OFF.
	Power adjustment knob is turned down.	If you have the power supply oriented so that the power switch is on the left and the key switch is on the right, flipping the power switch UP will turn it ON and DOWN will turn it OFF.
Red "power" indicator light on power supply turns on, but laser does not emit.	Key switch is not turned on	Check the electrical source to ensure that it is turned on.
	Safety interlock is not connected	If you have the power supply oriented so that the power switch is on the left and the key switch is on the right, flipping the power switch UP will turn it ON and DOWN will turn it OFF.
	Laser is outside of the operating temperature range	If you have the power supply oriented so that the power switch is on the left and the key switch is on the right, flipping the power switch UP will turn it ON and DOWN will turn it OFF.
	Modulation signal is instructing the laser to remain off	If you are using the modulation input, verify that the input polarity is correct and that the laser is receiving a 5 VDC signal when you want it to be active. To verify whether the modulation input is causing the problem, disconnect the modulation input to verify that the laser operates continuously when not modulated. For complete instructions on using the modulation circuit please see the "Modulation and Controls" section of this manual.
Laser output power is unstable or appears to flicker.	Laser temperature is outside of the specified operating temperature range.	Ensure that the ambient temperature is within the laser's specified operating temperature range. (See specification sheet.)
Laser beam profile is irregular or not as specified.	Laser is operating in a different transverse mode than specified.	Some lasers will output in a different transverse mode when operated at temperatures outside of the operating temperature range. Ensure that the ambient temperature is within the specified range.
	Laser is not focused correctly	Follow the focus adjustment procedure listed in the "Modulation and Controls" section of this manual.
	Output lens is dirty.	Follow the lens cleaning procedure in the "Maintenance" section of this manual.

SECTION 7 - Maintenance

Laserglow's Brightline lasers are solid-state laser devices which require very little maintenance. Depending on the cleanliness of your environment, maintenance may be required with some regularity, or never at all. Inspect the laser regularly to ensure there is no buildup of debris or dust on the output lens. If you notice any buildup or experience performance issues (laser becomes unfocused, brightness appears to fluctuate, etc.) then maintenance may be required.

Cleaning the Output Lens

Depending on the operating environment, it is possible that some dust may accumulate on the output lens of the laser. This will result in a laser beam which is poorly focused or which has a "speckled" appearance. Cleaning the lens does involve some risk, since a scratch in the lens would necessitate a repair. For this reason, it is best if you attempt the most gentle cleaning techniques first, progressing to the more invasive techniques only if the problem is not resolved. At each step, make note of the pattern of speckles and the overall appearance of the laser beam. If this pattern changes after cleaning it means that you are having an effect and should continue with the current technique rather than advancing to the next one. Note that cleaning the lens in any other way will void your warranty and may irreparably damage the laser lens.



NEVER USE tissue paper, paper towel, facial tissues, etc. The wood fibers in these products can damage the coatings on the lens.



NEVER USE cleaning solutions other than those explicitly mentioned here. The lens coatings are delicate and can be damaged by common cleaning products.



NEVER touch the lens or other optics with your fingers as oil from your skin can contaminate and damage the coatings.

Failure to follow these warnings can result in damage to your laser which will not be covered by warranty



1. Compressed air: You can use a can of clean compressed air to try to blow the dust off of the lens without making physical contact with the lens itself. These are commonly used to clean computer keyboards and can be purchased at any office supply store. They usually have a long tube or nozzle attached to them. Carefully insert this tube a few mm into the aperture of the laser to blow air over the lens. Be careful not to touch the lens with this tube. Hold the can upright or it may produce some liquid which can leave deposits on the lens



2. Microfiber cloth: If there are deposits on the lens that cannot be removed with compressed air, you can try using a microfiber lens cloth to gently wipe the output lens. Ensure that the microfiber cloth is clean before you use it, since any oil, dirt, or grit may damage the lens. Since the lens is slightly recessed in the housing, you may need to twist the microfiber cloth into a small "finger" in order to get it deep enough into the aperture to make contact.


If you still cannot reach the lens with the cloth, you may need to remove the aperture cap from the front of the laser: **DISCONNECT THE POWER BEFORE PROCEEDING.** Remove the three set screws from the aperture cap and thread the cap all the way off. The output lens should now be exposed, and you can attempt to clean it using the microfiber cloth



3. Microfiber cloth and lens cleaning solution: If a cleaning solution is required use **ONLY** a specifically-designed lens cleaning solution. (Available from camera stores or optics companies.) Use a very small amount, and wipe the lens only with a microfiber lens cloth. Do not use any other type of cleaning solution or you may permanently damage the lens.

SECTION 8 - Accessories and Options

The most popular accessories for this model are shown below. For additional details regarding these or other accessories please see our website or contact us directly.

Part No.	Description	Inclusion
 ADB002XXX	ADB-deluxe Brightline Deluxe Mounting Bracket V2. Full Details: www.laserglow.com/ADB	Included with Laser
 ABF00AXXX	ABF-N.American Brightline 3V Standard Power Supply (80-260 VAC, N. American plug) Full Details: www.laserglow.com/ADB	Included with Laser

SECTION 9 - Warranty Information

LIMITED PRODUCT WARRANTY:

Laserglow Technologies ("Laserglow") warrants that this product is guaranteed to operate within the stated specifications, free from defects in materials and workmanship, for a period of six (6) months from the date of delivery.

BEFORE RETURNING ANY ITEM FOR SERVICE, PLEASE CONTACT LASERGLOW TO RECEIVE A RETURN AUTHORIZATION (RA) NUMBER. ITEMS RETURNED WITHOUT AN RA NUMBER MAY INCUR DELAYS OR ADDITIONAL FEES.

LASERGLOW'S PLEDGE TO CORRECT PROBLEMS UNDER WARRANTY:

At its option, Laserglow will either repair or replace the in-warranty defective unit without charging the customer for costs of repair or replacement. When parts or products are replaced under warranty the replaced items will automatically become property of Laserglow. Once an item has been repaired or replaced under warranty, the repaired or replacement item assumes the remaining period of warranty based on the original date of delivery, plus the period of time during which the laser was out of the customer's possession. Within North America only, and within the first 30 days of the warranty period, Laserglow will cover the cost of shipping the defective item back to Laserglow and the cost of shipping the repaired/replacement item to the customer. After 30 days, or for overseas shipments, the customer will cover the cost of shipping the defective item back to Laserglow and Laserglow will cover the cost of shipping the repaired/replacement item to the customer. Where Laserglow covers the cost of shipping, the carrier and method of shipping will be at Laserglow's discretion. Items returned to Laserglow as warranty issues, which upon inspection are deemed not to have any defect, will incur a diagnosis service charge of \$119.

NOT COVERED UNDER THIS WARRANTY:

This warranty will become void if any of the following conditions are met:

- The product has been modified or tampered with in any way.
- The product has been dropped or subjected to shock in excess of 100 G.
- The product has been exposed to water, any liquid, or condensing atmospheric humidity.
- The unit was powered from a source other than those which are specified in the instruction manual.
- The unit was operated in an area with ambient temperature outside of the operating temperature range, as stated in the product specifications and instruction manual.
- The serial number or other identifying marks are removed.
- Ownership of the product has changed. (This warranty is not transferable.)
- The warranty period has expired.

NEITHER THIS WARRANTY NOR ANY OTHER WARRANTY OR GUARANTY, EXPRESSED OR IMPLIED STATUTORY OR OTHERWISE, INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL EXTEND BEYOND THE WARRANTY PERIOD. NO RESPONSIBILITY IS ASSUMED FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING, WITHOUT LIMITATION, DAMAGES RESULTING FROM PRODUCT MALFUNCTION, INACCURACY, OR MATHEMATICAL INACCURACY OF THE PRODUCT SPECIFICATIONS. NOTHING IN THIS WARRANTY AFFECTS YOUR STATUTORY RIGHTS.

OTHER BENEFITS (NON-WARRANTY) THAT ARE ACCORDED TO YOU BY LASERGLOW:

10% Replacement/Upgrade Credit: At any time, for the lifetime of the product, you may return the product to us in any condition, functional or not, for a trade-in credit equal to 10% of the original purchase price or 10% of the current retail price, whichever is less. The new product which you select must be of equal or greater value than the trade-in product, based on the value used to calculate the 10% credit amount.

Out-of-Warranty Repairs: The cost of any out-of-warranty repair will be \$80/hr for labor, plus materials.

Rebuild/Complete Product Refurbishment: The cost of a complete rebuild or refurbishment of an out-of-warranty product will be no



www.laserglow.com

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E&OE: Data included in this sheet may be subject to change without notice.
Please confirm critical specifications with our staff prior to ordering.