

ELEMENTAL SCIENTIFIC INC.



PC³_{LT} Peltier Cooled Cyclonic Chamber

Installation/Operation Guide

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Introduction

The PC³_{LT} controls the temperature of the sample introduction system. This results in improved precision and reduced oxide interferences.

Some of the benefits of using the PC³_{LT} include:

- Reduces solvent loading

- Minimizes Polyatomic interferences

- Reduced cost by not having to purchase an external chiller system

- Improved stability

- Reduced sample and skimmer cone cleaning

- Improved rinse out cycle times



Preparing for Installation

Power Requirements

The PC³_{LT} needs to be within 1.5 meters of a power outlet. The voltage input requirements are 100-240 VAC +/- 10%, 47-63Hz, 1.9A.

Power Cord Set Requirements

The power cord supplied with the PC³_{LT} meets the requirements of the country where you purchased the system. Always use approved power cords to prevent possible injury or electric shock.

Space Requirements

The PC³_{LT} requires space approximately 23cm x 16cm x 18cm (LxWxH).

ICP Requirements

Your ICP should be in proper working order before installing the PC³_{LT}.

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Installing the PC³_{LT} Hardware

The PC³_{LT} is very simple to install and can be completed in just a few minutes. Carefully remove the PC³_{LT} from the packaging and place on a stable bench or cart.

If the PC³_{LT} is already assembled, skip to step 7 to complete installation.

Spray chamber assembly

1. Attach the drain line to the bottom drain port on the cyclonic spray chamber by screwing the ¼-28 nut with waste line firmly in place (Figure 1).
2. Insert the drain line through the opening on the PC³_{LT} cyclonic holder (Figure 2).



Figure 1. Installing waste line onto spray chamber Figure 2. Inserting drain line into cyclonic holder

3. Insert the cyclonic spray chamber into the spray chamber holder (Figure 3). Be careful to position the nebulizer port of the spray chamber into the cutout portion of the holder.
4. Slide the inner insulation ring over the arm of the cyclonic spray chamber and position it in the recessed area over the spray chamber (Figure 4).



Figure 3. Inserting the spray chamber

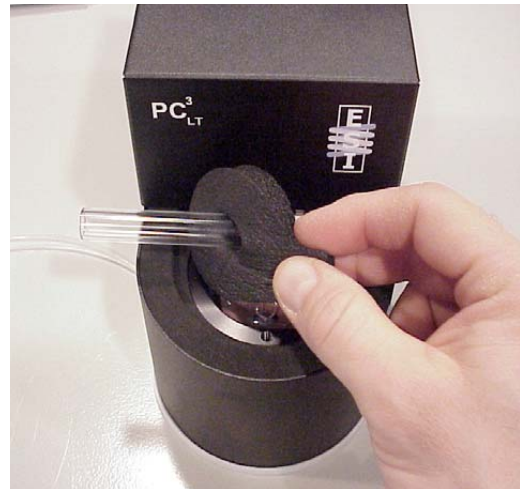


Figure 4. Inserting the inner insulation ring

5. Slide the outer insulation pad over the arm of the cyclonic spray chamber and position it over the inner pad of insulation (Figure 5). If there is a factory-installed Teflon connector on the end of the outlet, the insulation pad will have to be carefully stretched over the connector.



Figure 5. Inserting the outer insulation ring



Figure 6. Installing enclosure cover

6. Place spray chamber enclosure cover over the insulation pads (Figure 6). Secure the cover with the thumbscrew and be careful not to over tighten the thumbscrew (Figure 7).
7. Connect the power supply to the PC³_{LT} by inserting the 12VDC plug into the power receptacle on the back of the unit (Figure 8). Twist the lock ring clockwise until the locking mechanism engages and the power cord is secure. Be sure to plug the switching power supply into an outlet before operation. Remember to use only an approved power cord for your country.



Figure 7. Secure cover with thumbscrew



Figure 8. Attaching power supply to PC³_{LT}

8. Connect the arm of the cyclonic spray chamber to the ICP's injector (press fit or ball/socket depending on the instrument configuration).
9. Insert the nebulizer into the PFA adapter fitting (Figure 9) and secure by tightening the adapter.
10. Attach the uptake and argon lines to the nebulizer and set to manufacturer's settings (Figure 10). Installation is now complete.



Figure 9. Installing the nebulizer

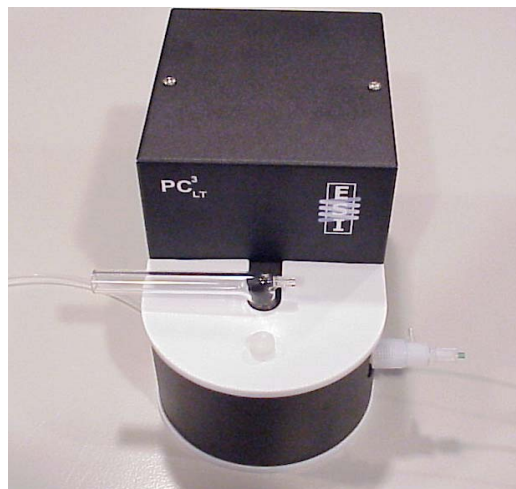


Figure 10. Complete PC³_{LT}

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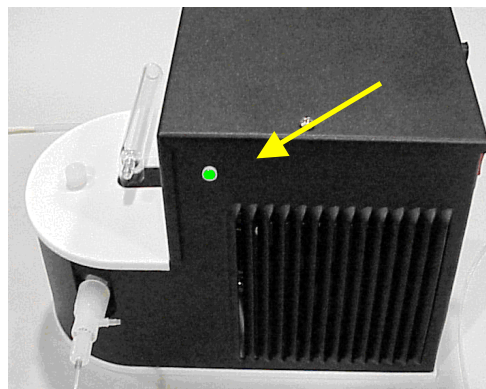
Operation of the PC³_{LT}

The three-way power switch operates the cyclonic spray chamber at factory-set temperatures. When the temperature for each setting is achieved, the green indicator light will illuminate. Power switch functions are detailed below:

The “☉” or up position sets the cyclonic spray chamber for aqueous mode ~2°C.

The “❄️” or down position sets the cyclonic chamber for solvent mode ~-20°C.

The “O” or middle position is the off position





Troubleshooting

Symptom	Possible Cause	Solution
Ice Formation	Check Three-way power switch for correct position	Position Three-way Power switch in the Aqueous position.
Plasma Ignition Problems	Air Leaks in sample introduction system. Drain line is not attached or is clogged.	Inspect all fittings and connections i.e. injector connection and nebulizer fittings Replace or re-attach drain line.
Green Light is not Illuminated	Power system is not on. The cyclonic spray chamber is not to set point temperature. If introducing elevated temperature samples the spray chamber temperature will fluctuate.	Inspect power supply is connected properly. Wait until the temperature stabilizes and green light is illuminated Reduce flow rates by utilizing a low flow nebulizer.
High Oxides	Inspect for air leaks Droplets are too large in the spray chamber resulting in high oxides	Inspect all fittings and connections i.e. injector connection and nebulizer fittings Reduction in droplet size can be achieved with the shielded cyclonic spray chamber or with a low flow nebulizer
High RSD's	Ice formation Spray chamber temperature is not to specified set point Air Leaks in system	Selection switch is in the solvent/organic mode. Wait until green indicator light is illuminated Ensure that all fittings are connected properly

TROUBLESHOOTING

High Backgrounds	<p>System is not draining properly</p> <p>System is contaminated from a previously processed sample</p>	<p>Replace drain line</p> <p>Increase washout time or if system still does not achieve acceptable background levels clean quartz ware with 5% HNO₃ overnight</p>
High condensation on the outside of the Cyclonic Spray chamber	Insulation parts are not inserted properly causing high levels of environmental moisture to react with the spray chamber	Re-assemble the insulation inserts and cover.