



Pre-Installation Guide

InSight[®] X3[™]



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SPECTRA-PHYSICS LASERS

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Introduction

Thank you for purchasing a Spectra-Physics® InSight® X3™ Laser. This pre-install guide provides instructions to prepare your laboratory for delivery and installation of the laser. We hope that it is able to answer many of the questions that you may have regarding the laboratory requirements, installation procedures, and maintenance.

This guide is meant to be an additional resource in addition to the InSight X3 User's Manual. It outlines the main requirements necessary before the laser is delivered. The User's Manual contains all the necessary laser safety, compliance, control, and operation information. If there are any additional questions please ask one of the members of the Spectra-Physics team.

When your laser is ready to ship you will receive a call or email from one of our customer service engineers to plan out the delivery and installation of the system by one of Field Service Engineers. Please follow the steps outlined to properly plan for the installation. Important items include the operating environment, power, computer control, and physical space. A detailed checklist in Section 2 shows the necessary considerations. These requirements must be met prior to installation, and consideration should be given to all applicable building and safety codes.

We at Spectra-Physics intend to give you responsive and thorough service. For US Customers, the service team is available at 1-800-456-2552 or service@spectra-physics.com for any questions. For worldwide support please refer to <https://www.spectra-physics.com/company/contact/> or the InSight X3 user's guide table 8-1.

Best Regards,

Spectra-Physics/MKS Sales, Service, and Product Management teams

1 – Installation Location and Environment

The location of the system and environment of your laboratory should follow these guidelines:

- A. A safe location that meets all applicable building codes.
- B. Easy access around the laser for service personnel to perform maintenance.
- C. An optical table that will meet the space requirement for both the laser and instruments to be installed.
- D. Proper environmental HVAC controls including air conditioning and heat are important to keep a stable environment. Air ducts should not blow directly on laser or optical path.
- E. To ensure stable day-to-day operation, please follow the recommended operating conditions below. The ideal room temperature is 22°C with fluctuations less than $\pm 1^\circ\text{C}$ during any two-hour period
- F. In most applications, vibration isolation is required and structural integrity of the floor will impact system performance.
- G. The laser head weighs close to 200 Pounds and is required to be mounted to a sturdy and stable optical table. Two or more people are required to lift the laser on to the table.

1.1 Physical Description

Dimensions and Weights

Unit	In. (L,W,H)	Cm. (L,W,H)	Lb.	Kg.
Laser Head, InSight® X3™	35.8 x 19.8 x 7.3	91.0 x 50.2 x 18.4	185 lb	84 kg
Model IPS300 Supply	17.90 x 19.00 x 6.9	45.5 x 4.83 x 17.5	28 lb	13 kg
Umbilical Length	10 ft	3m		
ThermoRack 401 Chiller	20.0 x 19.0 x 10.5	50.8 x 48.3 x 26.7	49.5 lb	22.5 kg

Please refer to the InSight X3 user manual for outline drawings of the laser head, power supply, chiller, and rack.

1.2 Environmental Requirements

Feature	Specification
Altitude	Up to 2000 m

Temperature, operating	20 °C to 25 °C
Relative humidity, operating	Maximum 75% noncondensing, up to 25 °C
Temperature, storage	20 °C to 25 °C
Relative humidity, storage	< 65% for 15°C to 35 °C
Cooled water temperature in closed-loop chiller	21°C typical ¹

1. Avoid obstructing the air exhaust grills which will result in the recirculation of hot exhaust air. Cooling air enters through the front panel and exits through the rear fan apertures.

1.3 Utility Requirements

Chiller and Cooling Liquid

The InSight® X3™ has a closed-loop liquid cooling system and requires no utility water services. Use ONLY full-strength Nalco Coolant (P/N 1607-0546) that contains corrosion and bacterial/algal growth inhibitors. It is included in the InSight X3 crate. **Never use deionized water, it can cause damage to the laser.** Fill the chiller reservoir following the instructions in the chiller manufacturer's user manual.

The chiller should be placed below the laser in a position where if a leak were to develop it would not damage the laser or other components on the optical table. The chiller must always be on when the power supply is on, even if the laser is not running.

Electrical Power Requirements

It is recommended to connect the laser and chiller on separate AC power circuits.

Unit	Maximum Power Requirement
IPS300 Power Supply	100 – 120 V~/ 10 A max. 200 – 240 V~/ 6 A max. 50 / 60 Hz
ThermoRack 401 Chiller	100 – 240 V~ / 9 A max. 50/60 Hz

Room Temperature (°C)	Typical Heat Generation	Maximum Heat Generation
20 °C	775W	1050W
25 °C	1100W	1350W

1.4 Computer Requirements

Two modes of control are offered for the standard InSight® X3™ system:

- A. InSight graphical user interface (GUI) control software for use on a Windows® based computer. For more information on the control software, refer to the user manual. In order to run the GUI control software, the control computer must meet these minimum requirements:
 - Intel or AMD 32 or 64-bit, single or multi-core processor with > 1 GHz clock speed
 - 1 GB RAM
 - 32MB available disk space for installation
 - a CD-ROM or DVD-ROM drive
 - a mouse or other Windows®-compatible pointing device
 - a video display with 1024 x 768 (SVGA) or higher resolution
 - an available USB port
 - Microsoft Windows 10®, Windows 7®, or Windows XP® operating system
- B. Serial commands that can be sent to the Insight laser through a RS-232 or USB connection. For more information on the commands, please refer to Appendix A: Programming Guide in the User's Manual.

2 – Pre-Installation Checklist

Physical Location:

- A location with adequate clearance around system to conduct service and accessible by Spectra-Physics® personnel.
- A temperature controlled room.
- Utility services have been installed.
- Local building and safety codes are in compliance and have been verified.

When Your System Arrives:

Upon receiving your system, immediately inspect the outside of the shipping containers. If there is any sign of damage, immediately call Spectra-Physics and file a claim with the carrier.

- The InSight® X3™ crates have been designed to sustain some physical damage.
 - If the crate is externally damaged, or any of the shock or tilt indicators show damage please file a claim with the carrier and notify Spectra-Physics.
- The InSight X3 laser is designed to be installed on site by a factory-trained installation engineer. Do not open the laser packaging prior to the engineer’s arrival unless specifically told to do so by the factory.
- Uncrate and place the system on your work surface.
 - Two or more people will be required to lift some equipment.
- Compare the packing list with your quotation. Call your Spectra-Physics office about any discrepancies.
- Check that all manuals were received on the included USB drive.
- Save all packing and shipping material until the installation has been completed.
- Obtain the proper safety glasses and a power meter if installing the laser system
- Read the user manual sections titled Receiving and Inspection and Chapter 4: Installation

Customer Signature

Date

Phone Number

Fax Number

E-Mail

Sales Order Number

3 – When the System Arrives

3.1 Inspection

When the system arrives, any sign of damage to the shipping crates should be brought to the attention of the delivering freight company and noted on the invoice before signing the invoice. A claim must be filed with that commercial carrier (usually within 30 days). Notify the originating Spectra-Physics® office of any shipping damage. Shipping damage is not covered by Spectra-Physics.

Your packing list will show all items that you have ordered. Open all the packages and check each item for possible damage during shipping. Check the items against your packing list. Some items may have been installed at the factory. Please report any missing or damaged items to Spectra-Physics.

3.2 Review Instruction Manuals

Please review the InSight® X3™ user manual to familiarize yourself with the laser system. This is located on a USB drive included in the shipment and can also be sent electronically by Spectra-Physics Sales and Service personnel. In particular, please refer to Chapter 4 of the user manual for more information on installation.

3.3 Laser Safety Considerations

In addition to reviewing the sections in the manual regarding laser safety, be sure to have the proper safety glasses available for all lab personnel present during the installation of your system. For more information on laser safety please refer to Chapter 2 of the user manual, contact Spectra-Physics, or your in-house laser safety officer.

3.4 Diagnostics

During the course of installation, power measurements will be demonstrated on all of the appropriate wavelengths. Your Customer Service Engineer can identify which specifications will be demonstrated and the equipment necessary to conduct such tests. A non-standard system will require special consideration.

To have other published specifications demonstrated, consult with your Customer Service Engineer to determine whether additional diagnostic equipment will be required.

Basic diagnostics equipment such as power meter and spectrometer are required to operate and maintain the laser systems. We recommend that you obtain this basic diagnostics equipment before the system is installed.

4 – Maintenance

Standard maintenance is necessary for standard operation of the InSight® X3™ laser system and to maintain both standard and extended warranties. Detailed below are some of the standard maintenance procedures; for a more detailed explanation please refer to the user's manual. Failure to perform standard maintenance procedures may result in the warranty being voided.

4.1 Laser Head Maintenance

There is no regular maintenance needed for the InSight X3 laser head.

4.2 Thermo Rack 401 Chiller Maintenance

Chiller Fluid

The Chiller should be fully filled with the Nalco circulating solution and checked regularly. Insufficient cooling could cause a decrease of performance or a shutdown of the laser system. It is recommended to keep the chiller on and running full time to shorten turn on time.

Nalco Mixtures

The Nalco circulating solution (P/N 1607-0546) is a premixed liquid corrosion inhibitor, bacterial growth inhibitor, and cooling liquid designed for use in the closed closed-loop cooling system on the InSight X3 Laser System. It should be replaced every 6 months following the procedure in the user manual. Please dispose of the Nalco mixture properly following the MSDS located in the user manual.

The Nalco Cleaner solution (P/N 1607-0547) is used to flush and clean the laser system of ferrous metals and copper alloys as a result of corrosion. An annual maintenance including flushing of the cooling lines with Nalco Cleaner is suggested. The cleaner should be circulated for a minimum of 8 hours (the longer the better if time permits in order to assure thorough cleaning).

4.3 IPS-300 Power Supply Maintenance

The IPS-300 is not user serviceable. It includes a purge system that removes humidity from the laser cavity. The purge filter (P/N 2200HT-ETN) should be replaced when the humidity in the system rises above 10%. In most environments this will be longer than one

year.

Regularly inspect the input air filter on the power supply for a buildup of dust and debris. If dirty, remove the filter and wash it in clean water. Operating the laser in a clean environment will provide for the longest filter lifetime.

4.4 General Procedures

The Chiller, output power, and general performance of the laser system should be checked regularly. If any of the output characteristics have changed please call Spectra-Physics® Technical Support at 1-800-456-2552, or call your local customer service or sales engineer. A list of global service centers is located at <https://www.spectra-physics.com/company/contact/> and in Chapter 8 of the User's Manual.