

12000 Ambient Air Monitor

Condensation Particle Counter & Optical Particle Counter



The Particles Plus 12000 is the first real-time dual mode ambient monitor to feature both a condensation particle counter and an optical particle counter in an integrated unit. The 12000 condensation particle counter is designed to detect and count aerosol particles by first enlarging the particulates using a supersaturated vapor. These robust monitors provide reliable, accurate measurement of airborne particles across a very wide size range (from fines to ultrafines) allowing for the detection of environmental and public health concerns involving airborne particulates.

Real-Time Data

The optical particle counter (OPC) bins fine particulates in up to 6 particle size channels (from 0.3 μm to 25 μm) which are stored in on-board memory at a user-defined data sampling rate (1 second to 99 hours per sample). The condensation particle counter (CPC) measures ultrafine particulates as small as 5 nm (0.005 μm) and provides a total particle count above this threshold, this data is also stored in each of the above samples to provide a more complete view of air quality.

Internet-Enabled

Particles Plus systems are configured to allow users to push real-time data to the cloud where sensor outputs can be visualized by authorized stakeholders.

Fully Integrated Environmental Sensor System

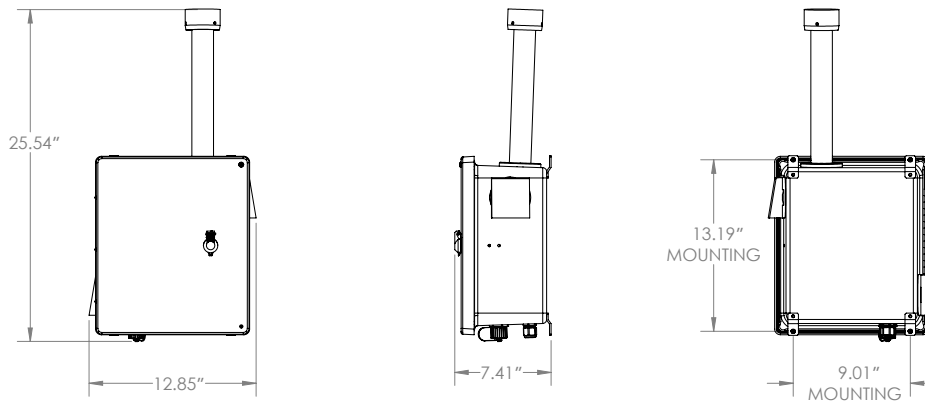
Integration of additional sensors for measurement of environmental and meteorological parameters including relative humidity, temperature, barometric pressure.

Applications

- Airborne Pollution and Environmental Research
- Perimeter or Fence-line Monitoring for Construction, Remediation or Waste Sites
- Mine and Quarry Fence-line Monitoring for dust control operations
- City Wide or Community Air Pollution Monitoring
- Roadside Emissions Monitoring
- Medical Facilities Property Monitoring
- Power Line Wild-Fire Monitoring
- Environmental Disasters

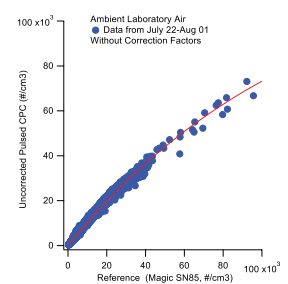
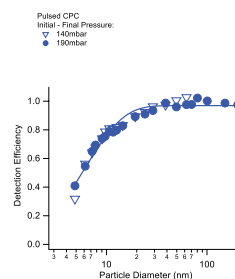
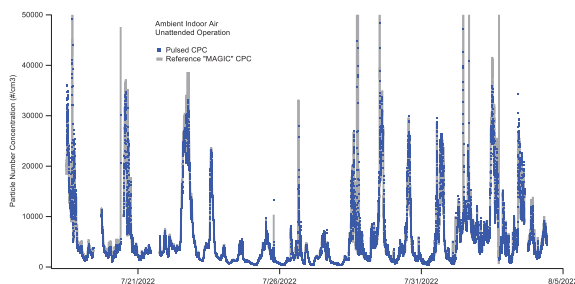
Features and Benefits

- User-selectable PM sizes from 0.3 to 25 μm (from the OPC)
- Total particulate counts above the ultrafine threshold (0.005 μm , from the CPC)
- Closed-loop humidity control for the OPC airstream
- Closed-loop condensation control within the enclosure
- CPC Aerosol Concentration Range of 0 to 100,000 particles per cubic centimeter
- ULTRAGUARD® Fiberglass reinforced polyester NEMA 4 rated outdoor tamper-proof enclosure with internal thermal control
- 4.3" (10.9 cm) WQVGA (480x272) color touch screen
- Optional Cloud based data management software subscription available for remote monitoring
- Monitor for 24 hours a day, 7 days a week, 365 days a year



Specifications

| Model 12000 | Optical Particle Counter | Condensation Particle Counter |
|------------------------|--|--|
| Measured Parameter | Fine particle counts, concentration and mass | Ultrafine particle concentration |
| Operating Principle | Optical light scattering | Optical light scattering after water vapor growth |
| Condensation Approach | None | Near-adiabatic expansion with single particle counting |
| Concentration Range | 0.01 to 20,000 $\mu\text{g}/\text{m}^3$ (50,000,000 particles/ ft^3) | 0 to 100,000 particles/ cm^3 |
| Particle Size Range | 0.3 to 25 μm | 0.005 to 3.0 μm |
| Size Channels | Factory calibrated at 0.3, 0.5, 1.0, 2.5, 5.0, 10.0 μm variable binning | 0.005 μm threshold (one size bin) |
| Efficiency | 50% @ 0.3 μm ; 100% for particles >0.45 μm per JIS | $\pm 10\%$ below 30,000/ cm^3 , $\pm 20\%$ at higher concentrations |
| Sample Rate | Minimum 1 second with no hold time, maximum 99 hours | 6s cycle time |
| Number of Channels | Up to 6 channels | 1 |
| Liquid Requirement | None | Distilled water |
| Flow Rate | 1.2 LPM | Variable |
| Internal Vacuum Pump | Internal pump with closed-loop control | Internal pump with local control |
| Operating Conditions | -4° to 122°F (-20° to 50°C) / 20% to 95% non-condensing | 45° to 100°F (5 to 38°C) |
| Display | 4.3" (10.9 cm) WQVGA (480x272) color touch screen | |
| Custom Size Channels | Calibration for custom size channels available | |
| Communication Modes | Ethernet, USB. (Optional) Wireless 802.11 b/g, RS485, RS232 or LoRaWAN | |
| Environmental Sensor | Temperature -4° to 122°F (-20° to 50°C) $\pm 1^\circ\text{F}$ (0.5°C) Relative Humidity 0 -100% $\pm 2\%\text{RH}$ | |
| Alarm | Alarms for all particle values, environmental sensors, flow and sensor failure | |
| Instrument Calibration | Particle sensor recommended once per year | |
| User Calibration | Field calibration of temperature and humidity possible with included utility software | |
| External Surface | ULTRAGUARD® Fiberglass reinforced polyester - compression molded SMC box and Cover | |
| Dimensions (L x W x H) | 12.85" x 7.41" x 25.54" (32.7 cm x 18.9 cm x 64.9 cm) includes barb fittings | |
| Weight | 15.1 lbs. (6.84 kg) | |
| Accessories | Quick start guide, operating manual on USB flash drive, mounting feet | |
| Optional Accessories | Printed manual, data cable, pole mounting hardware kit | |
| Data Storage | Internal 45,000 sample records (rotating buffer) including particle count data and environmental data | |
| Power | 110 to 240 VAC 50/60 Hz universal in-line power supply | |
| Warranty | 2 year limited warranty. Extended warranties available | |



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