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2B Buzz

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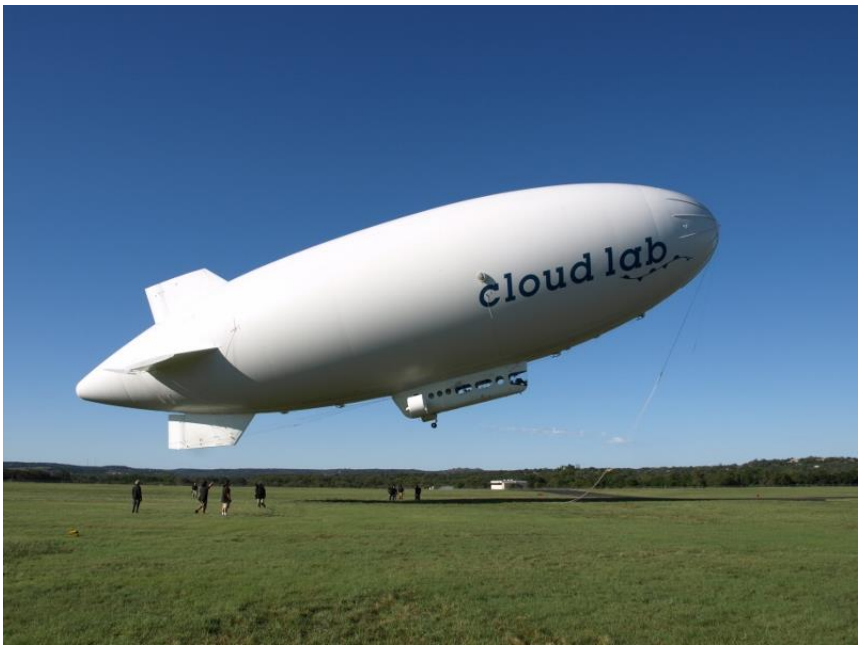
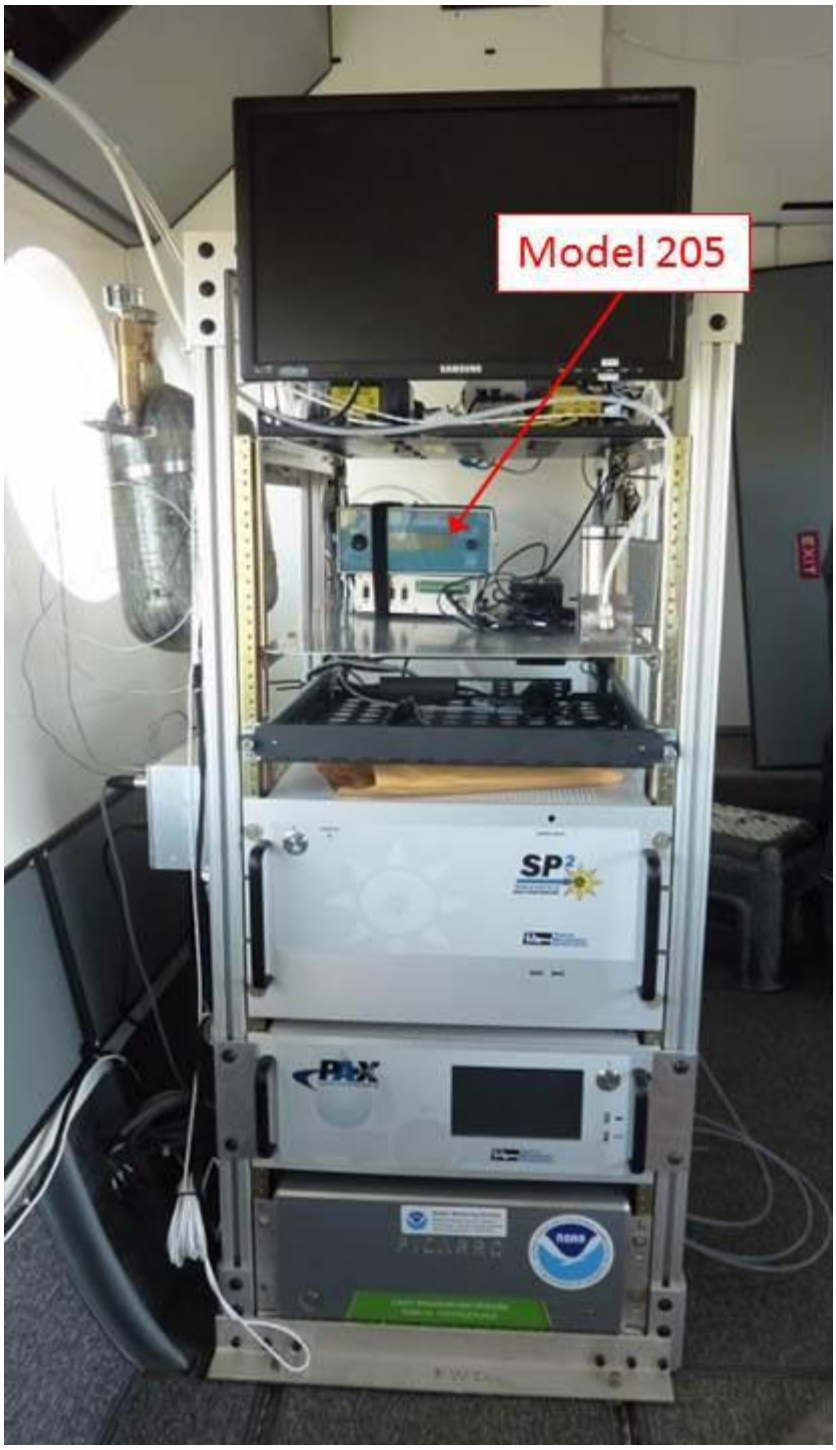
Case Study: Cloud Lab



World's Largest Airship Probes the Secrets of the Skies

The world's largest blimp, dubbed 'Cloud Lab', set off on a month long journey across the US to take a closer look at cloud chemistry. It traveled westward from a humid Florida coast, followed in the footsteps of Hurricane Katrina, and buoyed above the Pacific. The "skyship" was outfitted with a pair of 260 horsepower Porsche engines and packed with an array of instruments to study not only the formation of clouds and microbes within clouds, but also to monitor insect migration, bat sounds via microphones dangling from cables, transportation of trace atmospheric gases, and the genesis of wildfires to name only a few. What's more, this famous flying laboratory is equipped with one of 2B Technologies' own Model 205 Ozone Monitors, the fasted UV-based ozone monitor on the market.



2B Technologies Model 205 Ozone Monitor amidst an assortment of scientific instruments aboard the Cloud Lab

Dr. Jim McQauid and Dr. Kelly Baustian, featured scientists aboard the Cloud Lab, have partnered with BBC to make a television program highlighting the excursion. Cloud Lab series producer James Van Der Pool, explains: "The 100 kilometres or so of air above our heads is all that separates us from space. It's in every breath we take and makes Earth habitable. Yet for all its centrality to the health of the planet there's a lot we still don't know about the atmosphere. For instance, at what altitude does life cease? What type of air is most likely to cause rain? With Cloud Lab we've a rare and exciting opportunity to address some of these questions head on." (BBC Media Centre)

Dr. McQuaid, who recognized the excursion as a unique opportunity to observe the atmosphere from coast to coast, says

"having the film crew on board brings an added dimension of complexity". Cloud Lab will be featured on BBC sometime in the next year, but for now we encourage you to check out highlights of the expedition in the words and photographs of Dr. McQuaid himself, at http://jimmcquaid.wordpress.com/.

Monitoring Tip: Using an Inlet Filter

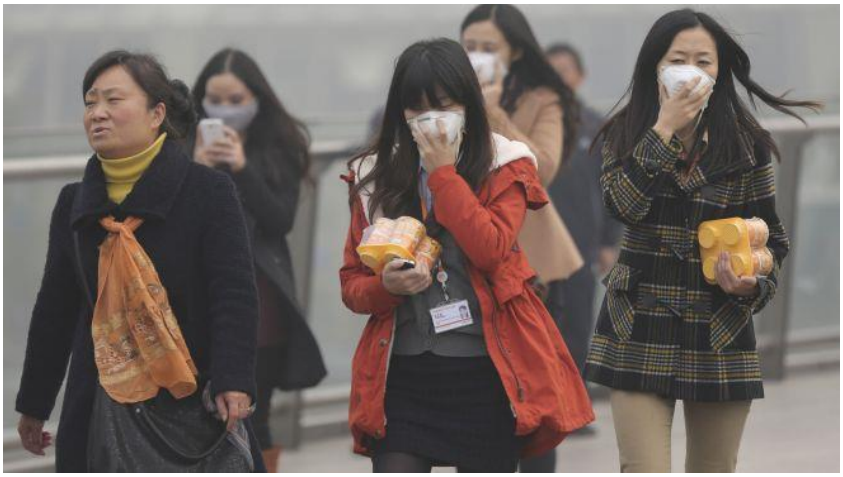
Your Ozone Monitor's sample flow path can become contaminated by particulates after continuous use. This is especially true when the monitor is used in outdoor applications. The contamination can both react with ozone and cause a low photodiode voltage by reducing transmission through the detection cell that will eventually lead to unreliable ozone measurements.

2B Technologies therefore recommends the use of a particle filter at the inlet of your ozone monitor. We provide a filter housing and package of ten Teflon particle filters for $150. This assembly is provided with tubing/connector and is easily attached to the instrument's inlet port with the provided hardware.

Air Pollution News: China's Air Pollution Reaches Record Levels

Air pollution in China has reached unprecedented levels, at times being more than ten times the level considered safe by the World Health Organization. This has prompted government warnings, school cancellations, and a thick blanket of smog shrouding Shanghai's famous skyline. The Air Quality Index (AQI), a generalized method of describing air quality based on five atmospheric pollutants, advises the public to stay indoors when above a level of 150. Last month, Shanghai consistently reported AQI levels over 300. In Zaozhuang the index hit 500, the absolute maximum on the scale. This frightening reading has been witnessed across China, such as to the northeast in Harbin which experienced an "airpocalypse" so devastating that the city's blog reported "you can't see your own fingers in front of you".

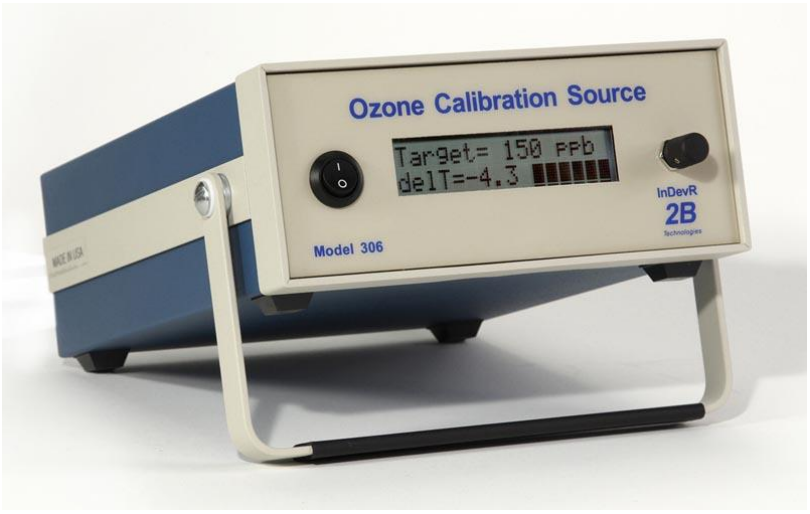
Shanghai's famous skyline shrouded in haze last month.
(From China Foto Press on 12/5/13)



Workers wear masks to protect them from air pollution in Shanghai, China. Shanghai authorities ordered schoolchildren indoors and halted all construction as China's financial hub suffered one of it's worst bouts of air pollution.
(From Fox News 12/6/13)

The dirty air that grips these provinces is attributed to coal burning, car exhaust, excessive industrial emissions, severe weather, lack of wind and low-hanging air masses, serving as a harsh reminder to all of us of the importance of regulating air pollutants.

Featured Product: Model 306 Ozone Calibration Source



The 2B Technologies model 306 Ozone Calibration Source is a portable source of ozone that allows you to calibrate any ozone monitor - not just those manufactured by 2B Tech. This instrument scrubs ozone from ambient air and produces any ratio of ozone from 30 to 1,000ppb at a flow rate of 3 L/min. It features an easy to use menu and the same small, rugged and highly portable instrument case as the Model 202 and Model 205 Ozone Monitors.

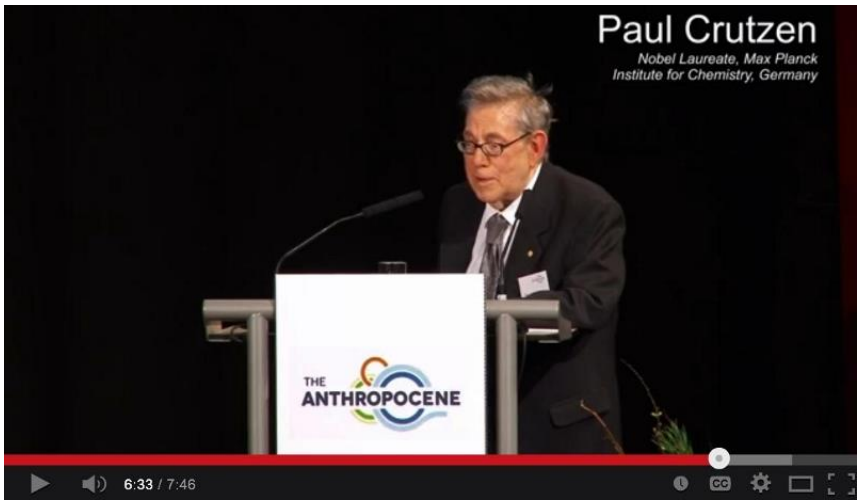
Some applications of the Model 306 include:

- Calibration of ozone monitors in the field
- Testing of materials such as rubber, plastics and paint for

effects of ozone exposure
- Studies of the effect of ozone on plants

For more detailed information on the instrument, including example data and specifications, see Model 306.

Symposium on the Anthropocene: Celebration of Paul Crutzen's 80th Birthday



Symposium video: Click on image above to see the video on Youtube.

Dr. Paul Crutzen's 80th birthday was celebrated by a special symposium on "The Anthropocene" on December 2, 2013. The symposium, attended by ~500 friends and scientists from around the world, was held in a castle, the Kurfürstlichen Schoss, in Mainz, Germany. Paul Crutzen shared the Nobel Prize for Chemistry with F. Sherwood (Sherry) Rowland and Mario Molina in 1995 for his many contributions to atmospheric chemistry, but especially for his work on the chemistry of the stratosphere. In 1970, Paul was the first to recognize that N_2O produced by soil and sea bacteria reaches the stratosphere where it reacts to form NO, which destroys ozone via the now famous catalytic cycle that he was the first to describe. Soon after, he and Harold Johnston independently postulated that a proposed fleet of supersonic aircraft could harm the ozone layer.

The discovery that small quantities (a few megatons) of a chemical species could cause stratospheric ozone depletion led in 1974 to the postulate by Rowland and Molina that CFCs, being unreactive in the lower atmosphere, would eventually reach the stratosphere where they would release chlorine atoms and catalyze ozone depletion in a cycle analogous to the NO_x cycle discovered by Paul. The Antarctic "ozone hole" was later discovered and proven to be caused by CFCs, albeit by a different set of catalytic reactions. Paul Crutzen made a major contribution to our understanding of the ozone hole as well.

The theme of the conference, "The Anthropocene", is a term

coined by ecologist Eugene Stoermer and Paul Crutzen in 2000 as a new geological epoch to represent the current period in which human activities are altering the Earth's biochemical cycles via changes in land and water use, atmospheric composition, and climate, resulting in the extinction of species (see: The Anthropocene). Distinguished scientists who have worked closely with Paul over the years summarized his many fundamental contributions to our understanding of human impacts on the atmosphere and climate, including ozone depletion by NO_x, the Antarctic ozone hole caused by CFCs, tropospheric ozone production, atmospheric effects of deforestation and biomass burning, the "nuclear winter" that would result from a nuclear war, N_2O emissions resulting from use of nitrogen fertilizers for biofuel production, and the evaluation of possible geoengineering approaches to reduce global warming.

"I have grandchildren, and I would like these grandchildren to live in an environment which is far better than it is at the moment."

- Paul Crutzen