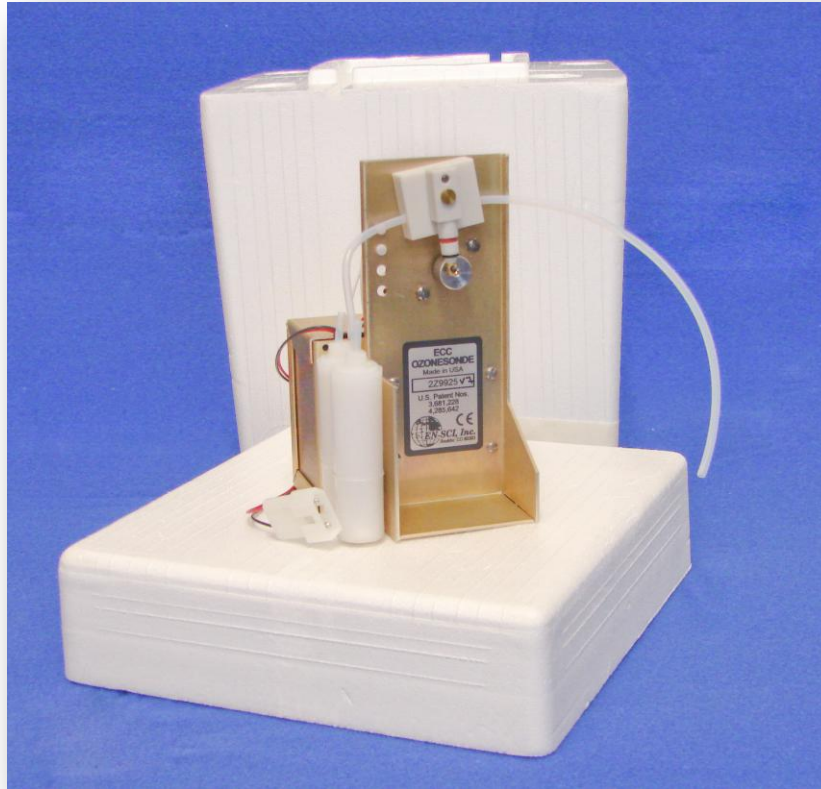


Electrochemical Concentration Cell (ECC) Ozonesonde



The DMT/EN-SCI ECC ozonesonde is a lightweight, compact, and inexpensive balloon-borne instrument for measuring atmospheric ozone. Developed by Dr. Walter Komhyr and sold for decades by EN-SCI Corporation, it is now manufactured exclusively by DMT.

Advantages

- Accurate, precise, high-resolution ozone measurements
- Unique design that allows pump operation without ozone-destroying lubricants
- Easily coupled with the most popular radiosonde models for parameters such as GPS coordinates, pressure/altitude, temperature, and relative humidity
- Portable and economical data system (optional)



2545 Central Avenue
Boulder, Colorado, USA 80301
www.dropletmeasurement.com
ph: 303-440-5576, fax: 303-440-1965

Applications

- Atmospheric research
- Climate-change studies

Principle of Operation

Unlike some ozonesondes, ECC sondes do not require an external electrical potential. The ECC gets its driving electromotive force from the difference in the concentration of the potassium iodide solutions in the instrument's cathode and anode chambers. When ozone enters the sensor, iodine is formed in the cathode half cell. The cell then converts the iodine to iodide, a process during which electrons flow in the cell's external circuit. By measuring the electron flow (i.e., the cell current) and the rate at which ozone enters the cell per unit time, ozone concentrations can be calculated.



Photo: ECC Ozonesonde being launched in Fairbanks, Alaska. Photo courtesy of NOAA/ESRL Global Monitoring Division.

Specifications

Information about the accuracy, precision and resolution of the DMT/EN-SCI ECC Ozonesonde appears below.

<i>Pressure Altitude (hPa)</i>	<i>Accuracy (%)</i>	<i>Precision (%)</i>	<i>Resolution* (km)</i>
1000	±5	±4	0.3
200	± 12	±12	0.3
100	±5	±3	0.3
10	±5	±3	0.4
4	± 10	±10	0.4

* Corresponding to approximately a 90% step change in ozone in one minute.



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Technique	Electrochemical process that generates electrical current in proportion to ozone concentrations
Measured Parameters	Ozone partial pressure, sonde housekeeping parameters
Operating Pressure	1050-4 hPa
Operating Temperature	0 – 40 °C
Power Requirements	12 – 18 VDC, 120 mA
Weight (including battery)	~0.7 kg*
Instrument Dimensions	7.6 cm x 7.6 cm x 13.3 cm
Flight Box Dimensions	19.1 cm x 19.1 cm x 25.4 cm

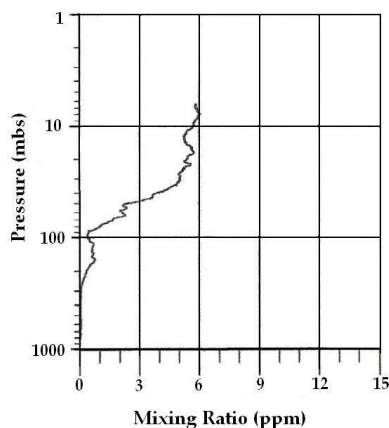
* Weight may vary slightly depending on which radiosonde accompanies the unit.

Data Acquisition System

The Model DAS-2 Data Acquisition and Processing System allows for data acquisition, data processing, and post-processing analysis. The DAS-2 system includes the following components:

- Software
- Modem
- Tripod-mounted 403 MHz Yagi antenna with preamplifier
- 403 MHz receiver
- 15-meter co-axial signal cable

The user supplies the personal computer the DAS-2 system runs on.



Models

The DMT/EN-SCI ECC Ozonesonde is available in several models to accommodate different types of radiosondes or operating environments:

- Model Z: fits Vaisala RS92 digital and analog radiosondes
- Model ZZ-V2D(E): fits older Vaisala radiosondes
- Model ZZ-V7: fits InterMet radiosondes
- Model 4Z: designed for ground use



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