

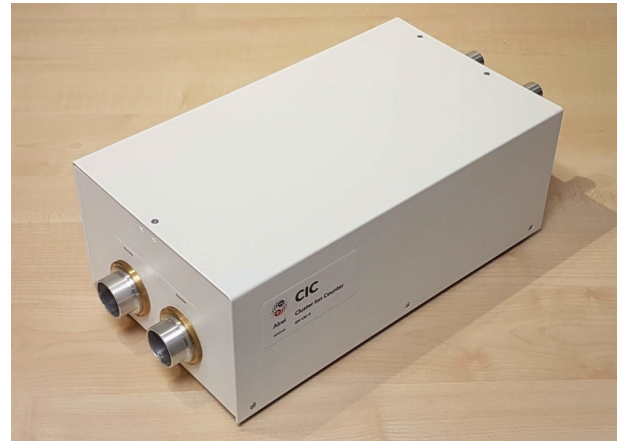
Cluster Ion Counter

CIC

Model: 201

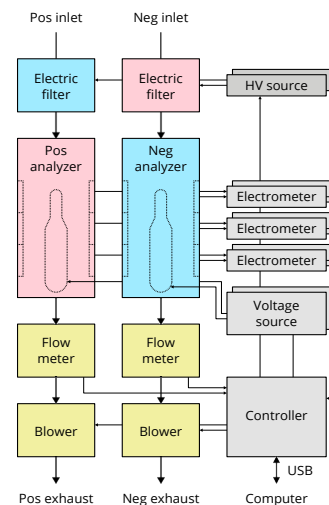
An instrument for measuring the concentration and average mobility of positive and negative cluster ions.

It is designed to provide reliable cluster ion measurements for both long term field monitoring as well as laboratory experiments.



Applications

- Measure total number of cluster ions with mobilities above $0.25 \text{ cm}^2/\text{V/s}$, assess their average mobility.
- Observe rapid processes with a time resolution up to 100 milliseconds during vehicle based measurements or chamber experiments.
- Study temporal development cluster ion concentration (new particle formation events, ion induced nucleation)
- The CIC has minimal inlet losses allowing it to be used as a reference instrument for confirming the results of more advanced ion spectrometers (Neutral cluster and Air Ion Spectrometer NAIS by Airel) or mass spectrometers.
- Detect cluster ions at high altitudes or chamber experiments. The CIC can operate in a wide atmospheric pressure range from 300 to 1200 hPa.



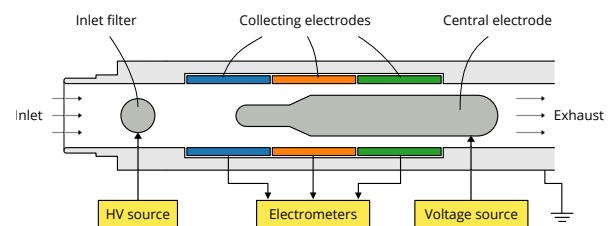
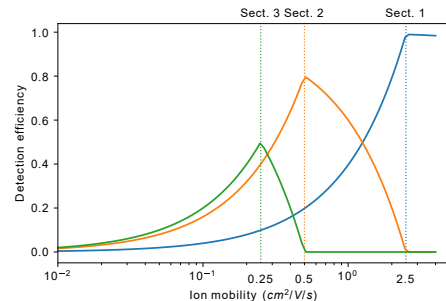
Measurement Principle

The CIC uses two independent first order cylindrical differential mobility analyzers with three collecting electrodes each. This allows the instrument to measure the total concentration of cluster ions with a well defined cut-off mobility and to additionally assess the average mobility of the ions measured.

The electric signals from the collecting electrodes are measured using high sensitivity integrating electrometers at a rate of 30 measurements per second. The inlet of the instrument is designed to keep the ion losses at a minimum. The short inlet and high measurement rate allow the instrument to achieve very high time resolution – up to 100 ms.

The sample flow rates of both analyzers can be freely specified in the range from 10 l/min to 60 l/min depending on the requirements of the experiment and available signal level. The central electrode voltages 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.



The CIC transfer functions and mobility analyzer.

Specifications

Name	Cluster Ion Counter
Model	201
Measurement Range	positive and negative cluster ions, $z > \pm 0.5 \text{ cm}^2/\text{Vs}$
Sample Flow Rate	10 – 60 l/min per polarity, software selectable
Noise Level	20 #/cm ³ total conc. at 40 l/min sample flow
Time Resolution	1 second typical, up to 100 ms depending on signal level
Operating Temperature	-20 to 40 °C
Sample Air Pressure Range	300 to 1200 hPa
Consumables	None
Power Requirement	DC 15 V, 0.5 A
Interface	USB
Software	Spectops software for data acquisition and on-line processing, Retrospect software for data review and reprocessing Supports Microsoft Windows 7 or newer and Linux
Dimensions	H 12 cm, W 20 cm, L 38 cm
Weight	5 kg

For more information please visit www.arel.ee