

# High-Precision Vaporizer and Autosampler

Highest precision isotope analysis of liquid water samples

# PICARRO



- Automated and simultaneous, high-precision measurements of  $\delta^{18}\text{O}$ ,  $\delta^{17}\text{O}$ ,  $\delta^2\text{H}$  and  $^{17}\text{O}$ -excess
- Choice of operating modes: Standard, Express and Survey
- User-friendly software reduces training, while maintaining flexibility to meet the demands of your application
- Accepts a range of samples, including briny water, TDS <200 mg/kg
- Installs in minutes, minimal training required

The **Picarro A0211 High-Precision Vaporizer** pairs with the **A0340 Autosampler** delivering high precision and automation in a user-friendly solution. When fully integrated with either Picarro's L2130-*i* or L2140-*i* Cavity Ring-Down Spectroscopy (CRDS) analyzer, expect better performance than Isotope Ratio Mass Spectrometers (IRMS) with higher throughput at a lower cost.

Picarro's isotopic water solution is robust enough for field deployment in remote locations or at sea. With limited maintenance requirements, the High-Precision Vaporizer can be cleaned with water. Both the High-Precision Vaporizer and Autosampler are versatile, offering customizable tray and sample handling method options to tailor fit your application. The optional C0354 Salt Liner for the Vaporizer enables analysis of samples with high total dissolved solids (TDS).

Unlike other measurement technologies, the Picarro system requires minimal calibration. Picarro's isotopic analyzers can run non-stop for hours, minimizing downtime and maximizing the productivity of your investment. The Picarro A0211 High-Precision Vaporizer and A0340 Autosampler fully integrate

with either the L2130-*i* or L2140-*i* analyzer. This combination offers exceptional guaranteed precision, simple maintenance, and proven performance for paleoclimatology, hydrology and other applications.

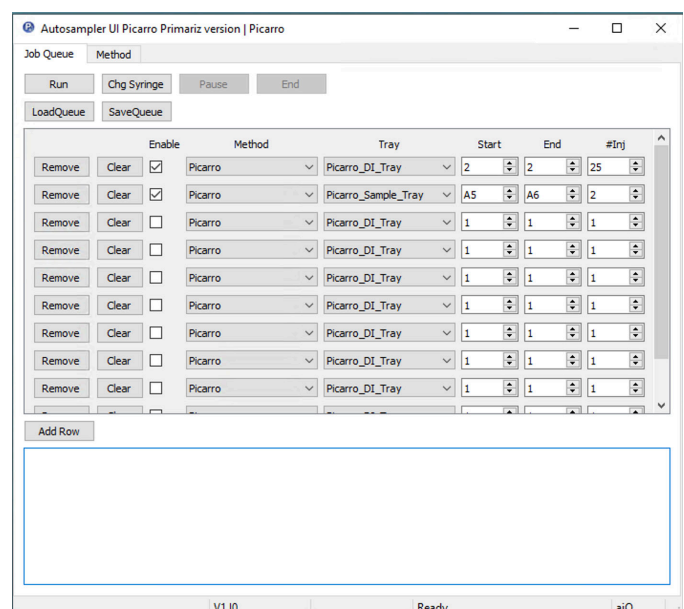


Figure 1 - Autosampler Controller Software Graphical User Interface

| L2140- <i>i</i> Liquid Specifications*<br>(with A0211 and A0340) | Guaranteed Performance   | Typical Performance**   |   |
|--|--|---|---|
|  |  | Standard mode   | Express mode***   |
| <b>Precision (1σ)</b>  | $\delta^{18}\text{O} - 0.025\text{‰}$<br>$\delta^2\text{H} - 0.1\text{‰}$<br>$\delta^{17}\text{O} - 0.025\text{‰}$<br>$^{17}\text{O-excess} - 0.015\text{‰}$ | $\delta^{18}\text{O} - 0.010\text{‰}$<br>$\delta^2\text{H} - 0.05\text{‰}$<br>$\delta^{17}\text{O} - 0.012\text{‰}$<br>$^{17}\text{O-excess} - 0.008\text{‰}$ | $\delta^{18}\text{O} - 0.015\text{‰}$<br>$\delta^2\text{H} - 0.05\text{‰}$<br>$\delta^{17}\text{O} - \text{N/A}$<br>$^{17}\text{O-excess} - \text{N/A}$ |
| <b>Maximum 24-hour Drift</b><br>(vapor & liquid)                 | $\delta^{18}\text{O} - 0.2\text{‰}$<br>$\delta^2\text{H} - 0.8\text{‰}$<br>$\delta^{17}\text{O} - 0.2\text{‰}$<br>$^{17}\text{O-excess} - 0.2\text{‰}$       | $\delta^{18}\text{O} - 0.06\text{‰}$<br>$\delta^2\text{H} - 0.30\text{‰}$<br>$\delta^{17}\text{O} - 0.053\text{‰}$<br>$^{17}\text{O-excess} - 0.039\text{‰}$  | $\delta^{18}\text{O} - 0.100\text{‰}$<br>$\delta^2\text{H} - 0.43\text{‰}$<br>$\delta^{17}\text{O} - \text{N/A}$<br>$^{17}\text{O-excess} - \text{N/A}$ |
| <b>Throughput Per Day</b>  | Standard mode - up to 162 injections<br>Express mode - up to 500 injections<br>Survey mode - up to 900 injections  | 54 minutes per sample / 27 samples per day  | 29 minutes per sample / 50 samples per day  |
| <b>Memory Removal</b>  | (after the 3rd injection)<br>$\delta^{18}\text{O} - 99\%$<br>$\delta^2\text{H} - 98\%$<br>$\delta^{17}\text{O} - 99\%$<br>$^{17}\text{O-excess} - 99\%$      | (after the 3rd injection)<br>$\delta^{18}\text{O} - 99\%$<br>$\delta^2\text{H} - 98\%$  | (after 15 min)<br>$\delta^{18}\text{O} - 99\%$<br>$\delta^2\text{H} - 98\%$   |

\* Specifications are tested for each unit and based on specific accessories. Please contact Picarro to learn more about the rigorous testing process and application specific accessories.

\*\* Typical performance is defined as the median of testing results from a number of sequentially built L2140-*i* analyzers. Results available upon request.

\*\*\* Only applicable for  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$  mode

| A0340 Autosampler Performance |   |
|-------------------------------|---|
| Parameter                     | Notes   |
| Maximum number of vials       | 130   |
| Syringe                       | Picarro recommends SGE 10 $\mu\text{L}$ syringes, additional syringes from other manufacturers are approved   |
| Software                      | Onboard software allows you to control multiple jobs (each with a sequential set of vials) with different user-editable methods   |
| Operating System              | Windows 10 / Windows 7 with appropriate Windows 10 Upgrade Kit  |
| Features                      | <ul style="list-style-type: none"> <li>Easily run drift tests from wash station</li> <li>Remote operation (start new run, stop current run, edit methods and job queue) using Teamviewer or other remote access tool</li> </ul> |
| Training                      | Trained in less than 5 minutes using onboard software   |
| Dimensions                    | 22" w x 30" h x 29.5" d (55.7 x 77.0 x 75.0 cm)   |
| Weight                        | 23.15 lbs (10.5 kg) (without sample tray and waste station)   |
| Power Requirement             | 90–264 VAC, 47–63 Hz  |

| A0211 High-Precision Vaporizer System Requirements |  |  |
|--|--|--|
| Parameter  | Notes  | Quantity   |
| Operational Gas Flow                               | $\text{N}_2$ or Zero Air (< 100 ppm $\text{H}_2\text{O}$ ) | <100 sccm  |
| Standby Gas Flow                                   | $\text{N}_2$ or Zero Air (< 100 ppm $\text{H}_2\text{O}$ ) | <50 sccm   |
| Start Up Power                                     | 100-240 VAC, 50/60 Hz                                      | <700 W<br><910 W (with pump)   |
| Operational Power                                  | 100-240 VAC, 50/60 Hz                                      | <60 W<br><210 W (with pump)  |
| Dimensions   | Fits above analyzer  | Vaporizer: 6.3" w x 4.5" h x 15.9" d (16 x 12 x 41 cm)<br>External Pump: 6.1" w x 8.7" h x 13.6" d (15.5 x 22 x 34.5 cm) |
| Weight   | Supported by Autosampler                                   | Vaporizer: 12 lbs (5.4 kg)<br>External Pump: 14.3 lbs (6.5kg)  |