

Chapter 1 Laser Safety Precautions

Government and industry regulations

Continuum's user information is in compliance with section 1040.10 of 21 CFR Chapter I, Subchapter J concerning Radiological Health published by U.S. Department of Health & Human Services Center for Devices & Radiological Health, 1988 and EN 60825-1, safety of lasers.

The American National Standards Institute (ANSI), a member of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), has published a booklet on laser safety standards. Continuum strongly suggests that all its customers purchase a copy of the American National Standard for the Safe Use of Lasers in order to read and implement necessary precautions. Write or call the publisher listed below for information on obtaining a copy of ANSI Z136.1-1993.

Publisher: Laser Institute of America
13501 Ingenuity Drive, Suite 128
Orlando, FL 32826
Telephone +1(800) 345-2737
FAX: +1(407) 380-5588
E-mail: lia@laserinstitute.org
Web (Internet): <http://www.laserinstitute.org>



CAUTION

Only operators experienced in working with lasers and trained by a Continuum service engineer should use and service this Custom Laser, or the warranty will be voided.

Laser safety precautions

The following is a summary of general safety precautions, which are to be observed by anyone working with the laser. For a complete listing of safety standards see the ANSI booklet listed above.



- This laser equipment must be located in a locked area with access only to authorized personnel. The area must be marked by well-defined warning signs, and off limits to unauthorized personnel.
- Only qualified personnel, who have been trained by a Continuum customer service engineer, may operate this laser equipment.
- This laser equipment must be turned off when not in use.

- Always wear laser goggles appropriate for the wavelength generated and the beam intensity.
- The laser equipment area must be brightly lit so the pupils of the operator's eyes are normally constricted.
- A fire-resistant background should be placed behind target areas.
- Surrounding work areas should be coated with a material that absorbs scattered radiation.
- Operators should not wear or use any object that may reflect laser light such as a watch, ring, pen, etc.
- Tracking individuals, vehicular traffic, aircraft, or any airborne object using laser radiation is prohibited.

Optical safety

- 1) Be sure that the light from the flashlamps is obscured from the eye as it is damaging if viewed directly.
- 2) Eye safety is the greatest concern. Be aware at all times that this is a Class IV laser, the highest and most dangerous classification. Specular reflections from the main beam off a polished surface can cause severe eye damage.
- 3) Be sure that there are no volatile substances in the lab that the laser could ignite.
- 4) Mark the lab well with warning signs when the laser is operating and provide interlocks for all doors.

Electrical safety

- 1) To prevent accidents due to electrical shock, care should be taken to be sure the capacitors are completely discharged and the power turned off before any maintenance or repairs are made to the system. Electric shock and burns resulting from input power or capacitor discharge can cause serious injury or death.
- 2) Be aware that high voltages are present in the laser heads once ac power is toggled on.

Laser emission classification

This Custom Laser is a Class IV Laser.

Protection while working with lasers

When the laser beam is active, there are shutters that cut the beam off, or reduce the intensity of the beam at the Custom Laser output.

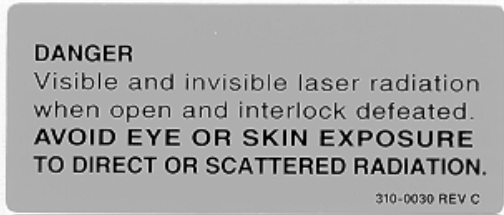
- 1) A shutter at the output of the Custom Laser cuts off the laser beam.
- 2) The Custom Laser has a safety cover over the laser beam area. This cover must be in place during normal operation, and should only be removed while the laser is operating for special procedures only.
- 3) The Custom Laser has a safety interlock that turns off power to all units if the top cover is raised. This cover switch can be defeated using the interlock defeat bracket. Only a fully trained operator should do this.

Additional safety regulation references

- American National Standard for the Safe Use of Lasers, Laser Institute of America, 1993.
- Laser Safety Guide. Laser Institute of America, (9th Edition).
- Electronic Product Radiation Control, Guidance on Electronic Products which Emit Radiation, Center for Device Radiation and Health (CDRH).
<http://www.fda.gov/cdrh/radhlth/indexhtml>
- Guidelines for Laser Safety and Hazard Assessment, PUB 8-1.7, OSHA Directives, 1991

Warnings and labels

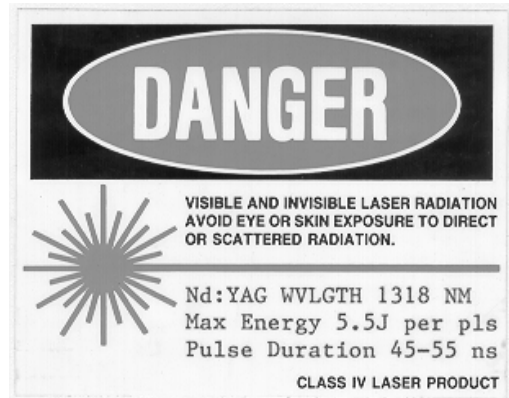
The next page shows some of the warning labels used on the Custom Laser.



Item 1

P/N 310-0030

Found on top surface of covers



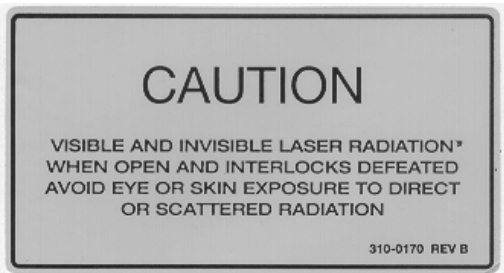
Item 2

P/N 310-0212



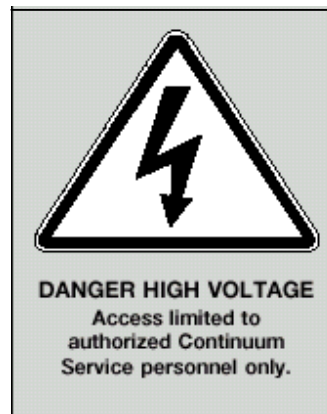
Item 3

P/N 310-0025



Item 4

P/N 310-0170



Item 5

P/N 310-0022

Found on the covers of the control and power units, and capacitor banks.



Item 6

P/N 310-0099

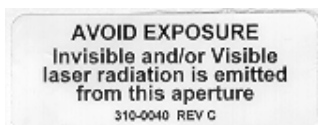
Found on beam dumps inside the laser.



Item 7

P/N 310-0192

Found inside power units on heat sinks, capacitors and 24V power supplies, and on rear panels of control units and cooling groups.



Item 8

P/N 310-0040

Custom Laser warning labels

