Airel

Tiny Ion Counter

TIC

Model: 203

An instrument for measuring the total concentration of positive and negative cluster ions.

It is designed to provide a reliable and cost-effective long-term cluster ion monitoring solution for both indoor and outdoor environments.

Applications

- Measure the number concentrations of positive and negative cluster ions with mobilities above 0.25 $cm^2/V/s$.
- Monitor the operation of ionization-based air purification systems.
- Measure the spatial distribution of cluster ion concentrations over a large area or at different altitudes using multiple devices.
- Observe cluster ion concentrations on board a UAV.
- Enhance air quality monitoring solutions for a more comprehensive overview of indoor climate and health risks.

Benefits

- Measures both polarities of ions separately in parallel with two analyzers.
- Small and lightweight.
- Well suited for long-term unattended operation thanks to comprehensive internal diagnostics that guarantee reliable measurement results.
- Long maintenance interval. Very simple maintenance procedure.
- Easy to integrated into custom IoT solutions and data acquisition systems. The data communication protocol is thoroughly documented.

Measurement Principle

The TIC uses two independent first-order parallel plate differential mobility analyzers.

Ions pass an electric field and are pushed towards the collecting electrode. The depositing ions produce an electric signal which is measured using high sensitivity integrating electrometers and transformed to ion concentrations.

The sample flow rates of both analyzers can be freely specified in the range from 2 l/min to 9 l/min depending on the requirements of the experiment and the available signal level. The voltages of the repelling electrodes are automatically adjusted to keep the detected ion mobility range constant.

The instrument includes air pressure sensors to compensate for the effect of air pressure change on ion mobility.

Specifications

Name	Tiny Ion Counter
Model	203
Measurement Range	positive and negative cluster ions separately, z > ±0.5 $cm^2/V/s$
Measurement Principle	parallel plate mobility analysis, integrating electrometers
Sample Flow Rate	2 – 9 l/min, 5 l/min typical per polarity, software selectable
Noise Level	TBD, 100 #/cm^3 total concentration at 5 l/min sample flow
Time Resolution	10 seconds typical, up to 1 s depending on signal level
Operating Temperature	–20 to 40 °C
Air Pressure Range	500 to 1200 hPa
Consumables	None
Interface	USB type C connector. Exposed as virtual serial port device. Full communication protocol documentation available.
Software	Graphical and command line measurement and data review software (Microsoft Windows 7 or newer and Linux), Python library (platform independent)
Dimensions	H 5 cm, W 12 cm, L 16 cm
Power Requirement	DC 5 V, 1 A maximum, 0.5 A normal operation. Powered from the main USB data port or second dedicated USB power-only port.
Weight	1.1 kg

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For more information please visit **www.airel.ee**

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