



PAL3 Autosampler System

# EXPAND CAPABILITIES WITH MULTIPLE INJECTION TECHNIQUES

The Measure of Confidence



**Agilent Technologies**

## INCREASE YOUR LAB'S PRODUCTIVITY BY ENHANCING YOUR INJECTION CAPABILITIES

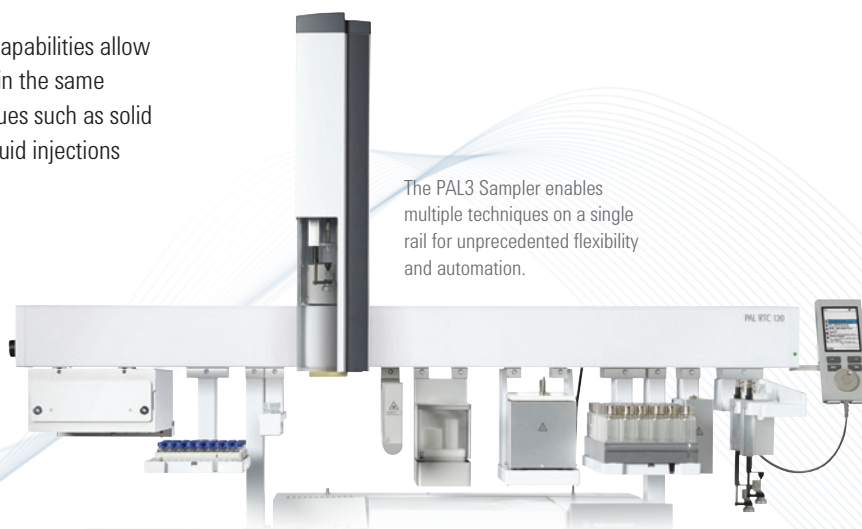
Every day, you perform several types of sample injection and manipulation. However, without reliable automation, your analyses may be vulnerable to errors in technique and repeatability.

### Take your autosampler to a new level of expansion, automation, and diversity with the PAL3 Autosampler from CTC

This versatile system, offered by Agilent Technologies, is more than just an autosampler. It is a fully integrated sample preparation and introduction system that automates heating, chilling, mixing, preconcentration, derivatization, dilution, and other sample preparation steps essential to your daily operations.

But that's not all. New Robotic Tool Change (RTC) capabilities allow the autosampler to change tools automatically within the same method and sequence. So you can perform techniques such as solid phase micro-extraction (SPME), headspace, and liquid injections without pausing your GC operation.

The PAL3 Sampler enables multiple techniques on a single rail for unprecedented flexibility and automation.



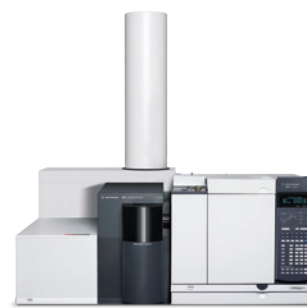
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Liquid? Headspace? SPME?

## Now you can do all three techniques in the same method and sequence

The mechanical precision and robustness of the PAL3 Sampler form the basis for precise, accurate handling of gaseous and liquid samples. In addition, you can adapt or extend the PAL3 Sampler to increase sample capacity... add injection or switching modules... to meet the unique requirements of your lab.

### Use multiple sampling techniques in a single method and sequence

The Agilent PAL3 injection system changes injection techniques automatically, allowing you to perform the following techniques on a single autosampler:

- **Liquid injection:** Fast liquid injection minimizes discrimination and supports syringe volumes from 1.2  $\mu\text{L}$  up to 10,000  $\mu\text{L}$ .
- **Headspace injection:** Capabilities include temperature control from 40  $^{\circ}\text{C}$  to 150  $^{\circ}\text{C}$  with magnetic vial transport for 2 mL, 10 mL, and 20 mL vials. Available in 1 mL, 2.5 mL, and 5 mL syringes flushed with inert gas.
- **Solid Phase Micro-Extraction (SPME) injection:** Reduces sample preparation time and eliminates the need for large volumes of extraction solvents. A variety of SPME fibers are available (10 mm or 20 mm lengths), along with a Fiber Conditioning Module.

### Integrate smoothly with Agilent GC and GC/MS systems

PAL3 Injectors work with any Agilent 7890 series GC or GC/MS system. Specialized controls are also available for all OpenLAB software editions and MassHunter software.

## Automated sample preparation capabilities and solutions



### 120 cm rail

Enables multiple techniques for maximum versatility.



### Barcode Reader

Two scanners accurately read barcodes on 2 mL, 10 mL, and 20 mL vials regardless of orientation. Automatically flags reports if method and vial do not match.



### Vortex Mixer

Allows efficient mixing (up to 2000 rpm) for dilution/extraction sample preparation. Accommodates standard vial sizes (2 mL, 10 mL, and 20 mL) with one additional custom slot.



### Agitator

Incubates samples from 20  $^{\circ}\text{C}$  to 200  $^{\circ}\text{C}$  and agitates samples from 250 rpm to 750 rpm. Accommodates six 20 mL vials with optional adapters for 2 mL or 10 mL vials.



### Peltier Chiller

User configurable for storing 2 to 6 racks or plates under defined temperature conditions (4  $^{\circ}\text{C}$  to 40  $^{\circ}\text{C}$ ). Accommodates any combination of multi-titer and deep well plates.



### Robotic Tool Change (RTC)

Safely automates most sample preparation steps. Holds up to three tools with automated tool changing during operation. Script writing available.



### Intuitive software

Full integration with OpenLAB CDS Editions and MassHunter GC/MS Software makes PAL3 operation easy.



### Agilent CrossLab Supplies

Deliver seamless, reliable performance for every instrument in your lab.

Learn how to optimize the benefits of automation at [agilent.com/chem/PAL3](http://agilent.com/chem/PAL3)

# MAXIMIZE VERSATILITY WITH THREE LEVELS OF AUTOMATION

## LSI liquid injection gives you perfect injections, reproducible results

The PAL3 LSI (available with the 85 cm rail) is designed for the precise, accurate handling of liquid samples up to 100  $\mu\text{L}$  in volume. The PAL LSI is fully controlled by OpenLab and Masshunter and gives you complete control over aspirating and dispensing parameters for liquid samples – which is crucial for perfect injections.

In addition, the PAL3 LSI can inject from various sample containers into different detectors, or transport vials, from a tray to a temperature-controlled stack. A range of syringes from 1.2  $\mu\text{L}$  to 100  $\mu\text{L}$  is available.

## Make RSI automation your sample prep workhorse

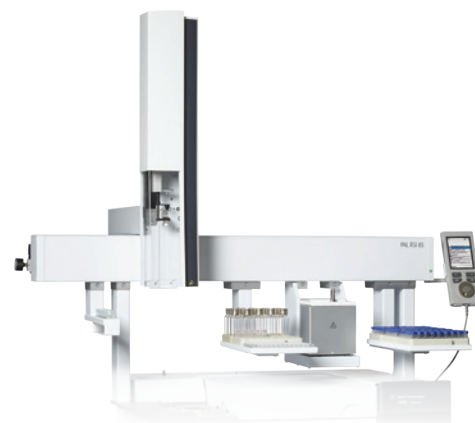
Cost-effective RSI automation combines liquid, headspace, and SPME injection into one instrument, allowing you to quickly switch from one application to another on the same GC workstation.

Whether your method and sequence require split/splitless or on-column injection – or you process samples in headspace, liquid or SPME mode – your new instrument setup can be ready in minutes.

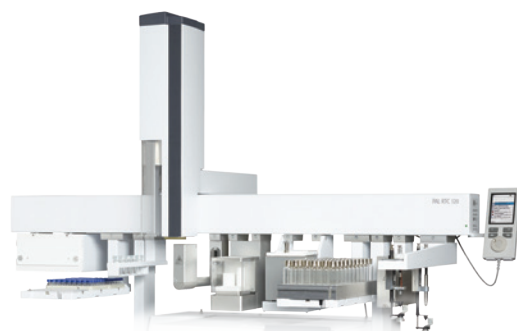
Choose from an 85 cm rail or a high-capacity 120 cm rail.

## RTC: a new (r)evolution in autosampler automation

The Robotic Tool Change (RTC) platform safely and efficiently automates most sample preparation steps. Its robotic tool change capability maximizes lab productivity by allowing unattended 24/7 operation – even for multistep workflows. (Available with the 120 cm RSI rail only.) You can automatically switch tools as your requirements change.



PAL3 RSI



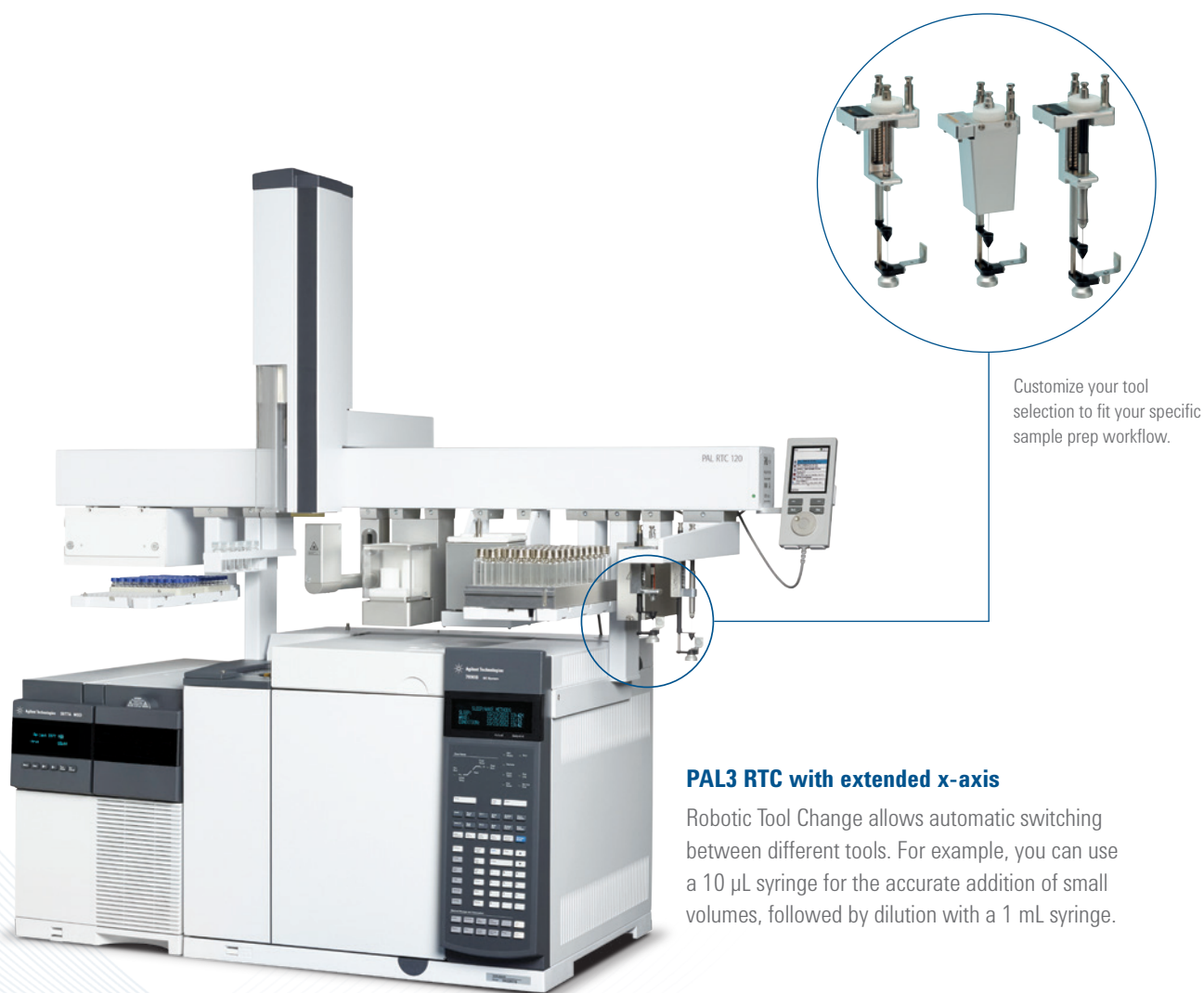
PAL3 RTC

# ALL ABOUT PRODUCTIVITY: THE PAL3 RTC

PAL3 RTC lets you change from liquid injection... to headspace... to SPME... and even dilution or derivatization, fully unattended. The ability to perform multi-step preparation procedures eliminates repetitive error-prone manual tasks.

## Take sample prep to an even higher level with our RTC Park Station

The unique Park Station permits RTC capabilities to accommodate up to three injection tools or syringes with different volumes. It is ideal for advanced sample preparation tasks, such as liquid handling (dilutions), derivatization, or other repetitive, error-prone steps.



Learn how to optimize the benefits of automation at  
[agilent.com/chem/PAL3](http://agilent.com/chem/PAL3)



## Streamlined Method Editor easily generates new methods, even for complex workflows

In addition to simplifying your daily operations, the PAL3 comes with templates which can be modified or adapted for generating tailored method. Every PAL3 Sampler includes method templates and building blocks (tasks) for specific functions – such as headspace injection and partial loop liquid injection. These allow you to easily tailor or optimize your specific workflows.



Method Editor is a powerful tool to generate custom methods.

## Need more customization? Script Writing Services can help



Typically, the more options you choose, the longer and more complex your startup process can be. To get you up and running faster, Agilent includes custom Script Writing Services when you purchase the RTC option. Our four-step process makes it simple:

**Step 1: Consult** with an Agilent Software Programming Engineer to identify the process and procedures to be automated with the script.

**Step 2: Review and Confirm** with your Agilent Engineer exactly how the script will behave.

**Step 3: Develop** the script and review performance against requirements defined in Steps 1 and 2.

**Step 4: Deploy** the final script.

For more information on Script Writing Services visit: [agilent.com/chem/PALscriptwriting](http://agilent.com/chem/PALscriptwriting)

Let us customize a method for your specific needs.  
Go to [agilent.com/chem/PAL3](http://agilent.com/chem/PAL3)

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