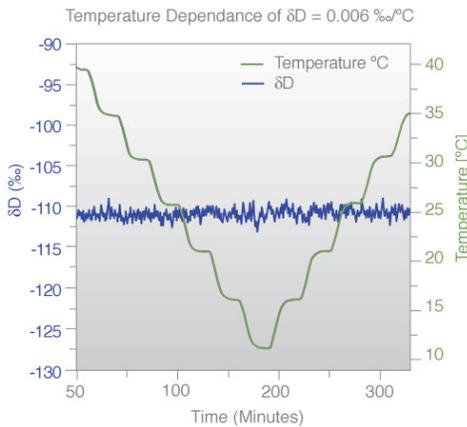
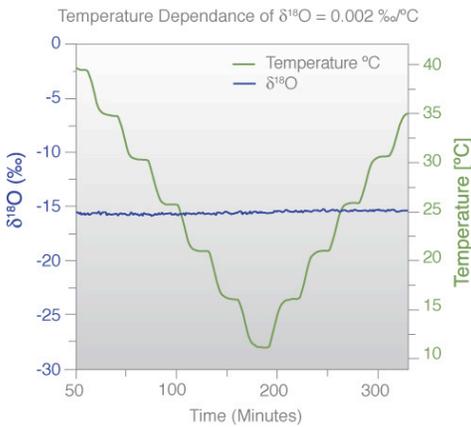


# PICARRO L2120-*i* $\delta D/\delta^{18}O$ Isotopic Water Analyzer

Highest precision, highest throughput and easiest-to-use

- One instrument for liquid and vapor measurements; lab precision and field robustness
- Simultaneous, high-precision  $\delta D$  and  $\delta^{18}O$  measurements
- Highest precision - better than IRMS performance - with A0211, high-precision vaporizer
- Unparalleled throughput - 750 injections per day - with A0212, high-throughput vaporizer
- Unique ChemCorrect™ software identifies and quantifies organic contamination



*Picarro's unmatched temperature and pressure control systems enable our water isotope analyzers to record data with precision and accuracy that is independent of fluctuating external conditions. These two data sets show that the absolute  $\delta^{18}O$  and  $\delta D$  values are unaffected even when the external temperature is stepped over a wide range,  $\sim 10 \text{ °C}$  through  $\sim 40 \text{ °C}$ . We challenge any other water isotope system to demonstrate such outstanding performance.*

L2120- <i>i</i> Performance Specifications		Precision, Guaranteed* (per sample)	Precision, Guaranteed* (per sample)	Drift, Guaranteed (peak to peak, 24 hrs)
Water Liquid Performance, Autosampler, High-precision*	( $\delta^{18}O$ )	< 0.1 ‰	< 0.05 ‰	< 0.6 ‰
	( $\delta D$ )	< 0.5 ‰	< 0.3 ‰	< 1.8 ‰
Water Liquid Performance, Autosampler, High-throughput*	( $\delta^{18}O$ )	< 0.2 ‰	< 0.1 ‰	< 0.6 ‰
	( $\delta D$ )	< 0.6 ‰	< 0.4 ‰	< 1.8 ‰
Water Vapor Performance*	( $\delta^{18}O$ )	< 0.2 ‰		< 0.6 ‰
	( $\delta D$ )	< 1.0 ‰		< 1.8 ‰

\* see appropriate data sheets for more information. For manual injections, these results are typical, not guaranteed. Water vapor performance guarantee requires Vapor Certification.

**Advantage Note:** Picarro's L2120-*i* provides both  $\delta^{18}O$  and  $\delta D$  isotope ratios with high precision in a single measurement. Researchers can use the L2120-*i* for either vapor or liquid data sampling and can switch between the two modes in seconds without recalibrating the analyzer or making configuration changes. The L2120-*i* comes in a compact single-module system, ideal for deployment in the field or in the lab.

System Specifications	
Measurement Technique	CRDS
Temperature	-10 to 45°C (vapor sample), 10 to 35 °C (liquid sample & system operating) -10 to 50 °C (storage)
Measurement Cell Temperature Control	Within 0.002 °C
Measurement Cell Pressure Control	Within 0.003 atm
Sample Pressure	300 to 1000 Torr (40 to 133 kPa)
Sample Flow Rate	~ 40 sccm at 760 Torr, no filtration required
Humidity	< 99% R.H. non-condensing @ 40°C (sample); <99% R.H. (ambient)
Accessories	Keyboard, mouse, LCD monitor (optional)
Outputs	RS-232, Ethernet, USB, analog (optional) 0 - 10 V
Fittings	¼" Swagelok®
Installation	Benchtop or 19" rack mount
Analyzer Dimensions	17" w x 7.5" h x 17" d (43.2 cm x 19.1 cm x 43.2 cm)
Analyzer Weight	45 lbs (20.4 kg)
Power	90-120 VAC, 50/60 Hz, 220 VAC, 50 Hz, < 150 W

The analyzer is ideal for applications as diverse as climate studies, paleoclimate reconstructions, isotopes in precipitation, ground and surface water tracers, aquifer dynamics, bird migration mapping, analytical hydrology tests, and metabolic activity. The instrument is configurable with unique vaporization modules for either high-precision or high-throughput experiments. These modules convert the liquid water sample to vapor phase in a flash process at high temperature. The vapor is then delivered into the laser cavity for analysis.

The instrument can also be equipped with a high-throughput, high-precision autosampler, capable of making consistent small injections into the vaporizer. The L2120-*i* can integrate with the A0101 Standards Delivery Module to schedule injections of isotopic water standards during long-term unattended vapor measurement campaigns. This system also comes equipped with ChemCorrect™, Picarro's unique post-processing software package that identifies and flags contamination from a broad range of organics, providing confidence in the accuracy of isotope ratios reported. In addition, ChemCorrect can quantify certain organics such as methane and methanol. Like all other Picarro analyzers, the L2120-*i* can be operated over the Internet, allowing researchers to collect data remotely, change experiment parameters and monitor instrument processes.

Leveraging Picarro's unique Cavity Ring-Down Spectroscopy (CRDS), the L2120-*i* is a time-based measurement system that uses a laser to quantify spectral features of gas phase molecules (specifically absorption lines unique to H<sub>2</sub><sup>16</sup>O, H<sub>2</sub><sup>18</sup>O, and HD<sup>16</sup>O) in an optical cavity. CRDS offers significant performance, ease-of-use and cost of ownership benefits compared to absorption based technologies, including ICOS. An effective path length of up to 20 kilometers provides exceptional precision and sensitivity. A patented, high-precision wavelength monitor maintains absolute spectral position, thereby ensuring accurate peak quantification. In addition, this technology guarantees that only the spectral features of interest are being monitored, greatly reducing the analyzer's sensitivity to interfering species.

Picarro's optical cavities incorporate precise temperature and pressure control systems, ensuring accurate measurements over long periods of time, even in the harshest environments. As a result, the analyzer maintains high linearity, precision, and accuracy with minimal calibration required. For researchers, the L2120-*i* delivers a best-in-class combination of flexibility, speed, high-precision, and ease-of-use that sets a new standard for water isotope analyzers.