



**TELEDYNE**  
**CETAC TECHNOLOGIES**  
Everywhereyoulook™

**LSX-213 G2+ and LSX-266**  
**Laser Ablation Systems**

**Pre-Installation Guide**

Manual Part Number **480204** rev1a

© 2010-2013 Teledyne CETAC Technologies, Printed in USA

## Preparing for Installation

Minimal site preparation is required prior to installing the CETAC LSX-213 G2+ or LSX-266 laser ablation system. Since the laser ablation system is a class 1 laser product, it is installed in the laboratory next to the host instrument without special lockout procedures or isolation. Before beginning installation, evaluate the physical arrangement of the laboratory to choose a suitable location. Once a suitable location has been selected and prepared, installation can begin.

This document discusses what requirements must be met when you choose a location for the laser ablation system. It also describes how to unpack the system prior to installation.

### WARNING

**Do not power-up the laser ablation system before thoroughly reading and understanding operating and safety procedures. Defeating interlocks, removing panels or performing procedures other than those specified may result in hazardous laser radiation exposure and personal injury, laser system damage and void the warranty.**

## Choosing a Location

Choosing a location for the laser ablation system involves evaluating the laboratory environment for the availability of space, electrical power and location relative to the ICP. The laser ablation system is a Class 1 laser product. At no time can the user be exposed to harmful laser light unless deliberate actions are taken to defeat the multiple safety interlocks. If there is an interlock failure at any time, such as the door opening, the laser will immediately turn off. Locate the laser ablation system cabinet to provide convenient access to the sample cell while minimizing the distance between the sample out port and the torch interface on the ICP.

To create satisfactory operating conditions in your lab environment, follow these guidelines:

- Operate the system in a conventional lab environment where the temperature is 50–95 °F (10–35 °C); the humidity is 20–70% non-condensing; and the unit is not exposed to excessive flammable or corrosive materials.
- Avoid rough handling of the laser ablation system. Do not expose the laser ablation system to vibration or shock.
- Protect the system from long-term exposure to condensation, corrosive materials, solvent vapor, standing liquids, liquid spills into the electrical equipment or operation inside an acid hood or glove box. Exposures of this type can degrade the optics, corrode and damage mechanical drive mechanisms, as well as the electronics.
- Observe the same general electrostatic discharge precautions as with any other integrated circuit electronic devices. Low humidity environments, especially when combined with static-generating materials, require maximum care.
- Avoid exposing the system to high levels of electromagnetic or radio frequency interference (EMI/RFI), or radioactivity. EMI/RFI can cause erratic operation, high levels of radioactivity may cause electronic component failure, and will prohibit factory repair if so contaminated.

Contact Teledyne CETAC Technologies for assistance if the system will be required to operate in a hostile environment.

## Space Requirements

The laser system includes a cart. The dimensions of the cart are 44" L x 25" W x 23" H (112 x 63 x 58 cm). With the laser cabinet on the cart, the height is 55". Additional space should be allowed for the coolant and interface lines from the rear, so if the unit is to be backed against a wall, allow 46" (117 cm) for the laser/cart to protrude. An additional 23" x 10" of floor or counter space should be reserved for the power supply. The power supply/cooler can be placed on the cart for mobility, but should be set on the floor once in place to avoid vibrations from affecting high-zoom image quality once the system is running.

The recommended minimum footprint for countertop installation of the laser cabinet is 30d x 20w x 30h inches (77 x 51 x 77 cm), with no obstructions in front of, behind, or above the unit.

The sample out line exits the laser cabinet from either the left or right side. This will be pre-configured based on the user's ICP. However, the sample out fitting can be moved from one side to the other by swapping the bulkhead fitting and the plug from one side to the other.

Allow at least 5 cm clearance on all sides of the instrument for ventilation.

Keep in mind that the cables and tubing could create a trip hazard, especially to the rear of the laser cabinet. Place the laser ablation system away from high-traffic walkways.

## Electrical Power Requirements

Place the system within 2 meters of a power outlet. The laser power supply should not be connected to a Ground Fault Interrupt (GFI) plug. Some current may trickle to ground during normal operation which would trip the GFI circuit. The circuit must be capable of supplying 20A (at 120 V AC). The laser ablation system's power input requirements are as follows:

---

<b>Power Supply (Desktop "Brick" Transformer)</b>	<b>Input:</b> AC Voltage, Current, and Frequency 100-250 V AC $\pm$ 10% ~ 3.2 A 47-63 Hz Installation Category: CAT II (Line voltage in appliance and to wall outlet) <b>Output:</b> 24 V DC, 5.41 A max
<b>Laser Cabinet</b>	<b>Input:</b> Connector is labeled DC POWER IN DC Voltage and Current — — — 24 V 5.41 A Installation Category: CAT I (Mains isolated) Use only with the provided desktop "brick" transformer. Laser is powered independently.

---

**Laser Power  
Supply/Cooler**

**Input:**

AC Voltage, Current, and Frequency

100-240 V AC ~

< 10/5 A

50/60 Hz

Installation Category: CAT II (Line voltage in appliance and to wall outlet)

**Output:**

Connect only to the laser cabinet.

**Subject to change without notice. See the documentation that accompanies the power supply for power requirements.**

---

## Fuses

The fuse requirements are:

- Laser Power Supply 5 A. Type 3AG "Slowblo" (used by the cooler/power supply)

**WARNING**

**Replace fuses with specified type(s) and rating(s) only.**

**WARNING**

**DANGER - HIGH VOLTAGE. Both the laser head and laser electronics unit contains electrical circuits operating at lethal voltage and current levels. Always unplug and wait at least one minute to allow capacitors to bleed down before servicing any part of the laser system. Call Teledyne CETAC Technologies Customer Service if power system-related problems occur.**

## Computer Requirements

A computer is supplied with the laser ablation system. This computer has been verified to work with the system, and the DigiLaz G2+ software is pre-installed.

If you supply your own computer (for example, if you wish to use a computer which has already been set up to run your ICP), it must meet the following requirements:

- Operating System: Microsoft ® Windows 7.
- Processor: Dual Core, 3.3 GHz minimum clock speed
- System Memory: 2.0 GB of RAM minimum
- Video resolution: 1280 x 1024 minimum
- I/O: LSX-213 G2+: Two available USB ports.

LSX-266 : One available USB port and one available PCI slot.

## Gas Requirements

The LSX-213 G2+ is designed to use helium as the sample carrier gas, with an optional secondary argon carrier gas. The laboratory should be able to accommodate two full size compressed gas tanks (one helium tank and one argon tank) or have other provisions for supplying gases to the laser system. The recommended gas supply pressure is approximately 40 psi (measured at the input to the built-in mass flow controller). The LSX-266 uses argon alone (supplied from the connected host ICP/ICP-MS), and does not require a helium supply.

Included in the completion kit is 1/8" OD tubing and two 1/8" Swagelok® tube fitting to 1/4" NPT adapters to connect the tubing directly to the regulators on the gas tanks. In the event that external gas supplies will not be used, the laser system will use argon from the host ICP nebulizer gas line. Fittings and tubing are also provided to connect the ICP nebulizer gas port to the laser.

Typically, both helium and argon are used with the LSX-213 G2+, where helium is the carrier gas and argon is "make up" gas to provide optimum performance.

## Power Cord Set Requirements

The power cord set supplied with the system meets the requirements of the country where you purchased the instrument. If you use the instrument in another country, you must use a power cord set that meets the requirements of that country.

### WARNING

**This equipment is designed for connection to a grounded (earthen ground) outlet. The grounding type plug is an important safety feature. To reduce the risk of electrical shock or damage to the instrument, do not disable this feature.**

## Unpacking the Laser Ablation System

The system has been carefully packaged for shipment in one crate. The crate contains the laser ablation system cabinet, laser power supply and installation accessories. A utility cart is strapped to the lid of the crate. The utility cart is used to hold the laser ablation system. This allows easy movement within your laboratory space and it is useful if the system will be installed on multiple ICP systems.

Carefully inspect external packaging immediately upon receipt for holes, tears, smashed corners, or any other outward signs of damage from rough handling or abuse during shipment.

If any damage is evident, immediately file a claim against the carrier and notify Teledyne CETAC Technologies. Examine all items during unpacking with a factory-authorized representative, and notify the carrier immediately of any concealed damage.

If the system is shipped or removed from storage during cold weather, allow the packaged equipment to attain room temperature before opening and exposing to warm, humid air. It is usually sufficient to provide 4 to 8 hours for this purpose.

### WARNING

**If condensation forms on or inside the laser ablation system, allow it to dry thoroughly before connecting it to an AC power source and operating it. Failure to do so may cause personal injury or equipment damage.**

## Laser Ablation System Packaging

The shipping crate contains:

- LSX-213 G2+ or LSX-266 Laser Ablation System
- Laser Power Supply
- Cables and Connectors
- Cart
- Completion Kit with tubing and fittings
- PCI card for installation into the host computer (LSX-266 only)
- Software install CD and manual

Remove the packing list from the container and check-off items against it as they are removed. Leave the cables and other accessories in their container until you and the CETAC service representative are ready to install them on the laser ablation system and the host ICP or ICP-MS. Contact Teledyne CETAC Technologies immediately if any shortages or packing list discrepancies are found.

You can arrange for a factory-authorized Service Engineer to install the laser ablation system.

### **NOTE**

Do not throw away the factory packaging. Keep it for possible future use if you need to ship the laser ablation system or return it for service.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Swagelok is a registered trademark of Swagelok Company.