



TA Instruments PCA for DSC Operation

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The PCA is a compact, easy-to-use photocalorimeter accessory for the TA Instruments Q Series DSC modules with Tzero™ Technology (T4 and T4P signals). It readily permits characterization of materials that respond to exposure to UV / Visible light. When the samples react to the light, the evolved heat is measured and used to study the relative reactivity and / or kinetics of reaction. Figure 1 shows the PCA module.



System Description

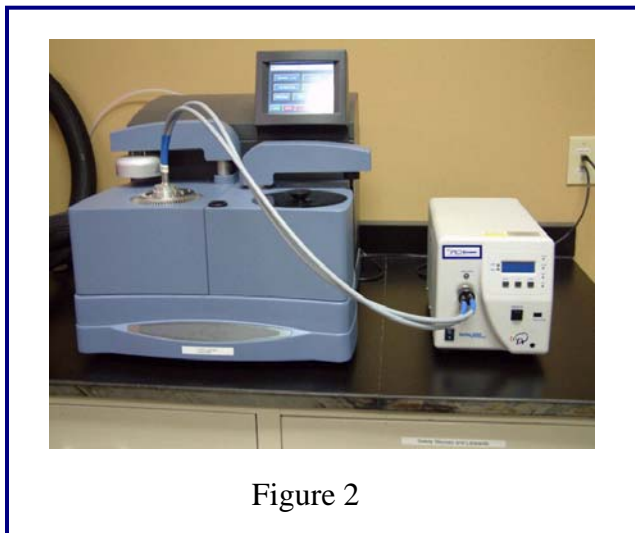


Figure 2

A typical DSC / PCA system is shown in Figure 2. The TA Instruments PCA is based on a filter photometer design, in which radiation (250-600 nm) from a high pressure mercury source passes through broadband filter (320-500 nm is standard) and then is transmitted to the DSC cell via a one-meter long, 3-mm diameter, dual extended range (250-700 nm), quartz light guide, which attaches to the cell using a special adapter. The system permits characterization of photocuring materials from ambient to 250 °C and

from -50 and 250 °C when the RCS cooling accessory is present. Tzero™ technology permits direct measurement of light intensity and also provides for simultaneous measurement of two samples.

Another version of this PCA is available for use with the ARES rheometer for photocuring studies. Contact TA Instruments for details.

New features of the PCA include a 200 W lamp that records the number of hours of use. Closed-loop feedback technology continuously monitors the light and automatically

makes adjustments to ensure the required output level is maintained for every cure reaction in a sequence of experiments. The broad spectral lamp output (250-600nm) and filter availability makes the PCA ideal for a wide range of applications. An optional radiometer is available for situations where it is desired to calibrate the filter photometer itself. Because of the special Tzero Technology features, which allow for direct measurement of intensity at the sample and reference positions, the use of the radiometer is typically not necessary in most DSC / PCA experiments. The dual quartz light guides, if properly used, offer extended operational lifetime as well as the widest range of operational temperature (-50 to 250 °C).

A summary of the features and user benefits of the PCA is supplied below.

<u>Features</u>	<u>Benefits</u>
200W lamp with 25W/cm ² output	Broad range of applications
Closed loop feedback technology	Maintains a constant output for repeatable curing processes
Selectable filters (bandpass / cut-off) filters	Customize wavelength to application
Dual Quartz light guides	Wide temperature range; extended lifetime
Low noise fan	Quiet operation in workplace
Electrical certification	Ready for worldwide use
CE marked; certified to IEC, Canadian and US standards	

PCA Specifications

Lamp	High Pressure 200 W Mercury Vapor
Filters - bandpass	320 – 500 nm (standard) 250-450 nm (optional)
Filters – cutoff	390 nm (optional) 490 nm (optional)
Panel Controls	Power On / Off; Mode; Adjust Up/Down; Start / Stop; Lock / Unlock
Electrical Power	100-120 VAC / 200-240 VAC; 50 / 60 Hz
Dimensions	34 cm (D)*18cm(W)*20 cm (H)
Weight	4.5 kg (9.9 lbs)
Warranty (ex lamp/light guide)	One year

Note: Spent Hg lamps must be managed in accordance with Disposal Laws.

Keywords

DSC, PCA, Photocalorimeter, Filter Photometer, Cure

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