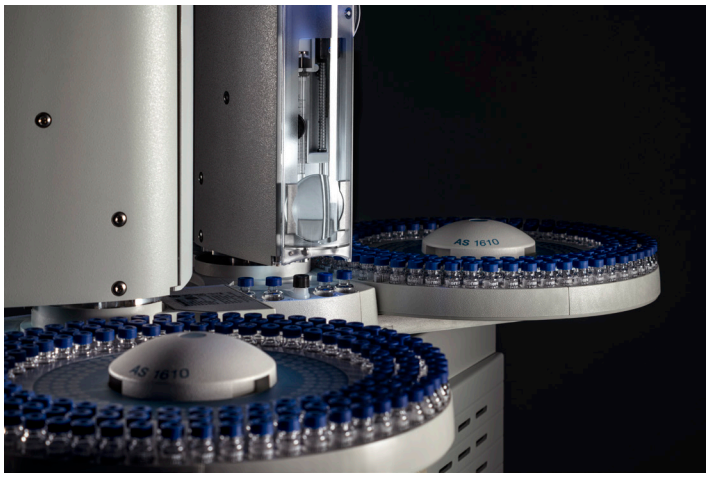
# Thermo Scientific AI/AS 1610 Liquid Autosampler

## Benefits

- Elevate user experience with key features that facilitate liquid sampling automation for GC and GC-MS
- Simplify operations with self-alignment for quick and easy setup for new and experienced users
- Make operations safer with automatic selection of the best injection settings
- Relieve daily workload and simultaneously run sample batches in parallel channels with a simplified dual-tower Gemini configuration control and connectivity
- Fit any workload demand with scalable, large sample capacity, and minimize run-to-run cycle time through overlapping operations capabilities
- Be empowered with flexibility to analyze small and large sample volumes




The Thermo Scientific™ AI/AS 1610 Liquid Autosampler is the best quality-to-price solution for the budget conscious laboratories performing high throughput and QA/QC essential testing. It is designed to meet the highest reliability and durability requirements with easy self-alignment capability.

The sample capacity is scalable to fit the most demanding workload, which can expand up to 310 samples using the Gemini configuration, providing maximum efficiency with simple setup, connection and control. Sample throughput is maximized by reducing the sample-to-sample analytical cycle time with pre-injection operations performed in the previous run.

The AI/AS 1610 platforms enhance performance and usability for both new and experienced users. Safer operations are ensured by recognizing the injector type and injection mode and automatically setting the best injection parameters. Additionally, the syringe is kept away from the inlet's temperature, preserving compounds with low boiling points. Effective syringe washing capability with up to four solvent types is also available to ensure robust and reliable operation.

## System features

### Removable trays

- AI 1610 Autoinjector — The 8-position vial holder can easily be removed and replaced. Each vial holder can be labeled and used for sample preparation or storage.
- AS 1610 Autosampler — The 155-position rotating carousel can be easily removed and replaced for sample preparation or storage.

### AI and AS 1610 Gemini configurations

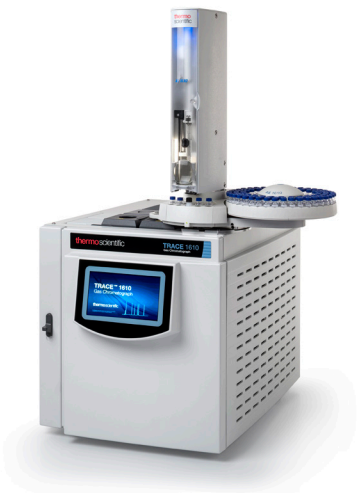
The Gemini configuration can simultaneously operate two autosamplers on two parallel channels. This configuration is available for both the AI 1610 Autoinjector and the AS 1610 Autosampler.

Controlled by the Thermo Scientific Chromatography Data System (CDS), the Gemini configuration can operate in two modes:

- High-throughput mode: large sample batches can run in parallel on two identical analytical channels, with the same or different sampling method, doubling the productivity of the GC
- Confirmation mode: run the same sample sequence in parallel on two different analytical channels, using the same sampling method to generate a single data set with two channels

### Injection features

- Fast injection in less than 100 ms



AS 1610 (155-vial tray) on the front channel of the TRACE 1610 GC

AI 1610 (8-vial tray) on the front channel of the TRACE 1600 GC

AI/AS 1610 syringe compartment with magnifying lens

### Rapid Mode

- Rapid Mode optimizes the analysis cycle time by performing pre-injection operations while running the previous sample

### Usability

- Self-alignment for quick and easy setup
- Illuminated syringe compartment for easy syringe viewing and replacement
- Magnifying lens for enhanced syringe scale reading
- Enhanced color-coded instrument status indication: Ready, Run, Maintenance/Error

### Control

Seamless integration with Thermo Scientific Chromatography Data Systems (CDS):

- Thermo Scientific™ Chromeleon™ CDS
- Thermo Scientific™ TraceFinder™
- Thermo Scientific™ XCalibur™

### Connectivity

- AI/AS turret connects on the back of the Thermo Scientific™ TRACE™ 1600 Series Gas Chromatograph (GC) with one single cable for communication, synchronization and power supply

## System specifications

### Sample loading capacity

- 8 vials (AI 1610 Autoinjector), upgradable to 155 vials

- 155 vials (AS 1610 Autosampler)
- 16 vials (AI 1610 Gemini configuration), upgradable to 310 vials
- 310 vials (AS 1610 Gemini Configuration)
- Vial capacity: 2 mL
- Optional micro-volume vial: 300 µL
- Compatible with screwed, crimped, and snap-capped vials

### Syringes
- Compatible with standard, gas-tight and plunger in-needle syringes
- Syringe volume: 0.5 µL, 5 µL, 10 µL, 50 µL and 100 µL (50 mm needle length) with the same syringe holder

### Injection parameters
- Maximum injection volume: 80 µL (with 100 µL syringe)
- Minimum injection volume: 5 nL (with 0.5 µL syringe)
- Injection volume: 1-50% for 0.5 µL, 5 µL and 10 µL syringes, 1-80% for 50 µL and 100 µL syringes
- Increments: 1% of the syringe volume

### Syringe rinsing
- Solvent bottles: 4 x 4 mL
- Pre- and/or post-injection syringe wash: 0-15 rinses
- Syringe wash with up to four different solvents in user's selectable combinations and optimized solvent volume
- Solvent saving option to minimize solvent consumption, with selectable percentage of syringe volume
- Waste bottle capacity: 40 mL

### Sample taking
- Two selectable vial sampling depths
- Programable filling strokes for bubble elimination (0-15 strokes)
- Selectable sample pre-washes (0-15 pre-washes)
- Viscous sample management with selectable sample drawing speed (Fast/Slow/Custom) and programmable viscosity delay (0-7 s)
- Selectable volume of air plug after sample
- 2-layer injection mode: layers and air gaps user definable volumes (i.e., sandwich injection, internal standard, or in-needle derivatization)

### Optimized injection modes
AI/AS 1610 Autosampler is compatible with iConnect Split/Splitless (SSL), Programed Temperature Vaporizer (PTV), and Thermo Spray Split Splitless Injector (TSI). The injection settings are automatically selected and optimized according to the injector type and injection mode recognized by the Thermo Scientific CDS.

Variable parameters depend on the injection mode:

For all injectors:

- Injection speed: Fast/Slow/Custom (1-60,000.00 µL/min)

Additionally, for PTV in on-column mode and TSI injector:

- Variable pre- and post-injection delay (0-63 s)

Additionally, for TSI SSL injector:

- Selectable penetration depth (standard/minimum)

## Chromatographic performance
### Area repeatability
- <0.3% RSD for C16 in heptane. Data obtained on ten subsequent splitless analyses from 1 µL injected volume

### Sample discrimination
- C40/C20 >0.95 with SSL injector

### Carryover
- <0.001% measured by the residual area in a heptane blank following the injection of pure C16, using five post-washes with solvent A and five post-washes with solvent B

### Linearity
- <4% RSD on response factor between 10% and 50% volume

## Installation requirements

### GC Compatibility

- Compatible with TRACE 1600 Series GC
- Compatible with Thermo Scientific™ TRACE™ 1300 Series GC (requires cabling adapter)

### Power supply

- No power supply required when installed on TRACE 1600 Series GC
- 90W AC-DC single output power adapter (IN: 90~264VAC 47~63Hz/OUT:24VDC) when installed on a TRACE 1300 Series GC

### Sound pressure level

- <70 dBA (dBA = A weighted sound pressure level)

AS 1610 Gemini configuration on the TRACE 1610 GC – side and top view

## Environment

- Indoor use only
- Up to 3500 meters altitude over sea level
- Operating temperature: 15 °C to 35 °C (59-95 °F)
- Storage temperature: -30 °C to 70 °C (-22-158 °F)
- Maximum RH% 80, non-condensing

## Safety and regulatory certifications

Conforms to the following safety standards:

- International Electrotechnical Commission (IEC): 61010-1:2010 AMD1:2016 – 61010-2-010:2019 -61010-2-081:2019
- CAN/CSA C22.2 No. 61010-1A AMD1:2018 and UL 61010-1:2012
- EuroNorm (EN): 61010-1:2020 – 61010-2-010:2015 – 61010-2-081:2015

Conforms to the following regulations on Electromagnetic Compatibility (EMC) and Radio Frequency Interference (RFI):

- CISPR 11/EN 55011: Group 1 Class A
- IEC 61326-1:2020
- EN 61326-1:2018
- Designed and manufactured under a quality system registered to ISO 9001
- Declaration of conformity available

## Dimensions and weights

### Dimensions (depth x width x height)

- AI 1610 Autoinjector: 280 x 230 x 400 mm (11 x 9 x 15.7 in)
- AS 1610 Autosampler: 290 x 470 x 400 mm (11.4 x 18.5 x 15.7 in)

### Weight

- AI 1610: 6 kg (13.2 lb)
- AS 1610: 7 kg (15.4 lb)

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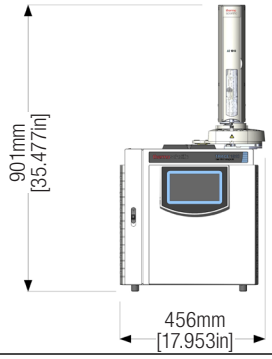
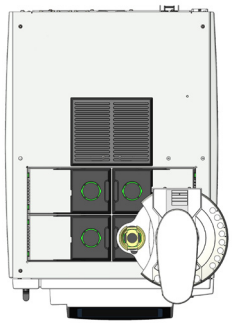
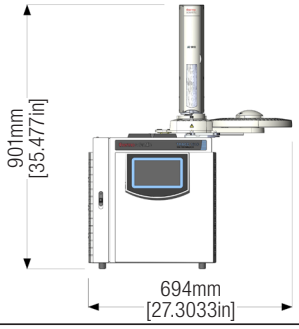
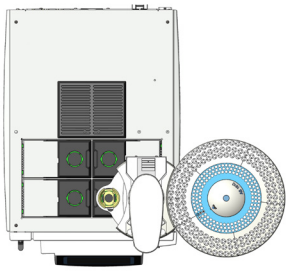
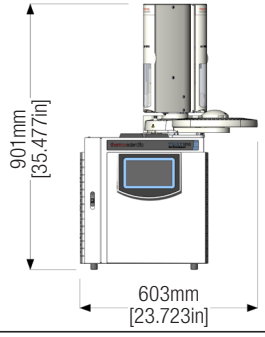
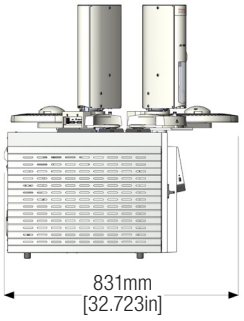
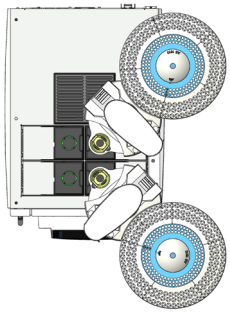
| Combination with TRACE 1610 GC | Front View | Side View | Top View |
|---|---|---|---|
| AI 1610 |  |  |  |
| AS 1610 |  |  |  |

| Combination with TRACE 1610 GC | Front View | Side View | Top View |
|---|---|---|---|
| Gemini AI 1610 |  |  |  |
| Gemini AS 1610 |  |  |  |

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