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

Agilent Technologies

Chromatographic Performance

- Sample discrimination ≤ 10%[1]
- Better than 0.3% RSD area reproducibility[2]
- Less than 5% RSD in response factor variation[3]
- Less than 1 part in 100,000 carryover[4]

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 100 ms
- Support of 250- and 500-µL 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

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

[2]Chromatographic 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 × 320 µm × 0.250 µm df
Oven: 180 °C isothermal
Detector: FID

[3]Chromatographic conditions for C14–C16
10 µL 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 × 320 µm × 0.500 µm df
Oven: 100 °C (1 min); 30 °C/min to 250 °C
Detector: FID

[4]Determined 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 rinses for each of solvent A and B rinsing
Sample prewashes	0–15 prewashes
Viscosity delay	0–7 seconds
Preinjection sample pumps	0–15 pumps
Minimum sample injection	10 nL (with 1 µL syringe)
Maximum sample injection	50 µL (with 100 µL syringe in standard tower) 250 µL (with 500 µL syringe and Enhanced Sample Handling Syringe Carriage)
Injection 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, 10, 25, 50, and 100 µL maximum volume with standard syringe carriage 250 and 500 µL 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 × 4 mL for injector tower with standalone turret (usable solvent capacity of 4 mL)
- 10 × 4 mL for injector tower with transfer turret (usable solvent capacity of 20 mL)

Syringe Support

- Up to 100 µL with standard syringe carriage
- 250/500 µL 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 7693A system, equipped 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 ± 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

For More Information

For more information on our products and services, visit our Web site at www.agilent.com/chem.

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Printed in the USA
May 21, 2013
5990-3526EN

Agilent Technologies