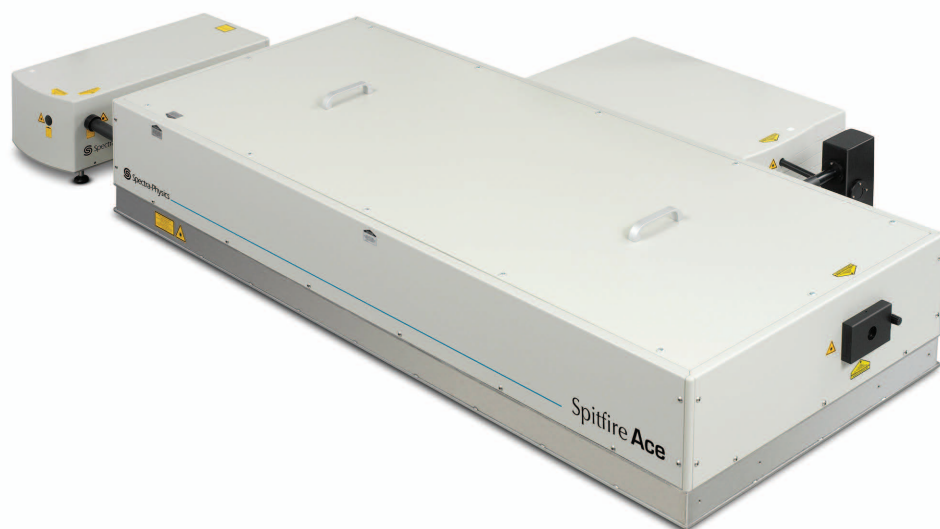


## Pre-installation Guide for Ultrafast Amplifiers

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## Introduction

Congratulations on your purchase of a Spectra-Physics system. This guide describes pre-installation information for your laser system.

Some preliminary planning is essential to avoid unnecessary delays during installation and to ensure easy operation and access to your system. You are requested to carefully consider your operating environment prior to installation. Proper water, power and room temperature are required for each system.

A checklist of pre-installation considerations is provided in this guide. You are responsible for meeting these requirements prior to installation, with due consideration given to all applicable building and safety codes.

We at Spectra-Physics intend to provide you with responsive support so that you can derive great satisfaction and value in using our systems for your applications. We are available to you at **1-800-456-2552**.

## When the System Arrives

### 1.1 Inspection

When the system arrives, any sign of damage to the shipping crates should be brought to the attention of the delivering freight company. 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.

Each major component of the Amplifier system comes with a manual, verify that you have received these items. Some manuals are now electronic only.

Please report any missing or damaged items to Spectra-Physics, or you may contact your Spectra- Physics Sales Engineer.

### 1.2 Review Instruction Manuals

Please read the manual to get vital information about your system. Familiarize yourself with the system. You are encouraged to spend as much time as possible reviewing the system components before your Spectra-Physics Service Engineer arrives for the installation and training.

### 1.3 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 and testing of your system. For more information, please call Spectra-Physics at 1-800-456-2552.

Ultrafast laser systems consist of multiple class 4 lasers and laser harmonic generation units. Proper understanding of the wavelengths and energy levels of any option is required. The setup and operation of any laser laboratory is subject to Federal and State regulation. Be sure to follow all applicable laws and regulations in the setup and operation of your system.

### 1.4 Diagnostics

During the course of installation, power measurements will be demonstrated on all of the appropriate wavelengths. Your Service Engineer can identify which specifications will be demonstrated and the equipment necessary to conduct such tests. A non-standard system may require special consideration. To have other published specifications demonstrated, consult with your Service Engineer to determine whether additional diagnostic equipment will be required.

Daily operation of a regenerative amplifier requires a dedicated oscilloscope with a minimum of 300MHz analog bandwidth or a digital scope with a minimum of 4Gs/s sample rate with a 500MHz front end. An appropriate power meter and spectrometer are basic diagnostic tools.

## Pre-installation Considerations

### 2.1 Location and Environment

The location of the system and environment of your lab should have the following features:

- A. A safe location that meets all applicable building codes.
- B. Easy access with adequate clearance around the instrument.
- C. Proper air conditioning could be critical for the performance of the laser. For certain applications ambient room temperature changes may be an important factor for the laser system's performance. Air ducts should not blow directly on laser or optical path. This laser system is meant for indoor use

Altitude: up to 3000 m  
 Temperatures: 18degC to 28degC  
 Maximum Relative Humidity: 85% at 18degC decreasing to 45% at 28degC to maintain a non-condensing humidity.  
 Mains supply voltage: do not exceed +/- 10% of the nominal voltage  
 Insulation category: II  
 Pollution degree: 2

The system's optical table should not be directly under any active heating or air conditioning vent. In general, we recommend having a shelf above the optical table to place the power supplies and diagnostic oscilloscope and to have the chillers away from the optical table, in a separate room if possible. Longer hoses are available for the systems' chillers. Check with your sales engineer to be sure hoses of the appropriate length have been ordered with your system.

- D. In some applications vibration isolation may be required for your system. Structural integrity of the flooring could play an important role.
- E. Please note that an Amplifier system must be installed on a proper optical table.
- F. Consider room requirements for future maintenance and upgrades by your Spectra-Physics Field Service Engineer as well as the safety of the system's operators.

### 2.2 Physical Description

Amplifier	Height	Width	Length	Weight (lbs)
Solstice	10.5"	27"	49"	480
Solstice Umbilical length			12'	
Spitfire ACE	9.36"	24.0"	60"	400
Spitfire ACE Umbilical Length		(x2)	9.5'	
Spitfire ACE PA	9.36"	30.0"	60"	400
Spitfire ACE PA Umbilical Lengths		(x3)	9.5'	
Empower *	Height	Width	Length	Weight (lbs)
Laser Head	7.0"	10.0"	19.75"	50
Power Supply	6.9"	17.9"	19"	45
Umbilical Length		10'		
High Capacity Chiller	22.7"	14.5"	27.7"	189
Standard Empower hose lengths are ~ 2 M.			5 and 10 M hoses are available	
Mai Tai *	Height	Width	Length	Weight (lbs)
Laser Head	5.8"	13.8"	23.4"	70
Mai Tai Power Supply	6.9"	17.9"	19.0"	55
Umbilical Length		10'		
Chiller	22.7"	14.5"	27.7"	189
OPA	Height	Width	Length	
Topas	6.6"	8.7"	22.8"	
OPA 800c	9.3"	24"	36"	

## Pre-installation Considerations

\* Part of Solstice, external to Ace

A Spectra Physics regenerative amplifier has a TDG timing delay generator control unit and a TCU temperature control unit (2 TCUs for an ACE PA) and a control computer associated with it. Each Empower has a control computer and High Capacity Chiller. The TDG, and the TCU(s) are standard rack mount 17.9" x 19" x 3.5" boxes. Spectra Physics Amplifier Systems come with laptops preloaded and tested with the proper GUIs and all required cables. Spectra Physics will try to support but does not guarantee any other control scheme.

### 2.3 Amplifier Utility Services

Each Spectra-Physics laser system has its own water, electrical, nitrogen and room air requirements. To ensure smooth uninterrupted operation, each system should have dedicated utility services. All chiller cooled lasers specified here not using the special Nalco cooling solution require steam-distilled water to be provided on site at installation. Nalco is required for Empower chillers. In the United States, the Empower High Capacity Chillers require a NEMA 5-20R T slot receptacle. All other power supplies, chillers and control units can use standard NEMA 5-15R receptacles. We recommend using a separate circuit for each power supply and chiller and at least one other circuit for the control units. NEMA 5-20R T receptacles work with both types of plugs that come with the system. Take into account the layout of your system when planning the utilities for your lab. Electrical drops that minimize cords stretching across the floor are highly recommended to protect the safety of the system operators and to protect the equipment from unintended power interruption or misalignment.

*Please be aware that a Spectra-Physics service engineer cannot perform electrical or plumbing work at your site.*

#### Electrical Services

Before connecting the power supply to the AC power line, make sure that all power supply power switches are **OFF**.

Model	Ø	Voltage Nominal	Current Maximum
TDG/TCU	1Ø	110/220V	2A
OPA 800C	N/A	N/A	N/A
Topas	1Ø	110/220V	2A
Empower 15/30/45	1Ø	110/220V	15A/10A
High Capacity Chiller	1Ø	110/220V	20A/15A
Mai tai	1Ø	110/220V	15A/10A

### 2.4 General Specifications

Up to date specifications for any Spectra Physics laser system are always available from the Newport web site: [WWW.Newport.com](http://WWW.Newport.com). Enter the model as a keyword to be taken to the newest Specification Sheets.

You can also contact your Newport Spectra Physics Sales Engineer or Spectra Physics Service Support to answer any questions regarding your system by calling **1-800-456-2552**. We are here from 7:30am to 4:30pm Pacific time. You can send an e-mail at any time to [Service@Spectra-Physics.com](mailto:Service@Spectra-Physics.com) and we will get back to you the next business day.

## Pre-installation Considerations

### 2.5 Useful SP part numbers for Ultrafast systems

1607-0456	Nalco solution 1 US gal	
1607-0547	Nalco cleaner 1 US gal	
2604-0493	Empower Chiller filter	
90019175	MaiTai / Tsunami floor chiller filter	
2604-0490	MaiTai rack mounted chiller filter	
90029851	5M hose assy laser out	M-M
90029853	10M hose assy laser out	M-M
90029852	5M hose assy laser in	M-F This can be used as an extension
90029854	10M hose assy laser in	M-F This can be used as an extension
90035539	MaiTai Purge Filter	
0135-1923S	TCU Purge filter	
90048754	Activated Charcoal 12 pack	

The chiller filters and fluids must be changed on an annual basis.

The purge filters on an as needed basis.

## Pre-Installation Checklist

Before the arrival of your Spectra-Physics Service Engineer please review the following pre- installation requirements. When all the requirements have been met, initial the boxes and fax a signed copy to the Spectra-Physics Service department at **(408) 980-6921**.

### 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:

- Check crates for damage.  
(If damaged, file a claim with the carrier and notify Spectra-Physics.)
- Uncrate and place the system on your work surface.  
(Two or more people may 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.
- Save all packing and shipping material until the installation has been completed.
- Obtain the correct safety glasses, oscilloscope and a power meter.

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**Customer Signature**

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**Date**

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**Phone Number**

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**Fax Number**

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**E-Mail**

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**Sales Order Number**