# Critical Point Dryers

Polaron

## Polaron E3000 / E3100 / CPD7501 critical point drying systems

- proven reliability
- robust construction
- built in safety features
- choice of 3 models
- sample holder options
- 5 year warranty


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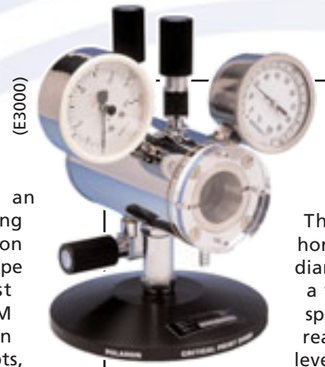
# E3000 / E3100 / CPD7501 Critical Point Dryers

## Critical point drying apparatus

Critical point drying (CPD) is an established method for dehydrating biological tissue prior to examination in the scanning electron microscope (SEM). The technique was first introduced commercially for SEM specimen preparation by Polaron in 1970. The original design concepts, which included a horizontal chamber, are still embodied in the design of the E3000 and E3100 CPD systems. Both units have found general acceptance in many laboratories throughout the world.

A more recent addition is the CPD7501, which features magnetic stirring, built in temperature control and a precise vent control mechanism.

Although primarily an SEM tool, in recent years the CPD method has found novel uses in other applications including the controlled drying of semiconductor materials, MEMs and aerogels.


(E3000)

## E3000 Standard critical point dryer

The design of the E3000 features a horizontal pressure chamber 31.1mm internal diameter x 82mm in length. The chamber has a water jacket for temperature control and specimens are introduced via a removable rear door. For easy viewing of the liquid level, the chamber front is fitted with a 25mm thick glass window and clear plastic guard.

Dial gauges display pressure in the chamber and the temperature of water circulating through the jacket. Three pressure valves permit easy connection to the liquid $CO_2$ cylinder, liquid agitation and venting of the chamber.


(E3000-01)

The transfer boat permits samples in the intermediate fluid to be transferred to the CPD. On sealing the chamber, intermediate fluid begins to drain and can be replaced with liquid $CO_2$. In this way samples are never allowed to dry out during processing. Safety is of course an important consideration with all pressure vessels. Should critical pressure and temperature be inadvertently exceeded, a rupture disc (1850psi) is incorporated in the chamber support. The chamber itself is tested to 2500 psi, which is approximately twice the working pressure. A guard is also fitted over the window.


(E3100)

## E3100 Large chamber critical point dryer

Where increased chamber volume is required the larger capacity model E3100 is recommended. The chamber dimensions are 63.5mm internal diameter x 82mm in length giving approximately three times the volume of the E3000.

The standard E3100-01 transfer boat has nine specimen baskets. Once specimens are in place, the gauze lid can be moved across closing the specimen loading holes.

## CPD7501 Critical point dryer

The CPD 7501 Critical Point Dryer combines versatility and ease of operation. The vertical pressure chamber (30mm diameter x 37mm high) is slightly inclined for efficient solvent drain-off. The size of the chamber is optimised for minimum $CO_2$ usage and good drying capacity. The top cap of the unit has a glass window allowing fluid level to be observed. Heating and cooling is achieved by a built-in thermoelectric device. Cold water is required to cool the Peltier device. Mains (tap) water or a recirculating water heater/chiller (E4860) can be used.

The CPD7501 is fitted with three valves; fluid inlet, flushing and a gas venting system, which uses a fine needle valve in series with a graduated flow valve. The gas venting system ensures a controlled, timed vent - essential for optimum sample preservation.


(CPD798 with transfer tool)

Every CPD7501 is pressure tested at an independent laboratory and carries an appropriate certificate. To ensure safety a bursting disc is fitted.

The CPD7501 is supplied as standard with a four-element stacking sample holder (CPD798). Transfer tool included.

## CPD7501 Options and accessories

The optional CPD810 eight-element stacking holder and CPD799 chamber extension will increase the capacity of the CPD7501 from four to eight specimen baskets.

# E3000 / E3100 Options and accessories

## Thermocirculator (E3500)

The temperature of the E3000 and E3100 chamber can be raised with a mains hot water supply. A more elegant method involves the use of the E3500 water thermocirculator, which is connected directly to the inlet and outlet of the water jacket. The temperature of the circulatory fluid can be pre-set (e.g. to 37°C, just above the critical temperature).


Thermocirculator (E3500)

## Heater/chiller (E4860)

A further alternative is the E4860 recirculating water chiller/heater, which can be used both to pre-cool and heat the CPD chamber. The E4860 has an operating range of -10 to +60°C and incorporates over and under temperature cut-outs.

*Note: for further information see separate E3500/E4800 series brochures.*


Heater/chiller (E4860)

## Holder for coverslips


(E3100-02)

For the E3100 the E3100-02 is a specially adapted specimen holder for processing cells on glass coverslips and will accommodate up to twenty-one coverslips (13mm diameter). Similarly for use with E3000, the E3000-02 accommodates up to seven 13mm diameter coverslips.

## Holder for TEM grids


(E3000-1)

The E3000-01 is designed to hold three 3.05mm TEM grids and can be used with both E3000 and E3100 critical point dryers.

## Porous pots (CPD800)


(CPD800)

Small and delicate samples can be processed in CPD800 porous pots (lids included).



5 year Warranty
see back for details

# E3000 / E3100 / CPD7501 Critical Point Dryers

## Ordering Information

### CPD7501

| CPD7501 Critical point dryer | Code |
|---|---|
| Critical point dryer 220 - 240V | CPD7501 |
| Critical point dryer 110 - 120V | CPD7501/110V |
| With vertical chamber 30mm diameter x 37mm height, glass viewing port and safety shield. Magnetic stirrer is located under the base of the chamber. Controllable thermo-electric Peltier cooling* and heating with digital read out and pressure gauge. $CO_2$ inlet valve, flushing valve and venting system consisting of: exhaust stop valve, fine vent valve in series with a graduated flow meter, high-pressure coupling hose, water hose (2m) and fibre washer. | N/A |
| | |
| **CPD7501 Dimensions and weight:** | |
| 340 x 130 x 250mm, 9Kg (unpacked) | N/A |
| 360 x 410 x 380mm, 12Kg (packed) | N/A |
| | |
| **CPD7501 Supplied with:** | |
| 4-element stacking specimen holder, each element 25mm diameter x 5mm high, loading/extracting tool. | CPD798 |
| | |
| **CPD7501 Operation:** | |
| Comprehensive operating instructions | N/A |
| Pressure test certificate | N/A |
| | |
| **CPD7501 Options and accessories:** | |
| Spare 4-element stacking holder** | CPD798 |
| Chamber extension - adding 37mm to existing dimensions, 30mm diameter x 70mm high (volume 50ml) | CPD799 |
| 8-element stacking specimen holder - for use with CPD799 chamber extension | CPD810 |
| Porous specimen pots with lids 12.7 X 15.7mm (pkt 10) | CPD800 |
| Porous specimen pots with lids 25.4 X 25.4mm (pkt 10) | CPD801 |
| Spare safety bursting disc (pre-set approx 1850psi) | E3000-052 |

*Note: to maintain cooling and heating efficiency, cooling water is needed to dissipate heat generated by the Peltier module.
**Note: two CPD798 cannot be used with CPD799.

**Warranty**

All Polaron Range products have a comprehensive 12 months warranty as standard. The warranty on the E3000,E3100 and CPD7501 and it's options may be extended to FIVE years at no cost simply by completing and returning a registration form. In the unlikely event of a defect arising as a result of material failure in normal usage our extended warranty requires the return of the equipment to our factory for repair. This extended warranty does not cover consumables or E3500 and E4800 series which are covered by the original manufacturers warranty only.

Free telephone and email technical support is available for the life of the product by contacting customer support on tel +44 (0)1273 510535, fax +44 (0)1273 510536 or email: support@quorumtech.com.

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### E3000 & E3100

| E3000 Standard critical point dryer | Code |
|---|---|
| With horizontal specimen chamber 30.5mm internal diameter x 82mm long with integral water jacket, removable rear door, front viewing window, temperature and pressure gauges and safety over-pressure rupture disc. | E3000 |
| | |
| **E3100 Large chamber critical point dryer** | **Code** |
| With horizontal specimen chamber 63.5mm internal diameter x 82mm long with integral water jacket, removable rear door, front viewing window, temperature and pressure gauges and safety over-pressure rupture disc. | E3100 |
| | |
| **E3000 & E3100 Dimensions and weight:** | |
| 230 x 230 (minimum bench space required) | N/A |
| 380 x 320 x 410mm, 20Kg (packed) | N/A |
| | |
| **E3000 & E3100 Supplied with:** | |
| 1m liquid carbon dioxide delivery tube with connector, water hoses, O-ring set (including window and door bonded seals), spare bursting disc and retaining copper washer, steel bar for tightening/untightening the chamber door, flat wrench (for removing the window retaining ring) | N/A |
| | |
| **E3000 & E3100 Operation:** | |
| Comprehensive operating instructions | N/A |
| Pressure test certificate | N/A |
| | |
| **Options and accessories:** | |
| **E3000:** (E3000-01 included as standard) | |
| Specimen holder for 3.05mm grids | E3000-1 |
| Specimen holder for 2.3mm grids | E3000-2 |
| Specimen holder for tissue (boat) | E3000-01 |
| Specimen holder for coverslips | E3000-02 |
| | |
| **E3100:** (E3100-01 included as standard) | |
| Specimen holder for 3.05mm grids | E3100-1 |
| Specimen holder for 2.3mm grids | E3100-2 |
| Specimen holder for tissue (boat) | E3100-01 |
| Specimen holder for coverslips | E3100-02 |
| | |
| **E3000 & E3100:** | |
| Porous specimen pots with lids 12.7 X 15.7mm (pkt 10) | CPD800 |
| Porous specimen pots with lids 25.4 X 25.4mm (pkt 10) | CPD801 |
| Thermocirculator for control of heating cycle* | E3500 |
| Heater/Chiller for control of heating and cooling cycles 0.2 HP (400 W) extraction rate at 20°C * | E4860 |

*Note: please specify required voltage for the Thermocirculator or Heater/Chiller

**www.quorumtech.com**

Manufactured in England by

Quorum Technologies

15a Euro Business Park, New Road, Newhaven, East Sussex, BN9 0DQ
Tel: +44 (0)1273 510535 Fax: +44 (0)1273 510536
email: sales@quorumtech.com www.quorumtech.com

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