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Agilent 7693A Automated Liquid Sampler

Specifications

Overview

The Agilent 7693A is a state-of-the-art sample handling and injection system that provides the highest levels of precision and reliability for gas chromatographic sampling. The 7693A is a complete redesign of the most popular gas chromatographic sample introduction system in history. It takes advantage of the latest technology to offer greater reliability and performance.

The 7693A system consists of:

- Injection Tower
- Sample Tray
- Heater/mixer/bar code reader
- Enhanced Sample Handling Syringe Carriage
- Heater/chiller module
- Controller board for use with 6890 Plus
- Controller for use with 6890A

Compatibility

Agilent 7890A and 7890B gas chromatograph system
Agilent 6890N, 6890 Plus, and 6890A gas chromatographs
Agilent 6850N and 6850A gas chromatographs (injector only)
Agilent 7820 gas chromatograph (injector only)
Agilent 5975T GC/MSD

Chromatographic Performance

- Sample discrimination $\leq 10\%$ ¹
- Better than 0.3% RSD area reproducibility²
- Less than 5% RSD in response factor variation³
- Less than 1 part in 100,000 carryover⁴

Injection Features

- Fast and on-column default injection types
- Fully programmable dispense rate, draw rate, and injection rate
- Fast injections are performed in less than 100ms

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- Support of 250- 500µL syringes with optional Enhanced Sample Handling Syringe Carriage
- User-definable sandwich injection mode
- Transfer turret can hold up to three 2-mL vials at once for use with advanced sampler capabilities
- Active vial-gripping mechanism
- Sensors in the vial-gripper mechanism detect that a sample vial has been grasped
- Sensors in the injector turret detect that the sample vial has been transferred to the injector
- Sensors to detect the presence of Enhanced Sample Handling Syringe Carriage
- Sensors to detect the injection port location for easy movement between front and rear inlet ports
- Illuminated syringe for easy viewing
- User-changeable syringe carriage
- Self-aligning injector and tray
- Available solvent-saving mode extends solvent capacity by up to eightfold

¹From cool on-column analysis of C10-C42; meets or exceeds ASTM 2887

²Chromatographic conditions for C10-C16

1 µL injection (5 µL syringe)

10 injections

1 sample wash; 6 sample pumps

Inlet: Split 100:1 (He); 250 °C; 3 mL/min (constant flow)

Column: HP-5MS-30 m x 320 µm x 0.500 µm df

Oven: 100°C (1 min); 30 °C/min to 250°C

Detector: FID

³Chromatographic conditions for C14-16

1 µL injection (5µL syringe)

10 injections for each volume; injection volumes from 10 to 50%

2 sample washes; 6 sample pumps

3 solvent A and B washes post-injection

Inlet: Split 25:1 (He); 250 °C; 3.2 mL/min (constant flow)

Column: HP-5MS-30 m x 320 µm df

Oven: 100 °C (1 min); 30 °C/min to 250 °C

Detector: FID

⁴Determined by residual analyte area measured in subsequent solvent blank (4 solvent A and 4 solvent B post-washes).

Sample Injection

The 7693A injector provides a wide range of injection capabilities to provide maximum flexibility:

| Injection parameter Control | Parameter Range |
|--------------------------------|----------------------------|
| Variable sampling depth | -2 to +30 mm above default |
| Pre-and post-injection syringe | 0-15 prewashes |

| | |
|---------------------------|---|
| Viscosity delay | 0-7 seconds |
| Preinjection sample pumps | 0-15 pumps |
| Minimum sample injection | 10 nL (with 1 μ L syringe) |
| Maximum sample injection | 50 μ L (with 100 μ L syringe in standard tower) 250 μ L (with 500 μ L syringe and Enhanced Sample Handling Syringe Carriage) |
| Injector plunger speed | Fast/slow/variable |
| On-column injection mode | Automatic |
| Multiple injection mode | 1-99 injections of specified volume |
| Injection delay time | 0-1 minute (within multiple injection mode) |
| Preinjection dwell time | 0-1 minute |
| Post-injection dwell time | 0-1 minute |
| Solvent saver | Set at 10, 20, 30, 40, and 80% of syringe volume |
| Injection range | 1 to 50% of syringe volume in increments of 1% |
| Syringe size | 1, 2, 5, 25, 50, 100 μ L maximum volume with optional Enhanced Sample Handling Syringe Carriage |

Sample Management

Vial Handling

- System supports neckless (shell) vials, standard 2 mL vials, and micro vial inserts
- 16 samples with injection tower and standalone turret
- 150 samples with injection tower and tray
- Sampler tray positioned away from GC to minimize exposure to heat
- Tray samples stored in 3 removable 5 x 10 racks
- Racks are compatible with multi-tip pipettes

Solvent

- 4 mL solvent vials
- 2 x 4 mL for injector tower with transfer turret (usable solvent capacity of 20 mL)
- 10 x 4 mL for injector tower with transfer turret (usable solvent capacity of 20 mL)

Syringe support

- Up to 100 μ L with standard syringe carriage
- 250/500 μ L with optional Enhanced Sample Handling Syringe Carriage
- Supports compatible liquid and gastight syringes

Sample Sequencing

- Advanced sequencing with random access using Agilent software
- Simple sequencing using the 7890/6890 Series GC keyboard
- Next sample overlap (Not available on 6850)
- Capability to run priority samples

Heater/Chiller Module

- User installable
- Heats or cools all 150 vials in the tray (temperature range 5-60°C)
- Built-in sensor monitors average coolant temperature in plate
- Uses aluminum vial racks to hold samples
- Requires customer-supplied thermal bath recirculator

Heater/Mixer/Bar Code Reader

- Single vial heating prior to injection (temperature range 35-80°C)
- Single vial mixing prior to injection
- Heating time and mixing time are fully programmable
- Bidirectional mixing up to 4,000 RPM
- Entire module is integrated into 150-position sample tray

Method Programming

The 7693 A system, equipment with two towers, a tray, a heater/mixer/bar code reader, and Enhanced Sample Handling Syringe Carriage can perform liquid manipulation including:

- Solvent addition
- Standard addition
- Internal standard addition
- Dilution
- Derivatization
- Quenching

Physical Specifications

Nominal Weights and Dimensions:

| Weight | |
|---|--------|
| 7693A injector | 3.9 kg |
| 7693A tray without options or accessories | 6.8 kg |
| 7693A tray with heater/mixer/bar code reader | 7.1 kg |
| 7693A tray with heater/chiller | 9.0 kg |
| 7693A tray with heater/mixer/bar code reader and heater/chiller | 9.3 kg |
| Controller box for 6890A | 5 kg |

| Height | |
|---|-------|
| Above bench surface of top of 7693A injector as mounted on 7890 | 94 cm |
| Above bench surface of bottom of 7693A tray as mounted on 7890 | 43 cm |
| Above bench surface of top of 7693A tray as mounted on 7890 | 73 cm |
| Of controller box for 6890A | 11 cm |

| Width | |
|--|-------|
| Extension of 7693A tray past left side of 7890 | 45 cm |
| Width of controller box for 6890A | 25 cm |

| Depth | |
|---|-------|
| Of 7693A tray with/without options, front to back | 42 cm |

| | |
|--|-------|
| Extension of 7693A tray past front of 7890 | 2 cm |
| Of 6890A controller | 31 cm |

Technical and Environmental

- Indoor use only in ordinary atmospheres
- Altitude up to 4,300 m
- Ambient operating temperature 15 to 35°C
- Ambient operating humidity 5 to 95%
- Mains supply voltage fluctuations up to $\pm 10\%$ of the nominal voltage
- Pollution degree 2, Installation Cat II
- 7693A, ALS Controller, is rated for mains connection to 100-120 VAC or 220-240 VAC, 50/60 Hz, 180 VA

Safety and Support

- Injector will not operate if not mounted on GC
- Error indicators show the source operating failure
- Flash memory allows product firmware enhancements to be uploaded via PC
- Onsite repair is available for the 7693A injector and tray system
- In the event of any instrument failures, Agilent's industry-leading Express Exchange service can minimize downtime by shipping replacement sampler modules within hours
- Contact sales representative to verify compatibility with software
*not available in all countries

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