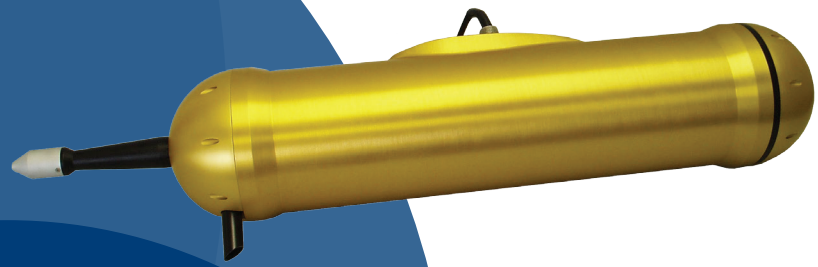
PCASP-100X

AIRBORNE PASSIVE CAVITY AEROSOL SPECTROMETER PROBE



DROPLET MEASUREMENT TECHNOLOGIES

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OVERVIEW

The PCASP-100X is an airborne optical spectrometer that measures particles in the 0.10 - 3.0 µm diameter range. This instrument is currently in use on research aircraft in more than 20 countries.

The PCASP-100X was originally designed and manufactured by Particle Measuring Systems of Boulder, Colorado, but is now offered exclusively by DMT. Updated electronics have enhanced the probe's sizing resolution and data system interface.

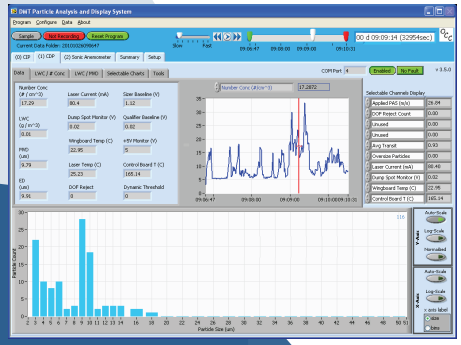
APPLICATIONS

» Aerosol research
» Air quality and visibility
» Atmosphere and climate
» Weather modification
» Biomass burning studies

ADVANTAGES

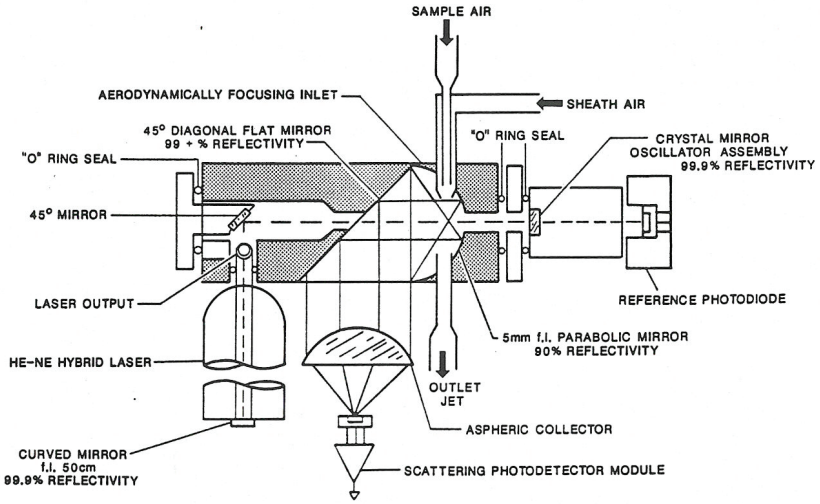
» Elimination of dead-time losses
» Size distributions accumulated in the probe, with serial transmission to any standard computer communications port; this eliminates the need for special data systems or interfaces
» User-programmable sample rates, number of channels, and channel size thresholds
» Monitoring of multiple housekeeping variables

SOFTWARE



The Particle Analysis and Display System (PADS, shown at left) is optional software that provides a user-friendly virtual instrument panel. PADS allows the user to control the PCASP-100X and display real-time data and logs. For instance, the program enables the user to do the following tasks:

» Sample and record data
» View particle volume and number concentrations, as well as Median Volume Diameter (MVD) and Effective Diameter (ED)
» Monitor instrument parameters like laser reference voltage and other instrument-health indicators
» Play back data for post-flight viewing
» Reprocess data with new parameters for additional analysis



PCASP-100X Optical System

HOW IT WORKS

The PCASP-100X consists of an optical bench and signal processing electronics. The optical bench collects light that is scattered by individual particles passing through a laser beam. It then converts the photon pulses to an electron voltage pulse via an Avalanche Photo Detector. The electronics package amplifies, filters, digitizes and categorizes this voltage pulse before transmitting the digital value for processing by an external data system.

The scattered light intensity of the PCASP-100X's particle sizing range covers more than six orders of magnitude. As a result, the instrument uses an amplification system with three gain stages. The high-gain stage amplifies the signal detector voltage by a factor of 45 greater than the mid-gain stage, and the mid-gain stage amplifies by a factor of 17 greater than the low-gain stage. This system allows the probe to accurately size all particles in its range.

INCLUDED ITEMS

» Spectrometer
» Operator manual
» Power and serial cables
» Shipping case
» One day of training at DMT's facility
» Email and phone technical support
» One-year warranty

ACCESSORIES

» PADS Software
» Data Acquisition System
» Aerosol Generator

HOW TO ORDER

Contact DMT for pricing or more information:
+1.303.440.5576,
customer-contact@dropletmeasurement.com.

PCASP-100X SPECIFICATIONS

Measured Parameters	» Particle size (determined from particle light-scattering) » Ambient temperature » Standard and volumetric flows for sample and sheath air
Derived Parameters	» Particle Concentration » Median Volume Diameter (MVD) » Effective Diameter (ED)
Particle Size Range	0.1 – 3.0 µm
Maximum Count Rate	3,000 particles/sec
Counting Efficiency	50% at minimum threshold, increasing to 100% by the fourth size channel
Sampling Frequency	0.1 to 25 Hz, selectable
Flow Rate	» Sample flow: 1 cc/sec » Sheath flow: 15 cc/sec
Air Speed Range	0 - 250 m/sec
Number of Size Bins	Standard is 30
Laser	HeNe multi-mode classical passive cavity, wavelength 0.6328 µm
Light Collection Angle	Nominally 35° - 120°
Data System Interface	RS-232 or RS-422, 34800 baud rate
Calibration	PSL aerosol generator
Power requirements	» Probe: 115VAC or 230VAC, 50-60Hz, less than 120W; specify voltage when ordering » Anti-ice: 28 VDC, 215 W
Weight	40 lbs (18.2 kg)
Dimensions	» 40” long x 7” diameter (102 cm long x 18 cm diameter)
Operating Conditions	» Temperature: -30 to +40 °C » Altitude: 0 to 30,000 ft (9.1 km) » Relative Humidity: 0 - 90% RH (non-condensing)

Rev A

August 28, 2013

DROPLET MEASUREMENT TECHNOLOGIES

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