

miniRUEDI Datasheet

The miniRUEDI is a unique portable mass-spectrometer system for quantification of the partial pressures of He, Ar, Kr, N₂, O₂, CO₂, CH₄, H₂, etc. in gaseous or aqueous matrices. The instrument is designed for environmental research and is suitable for maintenance-free on-site operation during field work at remote locations. The gases are continuously sampled at atmospheric pressure using a very low flow rate, which minimizes interference with the natural mass balance of gases in environmental systems, and allows the unbiased quantification of dissolved-gas concentrations in water by gas/water equilibration using membrane contactors (gas-equilibrium membrane-inlet mass spectrometry, GE-MIMS). The software toolbox for instrument control and data processing is open source, supporting the transparency, reproducibility and long-term value of the analysis results. The software allows flexible implementation of application-specific scripts for gas analysis and data processing. All miniRUEDI instruments are custom-built, and the design may be adapted to suit specific customer requirements.

Features:

- Analytical range: ppm-level to 100 %-v/v (tested using He, Ar and Kr in air-like gas matrices)
- Analytical uncertainty: 1–3 % typical (tested for He, Ar, Kr, N₂ and O₂ in air-like gas matrices)
- Calibration using ambient air as standard gas for analysis of He, Ar, Kr, N₂ and O₂ in air-like gas matrices
- 6 inlet ports for different gas samples (number of inlets can be increased on request)
- Low sample gas consumption (0.1 ml/min or less)
- Size and weight (including carrying case): 80 cm×52 cm×32 cm / 32 kg
- Power supply: 24 V(DC), runs off 110–230 V(AC) mains converter (included) or batteries, solar panels, etc.
- Power consumption: 50 W (normal operation)

Accessories:

- GE-MIMS membrane modules for dissolved gas analysis in water
- Total gas pressure sensors (e.g., for GE-MIMS analysis)
- Temperature sensors (e.g., for GE-MIMS analysis)

A complete description of the operational principles, performance tests, and application examples is available in *A Portable and Autonomous Mass Spectrometric System for On-Site Environmental Gas Analysis*, M.S. Brennwald, M. Schmidt, J. Oser, R. Kipfer. *Environmental Science and Technology*, 2016, 50 (24), pp 13455–13463, DOI: 10.1021/acs.est.6b03669.