Pre-Installation Guide
for
Tsunami

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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

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.

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.

Diagnostics

During installation, power measurements will be demonstrated on all 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 will require special consideration.

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

Location and Environment

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

B. A safe location that meets all applicable building codes.

C. Easy access with adequate clearance around the instrument.

D. 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.

E. In some applications vibration isolation may be required for your system. Structural integrity of the flooring could play an important role.

F. Please note that the laser head required a sturdy breadboard or optical table.

G. Some optics sets in the Tsunami require nitrogen purging. Electronic Grade 5, oil free, dry nitrogen is required.

When the System Arrives (Continued)

Location and Environment (Continued)

H. Heat producing items (e.g., chiller, power supply, etc.) should not be placed under the optical table. If there is no other option, one or more fans should be placed under the table to remove the heat.

I. Straight-in pumping of the Tsunami is recommended but, if space is limited please discuss the layout options with your Spectra-Physics service engineer before scheduling the installation. Routing mirror(s) and associated beam tubes would need to be ordered to configure the system. However, the long-term stability integrity of the system may be compromised.

J. Consider room requirements for future maintenance and upgrades by your Spectra- Physics Field Service Engineer.

Physical Description

Dimensions and Weights

Unit	Dimensions		Weight	
	In. (L, W, H)	Cm (L, W, H)	Lb.	Kg.
Tsunami Models				
3941 / 3941C	32.0 x 12.3 x 9.0	81.3 x 31.1 x 22.9	78	35.38
3950 / 3950C	32.0 x 12.3 x 9.0	81.3 x 31.1 x 22.9	78	35.38
3960 / 3960C	32.0 x 12.3 x 9.0	81.3 x 31.1 x 22.9	78	35.38
Accessories				
3910	6.8 x 10.1 x 5.4	17.3 x 25.7 x 13.7	5.2	2.36
3930	14.3 x 17 x 4.3	36.32 x 43.18 x 11.0	16.2	7.35
3955	14.3 x 17 x 4.3	36.32 x 43.18 x 11.0	15.8	7.17
3980	16.7 x 12.24 x 8.59	42.4 x 31.09 x 21.81	34	15.5
3986	14.37 x 17 x 5.71	36.5 x 43.3 x 14.5	20.7	9.41
3983	11.0 x 8.0 x 6.03	27.94 x 20.32 x 15.32	7	3.18
Chiller M-25	20.2 x 12.7 x 23.9	51.3 x 32.3 x 60.7	150	68

General Specifications

Water

The Tsunami is a closed loop water cooled system and requires no utility water services. Do not place the chiller above the laser. Should the unit not be installed properly, and a leak develops, dripping w a t e r may damage one or both lasers. The hoses are 3.6 M (12ft) long. Connect the Chiller output first to the Millennia, from the Millennia to the Tsunami then back to the chiller. You may have the newer model Millennia eV that comes with cooling hoses that splits in parallel to cool both components.

Power Requirements

Electrical

Type	**3955/3930**[1] Single Phase[2]	**3955/3930**[1] Single phase[2]	**Chiller** Single phase[2]
Voltage	110 VAC	220 VAC	110 / 220 VAC
Current	<1A	<0.5A	10A

Footnote:
1 – With optional Lok-To-Clock configuration.
2 – With earth ground.

Power connections

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

SPECTRA-PHYSICS' SERVICE ENGINEERS CANNOT PERFORM ELECTRICAL OR PLUMBING WORK AT YOUR SITE.

Final Check:
Upon the completion of the installation of utilities, verify that the services meet all building safety codes.

General Specifications (Continued)

Nitrogen Purge for Tsunami

The Tsunami head is sealed so it can be purged. The Model 3910 regulator/filter purge unit is provided for filtering and drying bottled nitrogen gas. Purging the laser cavity with this gas not only eliminates the typical problems associated with dust and contamination, but also prevents tuning discontinuities caused by oxygen and water vapor. Reduction of the latter is important for operation in the long wavelengths.

- Model 3910 Pressure range is a maximum of 67 kPa (10 PSI).
- Input from dry nitrogen gas supply should be limited to a pressure of 67 kPa (10 lbs. per square inch.
- Do not connect the Model 3910 to a gas source with a pressure greater the 80 kPa (12 PSI) or damage to the filters will result.

Use the 3.6 m (12ft) PTFE purge line provided to connect the model 3910 to the laser head.

Note:
Electronic Grade 5, oil free, dry nitrogen is required.

Maintenance Agreement

To maintain a valid warranty on your Spectra-Physics system, it is necessary for the customer to assume the responsibility and perform the routine maintenance program. Failure to do so may result in the warranty being voided.

Nalco Mixture

The Nalco Cleaner (P/N 1607-0547) is used to flush your system clean of ferrous metals and copper alloys because of corrosion. It is recommended as a maintenance procedure that the chiller/critical cooling loop in each piece of equipment is cleaned and treated 1x per year. The laser does not have to be lasing. The cleaner should be circulated for a minimum of 8 hours (the longer the better if time permits to assure thorough cleaning).

The Nalco Solution (P/N 1607-0546) is a premixed liquid corrosion inhibitor designed for use in closed loop cooling systems. It can be added directly to a closed cooling system (used in place of water); resulting in a proper treatment without dilution for up to 6 months (even if the pink tracer turns clear). This solution is a complete inhibitor that protects ferrous metals and copper alloys from corrosion. It is nitrite free and minimizes the challenge of bacteria control (depending on environment and usage). If the laser is not going to be used for an extended period, turn off the laser and drain the water or cooling solution.

Regularly inspect filter on the power supply for any buildup of dust. If dirty, remove the filter and wash it in clean water. The rate at which the filter becomes more restrictive is mainly dependent on the cleanliness of the environment.

*NOTE: to restrict the growth of algae in the reservoir, it is recommended that the reservoir cover be kept in place and that all circulation lines be opaque. This will eliminate the entrance of light that is required for the growth of most common algae.

Chiller Fluid

The chiller fluid level should be appropriate for the model laser and must meet Spectra- Physics specification requirements. Insufficient cooling could result in a decrease of performance or damage to the laser system.

CAUTION: DO NOT USE DEIONIZED WATER

General Procedures

The chiller operation of the laser system should be checked once a week. The power output and the mode-locking of the system should also be checked once a week by verifying the output values.

If any of the output characteristics have changed, please call Spectra-Physics Technical Support at **1-800-456-2552.**

Required Maintenance

Proper safeguards must be used when working with, or around the laser. The Mai Tai is a Class 4 laser that can cause serious skin and eye injury. We recommend you contact a Laser Safety Eyewear vendor that can offer proper personal protection equipment for the tunable wavelength outputs detailed in the specifications in your test summary.

Laser measurement equipment

The following equipment should be on hand when installing, or maintaining the system:

- Infrared (IR) viewer, such as FJW *Model "Find-R-Scope"*
- A spectrometer with the appropriate software, such as Ocean Optics *Model USB2000+* spectrometer with grating #H4 (600 lines/mm, wavelength range 680- 1080 nm, 400 nm spectral range) with slit width of 25 μm and 400 μm NIR fiber with *Model CC-3 VIS/NIR* opaline glass cosine corrector.
- Power meter and sensor are required to measure the laser output, such as the Ophir Juno+ USB Interface and sensor. BeamTrack series 10A-PPS laser measurement sensor is adequate to measure the optical power.
- The StarLab application together with an Ophir meter turns your PC or laptop into a full-fledged laser power/energy meter.

Accessory Kit

Included with the laser system is a user's manual, a test summary, a packing slip listing all the components shipped with this order, and an accessory kit containing the following items:

- Hardware for mounting the *Tsunami* laser head to an optics bench.
- AC power cords and required coolant plumbing.
- System Test Summary Datasheet.

Preventative Maintenance

To keep your laser at optimal performance, the following steps should be taken approximately every 6 months:

- Check that Millennia pump in Tsunami is making rated power at 100% current.
- To ensure pump is optimal, perform SHG temperature tuning as described in Millennia User's Manual.
- Chiller water and filter should be changed, and air filters should be cleaned.
- Verify that the chiller is set to the appropriate temperature, and good coolant level.

Reference the Tsunami User's manual, as well as the Millennia User's manual to optimize the performance of your system. It is recommended you read the manuals before operating the laser system.

Pre-Installation Requirements

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 comply 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 and a power meter.

Customer Signature _____ Date _____

Phone Number _____ Fax Number _____

E-Mail _____ Sales Order Number _____