

WORKSTATION

BW SERIES,

LASER BENCH TOP

OPERATION MANUAL



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Revision Record

Revision	EO	Date	Basis of Revision
A	None	8/98	Production Release
B	18236	4/00	Addition of Model LW150A
C	Unknown	--	----
D	18525	5/03	Change Safety labels.
E	40470	5/10	Update Manual.
F	41612	10/10	Update Safety Interlock Switches.
G	42863	11/13	Update to Miyachi America name and logo.
H	43482	12/14	Updated to Amada Miyachi America name and logo.
J	43878	8/15	Updated to Amada Miyachi America format.

CONTACT US

Thank you for purchasing a Miyachi Unitek Laser Workstation Enclosure. Upon receipt of the laser, please inspect it thoroughly for shipping damage *before* you install it. If there is any damage, contact the shipping company immediately to file a claim, and notify us at:

Amada Miyachi America
1820 South Myrtle Ave.
Monrovia, California 91017-7135
Phone: (626) 303-5676
FAX: (626) 358-8048
E-mail: info@amadamiyachi.com

The contents of this manual are subject to change without notice. If you have any questions, or find any errors or omissions in this manual, please contact us.

Amada Miyachi America is not responsible for any losses due to improper use of this product.

CDRH COMPLIANCE STATEMENT

The heavy-duty steel enclosures meet CDRH Class 1 safety standards.

Reference CDRH Accession number is available upon request.

LIMITED WARRANTY

1. (a) Subject to the exceptions and upon the conditions set forth herein, Seller warrants to Buyer that for a period of one (1) year from the date of shipment ("**Warranty Period**"), that such Goods will be free from material defects in material and workmanship.

(b) Notwithstanding the foregoing and anything herein to the contrary, the warranty set forth in this Section 1 shall be superseded and replaced in its entirety with the warranty set forth on **Exhibit A** hereto if the Goods being purchased are specialty products, which include, without limitation, laser products, fiber markers, custom systems, workstations, Seller-installed products, non-catalogue products and other custom-made items (each a "**Specialty Products.**")

(c) EXCEPT FOR THE WARRANTY SET FORTH IN SECTION 1(A), SELLER MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE GOODS (INCLUDING ANY SOFTWARE) OR SERVICES, INCLUDING ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.

(d) Products manufactured by a third party and third party software ("**Third Party Product**") may constitute, contain, be contained in, incorporated into, attached to or packaged together with, the Goods. Third Party Products are not covered by the warranty in Section 1(a). For the avoidance of doubt, **SELLER MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO ANY THIRD PARTY PRODUCT, INCLUDING ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Notwithstanding the foregoing, in the event of the failure of any Third Party Product, Seller will assist (within reason) Buyer (at Buyer's sole expense) in obtaining, from the respective third party, any (if any) adjustment that is available under such third party's warranty.

(e) Seller shall not be liable for a breach of the warranty set forth in Section 1(a) unless: (i) Buyer gives written notice of the defect, reasonably described, to Seller within five (5) days of the time when Buyer discovers or ought to have discovered the defect and such notice is received by Seller during the Warranty Period; (ii) Seller is given a reasonable opportunity after receiving the notice to examine such Goods; (iii) Buyer (if requested to do so by Seller) returns such Goods (prepaid and insured to Seller at 1820 South Myrtle Avenue, Monrovia, CA 91016 or to such other location as designated in writing by Seller) to Seller pursuant to Seller's RMA procedures and Buyer obtains a RMA number from Seller prior to returning such Goods for the examination to take place; and (iii) Seller reasonably verifies Buyer's claim that the Goods are defective and that the defect developed under normal and proper use.

(f) Seller shall not be liable for a breach of the warranty set forth in Section 1(a) if: (i) Buyer makes any further use of such Goods after giving such notice; (ii) the defect arises because Buyer failed to follow Seller's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods; (iii) Buyer alters or repairs such Goods without the prior written consent of Seller; or (iv) repairs or modifications are made by persons other than Seller's own service personnel, or an authorized representative's personnel, unless such repairs are made with the written consent of Seller in accordance with procedures outlined by Seller.

(g) All expendables such as electrodes are warranted only for defect in material and workmanship which are apparent upon receipt by Buyer. The foregoing warranty is negated after the initial use.

(h) Subject to Section 1(e) and Section 1(f) above, with respect to any such Goods during the Warranty Period, Seller shall, in its sole discretion, either: (i) repair or replace such Goods (or the defective part) or (ii) credit or refund the price of such Goods at the pro rata contract rate, provided that, if Seller so requests, Buyer shall, at Buyer's expense, return such Goods to Seller.

(i) THE REMEDIES SET FORTH IN SECTION 1(H) SHALL BE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN SECTION 1(A). Representations and warranties made by any person, including representatives of Seller, which are inconsistent or in conflict with the terms of this warranty, as set forth above, shall not be binding upon Seller.

Exhibit A
Warranty for “Specialty Products”

Limited Warranty

EXCEPT FOR THE WARRANTY SET FORTH BELOW IN THIS EXHIBIT A, SELLER MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE GOODS (INCLUDING ANY SOFTWARE) OR SERVICES, INCLUDING ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.

Warranty Period: The Warranty Period for Specialty Products is for one (1) year, and the Warranty Period for laser welders and laser markers is two (2) years (unlimited hours), and the Warranty Period for the laser pump diodes or modules is two (2) years or 10,000 clock hours, whichever occurs first (as applicable, the “**Warranty Period**”). The Warranty Period begins as follows: (i) on orders for Goods purchased directly by Buyer, upon installation at Buyer’s site or thirty (30) days after the date of shipment, whichever occurs first; or (ii) on equipment purchased by a Buyer that is an OEM or systems integrators, upon installation at the end user’s site or six (6) months after the date of shipment, whichever occurs first.

Acceptance Tests: Acceptance Tests (when required) shall be conducted at Amada Miyachi America, Inc., Monrovia, CA, USA (the “**Testing Site**”) unless otherwise mutually agreed in writing prior to issuance or acceptance of the Acknowledgement. Acceptance Tests shall consist of a final visual inspection and a functional test of all laser, workstation, enclosure, motion and accessory hardware. Acceptance Tests shall include electrical, mechanical, optical, beam delivery, and software items deliverable under the terms of the Acknowledgement. Terms and conditions for Additional Acceptance Tests either at Seller’s or Buyer’s facility shall be mutually agreed in writing prior to issuance or acceptance of the Acknowledgement.

Performance Warranty: The system is warranted to pass the identical performance criteria at Buyer’s site as demonstrated during final Acceptance Testing at the Testing Site during the Warranty Period, as provided in the Acknowledgement. Seller explicitly disclaims any responsibility for the process results of the laser processing (welding, marking, drilling, cutting, etc.) operations.

Exclusions: Seller makes no warranty, express or implied, with respect to the design or operation of any system in which any Seller’s product sold hereunder is a component.

Limitations: The limited warranty set forth on this Exhibit A does not cover loss, damage, or defects resulting from transportation to Buyer’s facility, improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the equipment, or improper site preparation and maintenance. This warranty also does not cover damage from misuse, accident, fire or other casualties of failures caused by modifications to any part of the equipment or unauthorized entry to those portions of the laser which are stated. Furthermore, Seller shall not be liable for a breach of the warranty set forth in this Exhibit A if: (i) Buyer makes any further use of such Goods after giving such notice; (ii) the defect arises because Buyer failed to follow Seller’s oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods; (iii) Buyer alters or repairs such Goods without the prior written consent of Seller; or (iv) repairs or modifications are made by persons other than Seller’s own service personnel, or an authorized representative’s personnel, unless such repairs are made with the written consent of Seller in accordance with procedures outlined by Seller.

Seller further warrants that all Services performed by Seller's employees will be performed in a good and workmanlike manner. Seller's sole liability under the foregoing warranty is limited to the obligation to re-perform, at Seller's cost, any such Services not so performed, within a reasonable amount of time following receipt of written notice from Buyer of such breach, provided that Buyer must inform Seller of any such breach within ten (10) days of the date of performance of such Services.

Seller shall not be liable for a breach of the warranty set forth in this Exhibit A unless: (i) Buyer gives written notice of the defect or non-compliance covered by the warranty, reasonably described, to Seller within five (5) days of the time when Buyer discovers or ought to have discovered the defect or non-compliance and such notice is received by Seller during the Warranty Period; (ii) Seller is given a reasonable opportunity after receiving the notice to examine such Goods and (a) Buyer returns such Goods to Seller's place of business at Buyer's cost (prepaid and insured); or (b) in the case of custom systems, Seller dispatches a field service provider to Buyer's location at Buyer's expense, for the examination to take place there; and (iii) Seller reasonably verifies Buyer's claim that the Goods are defective or non-compliant and the defect or non-compliance developed under normal and proper use.

All consumable, optical fibers, and expendables such as electrodes are warranted only for defect in material and workmanship which are apparent upon receipt by Buyer. The foregoing warranty is negated after the initial use.

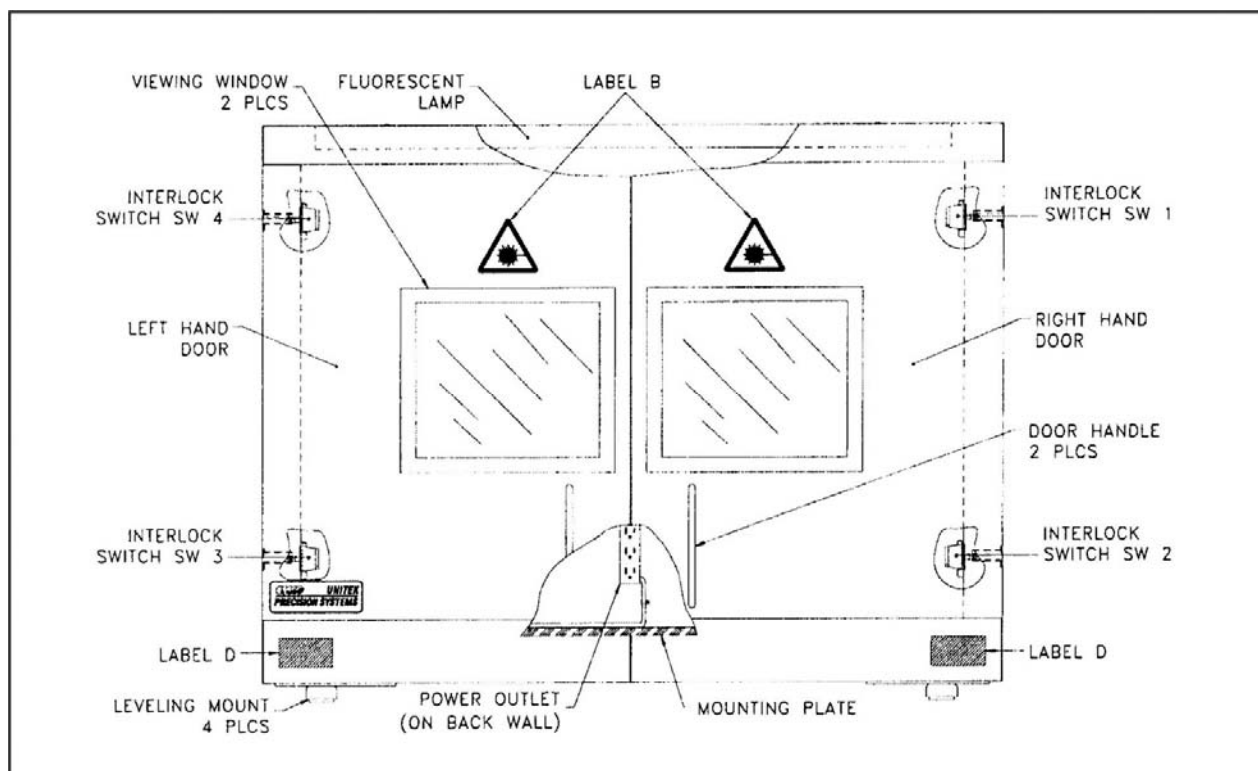
No warranty made hereunder shall extend to any product whose serial number is altered, defaced, or removed.

Remedies: With respect to any such Goods during the Warranty Period, Seller shall, in its sole discretion, either: repair such Goods (or the defective part). **THE REMEDIES SET FORTH IN THE FOREGOING SENTENCE SHALL BE BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN THIS EXHIBIT A.** Representations and warranties made by any person, including representatives of Seller, which are inconsistent or in conflict with the terms of this warranty, as set forth above, shall not be binding upon Seller.

Products manufactured by a third party and third party software ("**Third Party Product**") may constitute, contain, be contained in, incorporated into, attached to or packaged together with, the Goods. Third Party Products are not covered by the warranty in this Exhibit A. For the avoidance of doubt, **SELLER MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO ANY THIRD PARTY PRODUCT, INCLUDING ANY (a) WARRANTY OF MERCHANTABILITY; (b) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; (c) WARRANTY OF TITLE; OR (d) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.** Notwithstanding the foregoing, in the event of the failure of any Third Party Product, Seller will assist (within reason) Buyer (at Buyer's sole expense) in obtaining, from the respective third party, any (if any) adjustment that is available under such third party's warranty.

SECTION I. MAJOR COMPONENTS

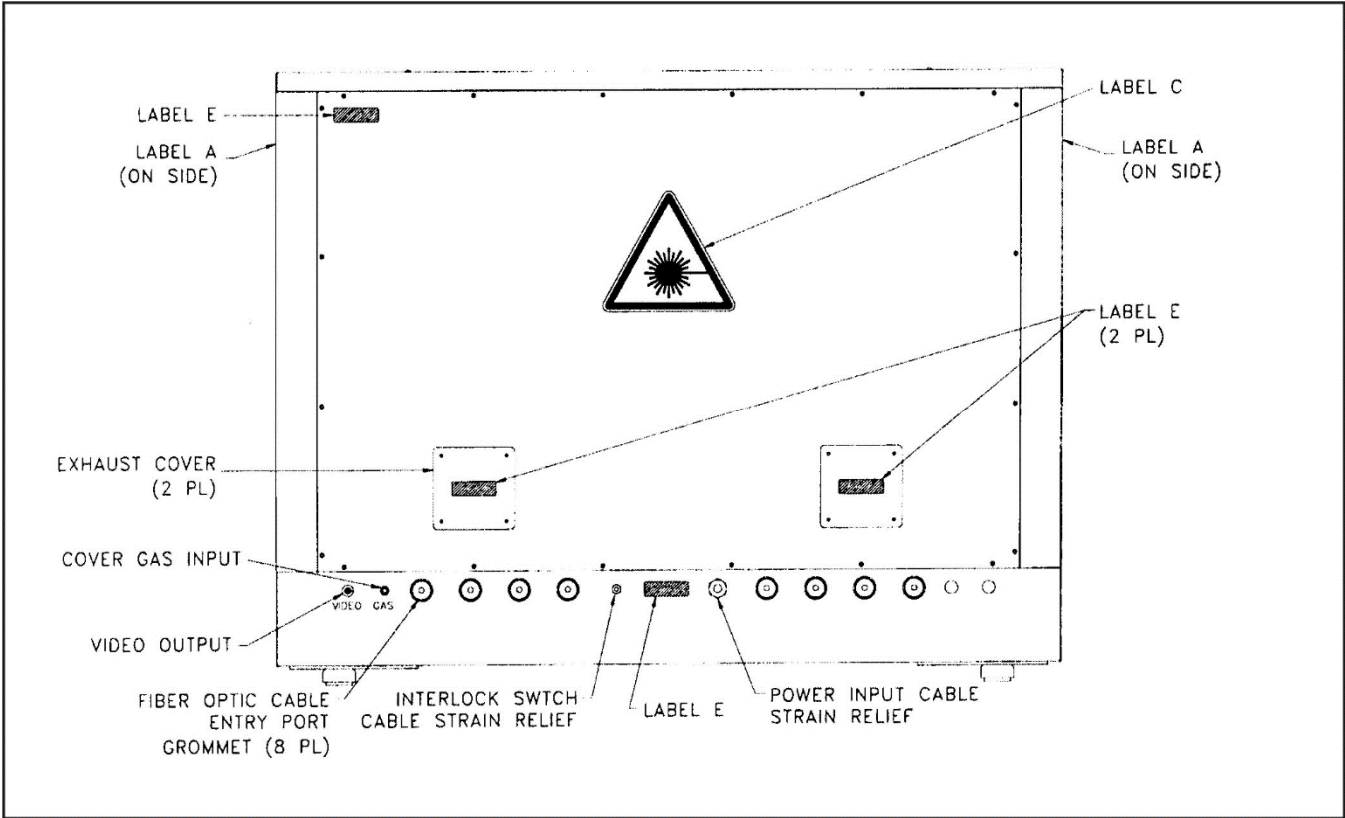
Front Panel Components



Viewing Windows	<p>Glass through which you may safely view the welding operation while the laser beam is turned on.</p> <p>WARNING: The glass is specialty treated (see <i>Specifications</i>). Do not replace the glass with glass having a different optical density specification.</p>
Fluorescent Lamp	Fluorescent lamp provides illumination of work area.
Door Handles	Handles for opening the sliding doors.
Interlock Switches	<p>The four interlock switches are wired in series. Operation of any one of the switches will open the interlock and turn off the laser.</p> <p>WARNING: Do not override these switches. Exposure to laser beam radiation can cause severe injury.</p>
Sliding Doors	Provide access to the interior of the enclosure. When either one is open, and the safety interlock system is connected to the laser, you can not operate the laser.
Mounting Plate	The mounting plate is set in the floor pan of the enclosure (see <i>Specifications</i>). The array of mounting holes allows you to mount your fixtures and instrumentation on a highly stable surface.
Power Outlet	Six power receptacles for providing 120 VAC power to appliances and instrumentation in the enclosure.
Leveling Mount	Shock absorbing mounts with leveling adjustments

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Rear Panel Components



Exhaust Covers	Remove the two covers to ports for exhausting gases from the enclosure interior.
Fiber Optic Cable Entry Port Grommet	These ports provide entry for up to eight fiber optic cables. WARNING: Once a grommet has had a hole punched through it for a fiber optic cable, if that cable is later removed, you could be exposed to dangerous laser radiation escaping through that hole. <i>Replace the grommet with a new grommet</i>
Interlock Switch Cable Strain Relief	Entry port for the interlock switch cable. Refer to the schematic in Figure 3. Wire the four interlock switches in series with the cable provided. Route, dress and secure the cable with the cable clamps provided.
Power Input Cable Strain Relief	Exit port for the power bar cable
Cover Gas Input	This port used for cover gas required applications. Use ¼" OD tube.
Video Output	Dual BNC connector used for connecting CCTV focus heads to external cross-hair generators.

Laser Safety Labels

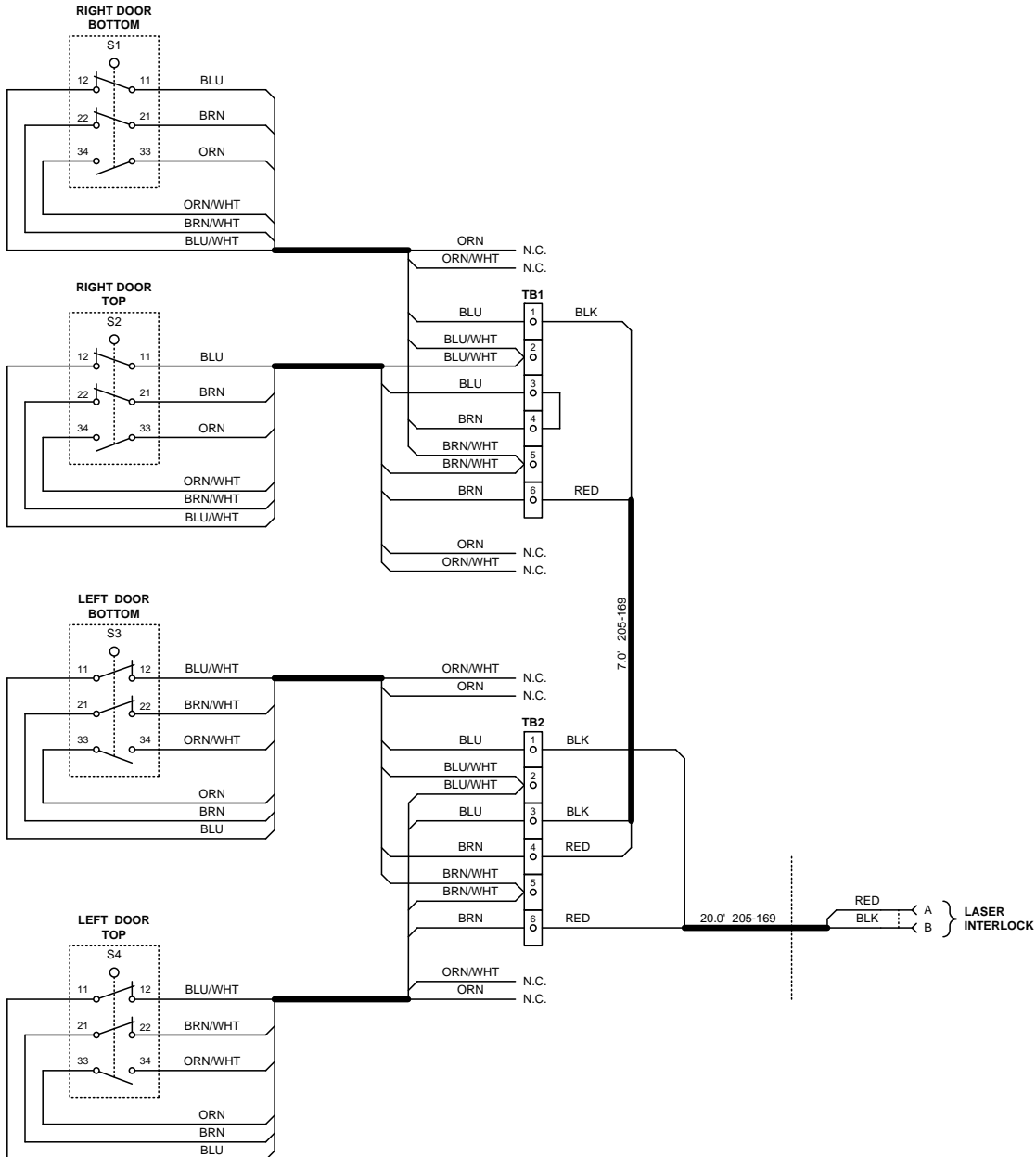
The following laser safety labels are mounted on the workstation. See the **Front Panel Components** and **Rear Panel Components** illustrations for label locations.

A, B, C	<div></div> <p>NOTE: label A is the smallest, label C is the largest.</p>
D	<div><div>DANGER VISIBLE AND/OR INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.</div></div>
E	<div><div>DANGER VISIBLE AND/OR INVISIBLE LASER RADIATION WHEN OPEN. AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION.</div></div>

SECTION II. USER MAINTENANCE

WARNINGS

- Some laser beams are invisible. You will be unable to determine laser light leakage with the human eye. If you think you have leakage, place a bright light bulb in the workstation and check for leaks. If you have a light leak, do **not** use the workstation until it is repaired.
- Due to safety issues, you should consult with Amada Miyachi America (address telephone and E-mail address on front cover) prior to making any repairs on your workstation. If necessary, we will have you return the unit to us, or send one of our technicians to your site.
- Safety Interlock Schematic (4-67581-01)



SECTION III. TECHNICAL SPECIFICATIONS

Width	48 in. (121.92 cm)
Height *	36 in. (91.44 cm)
Depth	36 in. (91.44 cm)
Weight **	225 lbs (102 kg)
Viewing glass	Two optical density greater than 6 at 1064 nm wavelength
Mounting plate	Exhaust cover: Two 4 in. (101.6 mm) ports ½ in. (12.7 mm) thick plate, drilled with holes at intervals 2-in. (50.8 mm). Holes are tapped for ¼-20 UNC-2B screws.

* Not including the height of the leveling mount.

** Approximate weight; weight will depend on actual components mounted in workstation.

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