

Thermo Scientific TriPlus RSH Autosampler

Integrated sampling system

The Thermo Scientific™ TriPlus™ RSH autosampler offers exceptional precision, flexibility, and productivity in robotic, sample-handling solutions. Compatible with Thermo Scientific GC and GC/MS systems, the autosampler sets new standards in automation and provides advanced liquid-handling cycles that enable automated functionality beyond traditional liquid, headspace, and solid-phase microextraction (SPME*) injections.

Integrated Sampling System

The TriPlus RSH autosampler expands automated capabilities beyond sample injections to advanced sample-handling cycles. Automating the whole workflow, from sample preparation to injection, increases precision and reproducibility and enables unprecedented flexibility and productivity in GC and GC-MS sampling.

Ultimate Productivity

Designed for expanded productivity, this integrated sampling system accommodates large sample capacities supporting full, unattended 24/7 operation. As an example, a maximum of 972, 2 mL vials combined with multiple 100 mL wash/waste bottles enable week-end long unattended operations – a goal not attainable with most other sampling systems currently on the market.

Unmatched Flexibility

The TriPlus RSH robotic sample-handling system offers liquid, headspace, and solid phase microextraction – capabilities you expect as being a standard part of a multi-axis autosampler. In these modes, the sampling system delivers the precision you demand for achieving exceptional results. Scalable capabilities enable expanded GC and GC-MS application ranges, accurate micro-sample injections, and the matching of techniques to sample types.

Seamless Operation

Accurate automation of a multitude of traditionally manual tasks is enabled by a new and innovative ATC (Automatic Tool Change) capability. The ATC feature enables the user to set up a sequence using up to six different syringes, automatically loaded by the autosampler to accurately perform dilutions, calibrations, and sample injections. The ability to exchange syringes for different tasks enables high-precision sample handling in a single, unattended sequence prior to automated sample injection.

TriPlus RSH Configurations

The TriPlus RSH autosampler is available in the following configurations:

- TriPlus RSH for automated liquid sampling
- TriPlus RSH for static headspace automation
- TriPlus RSH for automated liquid and headspace sampling and injection

Additional upgrade kits are available to transform existing versions into multitechnique platforms.



Features and Technical Specifications

Description –

XYZ robotic sample handling apparatus with automatic syringe switch concept. When the optional accessories are installed, the system is capable of automating sample preparation steps like standard dilution, standard addition, sequential dilution, derivatization and vortexing.

Communication –

Two independent LAN

Local User Interface –

LED status indicators. Optional control panel with 4 keys, round knob, and graphical LCD display

Instrument Control –

Thermo Scientific chromatography data systems integrated with Virtual Terminal software to completely mimic the physical controller

Teaching Functions –

Manual without using tools or external devices

Injector Compatibility –

Compatible with on-column, programmable temperature vaporizing, packed, purged packed, split-splitless injectors

High Throughput Configuration –

Dual GC set-up with Double Pro and Confirmation modes: Single TriPlus RSH serving two independent GC or GC/MS systems, for liquid, HS or SPME sample injection or for sample preparation, using the same or two different software systems. Two different methods can be used. Rapid Mode starts the syringe washing cycle during the current GC cooling phase.

Barcode Reader –

Two active laser scanners for all standard vials using 1-dimension barcodes in a horizontal orientation

Vortexer –

Intensive mixing of 0.5, 0.7, 2, 5, 10, or 20 mL vials with an agitation speed up to 2000 rpm

Vial Trays –

Heated and cooled trays expand the range of available applications from sample injection to sample/standard preparation

GC Mounting Kits –

Thermo Scientific TRACE™ 1300 GC, TRACE 1310 GC, TRACE GC Ultra and FOCUS GC

Configuration for Liquid Sampling

Vial Volumes –

300 μ L fixed insert vials, 0.5, 0.7, 2, 2.5, 10, and 20 mL. 96/384 Microtiter or Deep Well plates with Automatic Foil Cutter to pierce alumina or plastic foils prior the needle penetration.

Bottom-Sensing Vials –

Capable of liquid injection starting from small-volume samples. Capability to inject from samples as low as 5 μ L into a vial. Possibility of performing up to three 1 μ L injections from a 5 μ L sample, depending on vial type.

Height from Vial Bottom – User selectable between 0.1 and 32 mm in 0.1 mm steps

Injection Speed for Liquid Samples –

Selectable from 0.1 μ L/sec up to 2000 μ L/sec and fully programmable

Sample Capacity (Depending on autosampler, GC and MS configurations)

- Up to 4608 well plates or 6912 well plates with extended X-arm
- Up to 840 0.5/0.7 mL vials or 1260 0.5/0.7 mL vials with the extended X-arm
- Up to 648 2 mL sample vials or 972 2 mL vials with the extended X-arm
- Up to 240 10 mL or 20 mL vials or 360 10 mL or 20 mL vials with the extended X-arm

Syringes (Capable of handling liquid volumes in the range 0.1 μ L – 10 mL) –

Capable of using 0.5 μ L, 1.0 μ L, 5 μ L, 10 μ L (standard), 25 μ L, 50 μ L, 100 μ L, 250 μ L, 500 μ L, 1000 μ L, 10000 μ L syringes for sample injection and/or volume transfer

Syringe Cleaning –

Wash stations for up to 4 different solvents for a total of 40 mL (standard). Optional large washing stations for up to 3 \times 100 mL solvent bottles. Waste: 1 \times 10 mL or drain to external waste bottle. Possibility to install multiple solvent stations to expand solvent and waste volumes.

Options

- Upgrade to headspace option and its own accessories
- Upgrade to SPME option (with or without headspace option)
- Peltier-controlled drawer for well plates, 300 μ L fixed insert vials, 2 and 10 mL vials. Temperature selectable between 0 and 40 $^{\circ}$ C
- Cooled trayholders for well plates, 300 μ L fixed insert vials, 2, 10 and 20 mL vials. Temperature selectable between 4 and 70 $^{\circ}$ C. Requires external circulator bath.
- Solvent/reagent reservoir
- Large Volume Wash Station

Injection Volume –

Range from 0.1 to 10,000 μ L in 0.1 μ L steps to 100 μ L and 1 μ L steps between 100 μ L and 10 mL. Needle lengths: 57 mm or 85 mm.

Liquid Injection Modes –

8 fully customizable method-specific preset menus available:

- Basic enrichment
- Enrichment needle solvent wash
- Internal standard double
- Internal standard post
- Needle solvent wash
- Solvent flush double
- Solvent flush post

Typical Performance –

\leq 0.3 RSD % obtained under Thermo Scientific standard conditions

Configuration for Headspace

Vial Volumes –

2, 10 and 20 mL

Syringe Sizes –

1, 2.5, and 5 mL

Sample Capacity (Depending on autosampler, GC and MS configurations) –

Up to 180 10 or 20 mL vials or 300 10 or 20 mL vials with the extended X-arm

Injection Volume Range –

0.1 to 5 mL in 0.1 mL steps depending on syringe

Syringe Temperature –

OFF or 40 $^{\circ}$ C to 150 $^{\circ}$ C in 1 $^{\circ}$ C steps

Incubation Oven Capacity –

6 vials

Incubation Oven Temperature Range –

40 to 200 $^{\circ}$ C in 1 $^{\circ}$ C steps, with agitation

Incubation Time –

0.1 to 600.0 min in 0.1 min increments

Syringe Flush Capability –

With inert gas

Solvent Syringe Cleaning –

Optional washing stations (4 \times 10 mL or 2 \times 100 mL vials)

Multiple Headspace Extraction –

Yes (optional accessory)

Enrichment Sampling –

Yes with optional kit for cold trap

Injection Speed –

1 to 100 mL/min, in 1 mL/min increments

Typical Performance –

\leq 0.7 RSD % under Thermo Scientific standard conditions

Needle Lengths –

65 mm, compatible with every injector port

Options

- Upgrade to Liquid option
- Upgrade to SPME option
- Peltier-cooled trayholder for 300 μ L fixed insert vials, 2 and 10 mL vials; temperature selectable between 0 $^{\circ}$ C and 40 $^{\circ}$ C
- Cooled trayholders for 300 μ L fixed insert vials, 2, 10 and 20 mL vials; requires external circulator bath; temperature selectable between 4 $^{\circ}$ C and 70 $^{\circ}$ C
- SPME Fiber Cleaning Station
- Solvent/reagent reservoir
- Large Volume Wash Station

Solid Phase Micro Extraction Option

Vial Volumes –

2, 10 and 20 mL

Sample Capacity –

Depending on Autosampler, GC and MS configurations:

- Up to 840 0.5/0.7 mL vials or 1260 0.5/0.7 mL vials with the extended X-arm
- Up to 648 2 mL sample vials or 972 2 mL vials with the extended X-arm
- Up to 180 10 or 20 mL vials or 300 10 or 20 mL vials with the extended X-arm

Incubation Oven Capacity –

6 vials

Incubation Oven Temperature Range –

40 $^{\circ}$ C to 200 $^{\circ}$ C in 1 $^{\circ}$ C steps, with agitation

Vial Penetration Depth –

Standard or custom between 5 mm and 20 mm, suitable for liquid or headspace extraction

Fiber Conditioning Station –

Optional, 2-ports and a needle guide, 40–350 $^{\circ}$ C, inert gas purged. Fiber: 23 gauge. One fiber holder to automate all fibers.

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