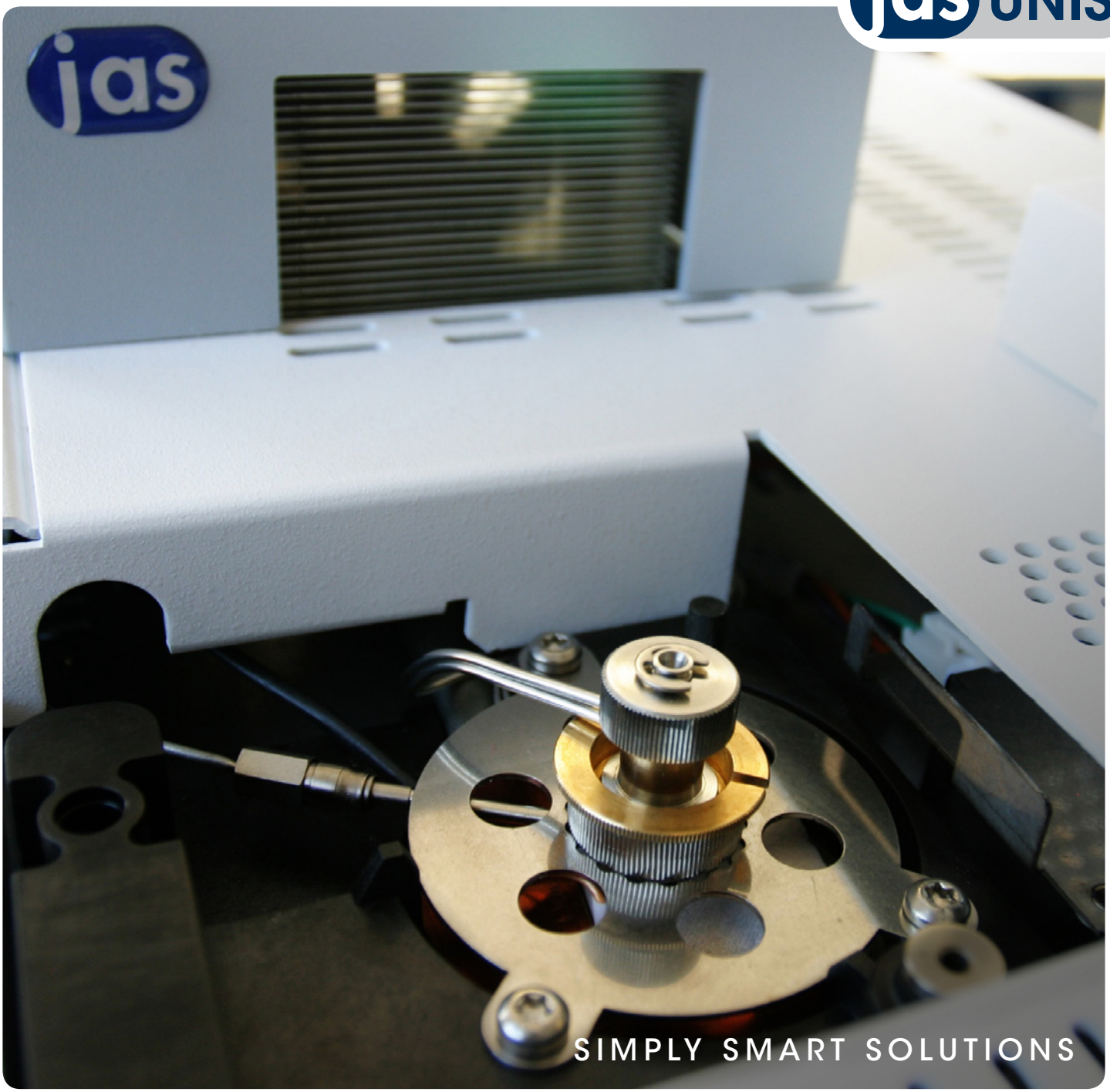
UNIS

UNiversal Injection System

jas UNIS



UNIS

A Versatile Injection System

Temperature Programmable, Split/Splitless and Large Volume Injection Capabilities Using one System

The **JAS UNIS** UNiversal Injection System is a unique all-in-one inlet system which incorporates the latest developments in injector technologies. It allows the end-user to benefit several injection techniques in only one system:

- Split/Splitless (S/SL)
- Programmable Temperature Vaporization (PTV)
- High Temperature PTV (HT PTV)
- Large Volume Injection (LVI)/Solvent Vent (SV)
- Cool-on-Column (CoC)
- Packed Column Injection
- Volatile Organic Compound (VOC) Interface
- Headspace-CryoTrap (HCT) Interface
- Manual Thermal Desorption (TD) Interface
- etc.

This flexible and powerful inlet system enhances the possibilities for sample characterisation with your GC.

Compatibility

The **JAS UNIS** is designed to properly fit and to be easily installed into the 7890/6890 and 6850 GC models from Agilent Technologies.

The UNIS can be used with:

GC 7890 / 6890

GC 6850

Autoinjector (ALS)
7683 / 7693

Headspace Sampler
7694 / G1888x

Additionally, JAS offers various third party sample preparation and injection systems.

Control

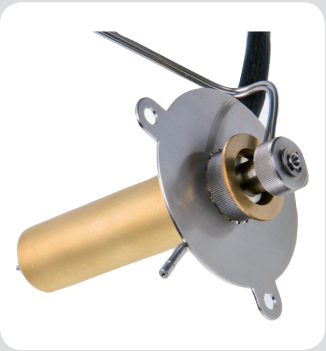
Each UNIS includes a special programmable UNIS-EPC (Electronic Pressure Control) to enable full control via Agilent ChemStation software or GC keypad. The JAS inlet can be controlled like any standard Agilent injector without additional software or external controller.

The UNIS Family

UNIS 500 (S/SL), 2100 (PTV), and 3100 (HT)

The **JAS UNIS** family consists of three different models, **UNIS 500, UNIS 2100, and UNIS 3100**. Together they provide all injection modes for modern gas chromatography.

UNIS 500 - S/SL



The UNIS basic model for isothermal vaporization with a maximum temperature of 450°C. It can be used for Split, Splitless as well as Pulsed Split, Pulsed Splitless injection. Upgrading to UNIS 2100 is possible.

All UNIS models include an Agilent Electronic Pressure Control (EPC) for high reproducibility. A standard EPC with a pressure up to 100 Psi or optional a high pressure version of up to 150 Psi is available.

UNIS 2100 - PTV

The UNIS 2100 is designed for programmable temperature vaporization (PTV). Due to its special heating device, temperature ramps from 1-720°C with 1°C increments are possible. The PTV injector is controlled via Agilent ChemStation and GC keypad.

The UNIS 2100 allows comprehensive PTV as well as S/SL injection modes. It supports Solvent Vent/Large Volume injection and other sample inlet techniques.

This PTV inlet has an extended range of different cooling options: Pressurized Air, LCO_2, LN_2 and Peltier Element. This gives the end-user excellent PTV capabilities down to the cryo temperature range.

The Peltier cooling element is a cost effective alternative to common cooling options as no coolant is required.

UNIS 3100 - HT

Heated transfer to column prevents low mass compound refocusing

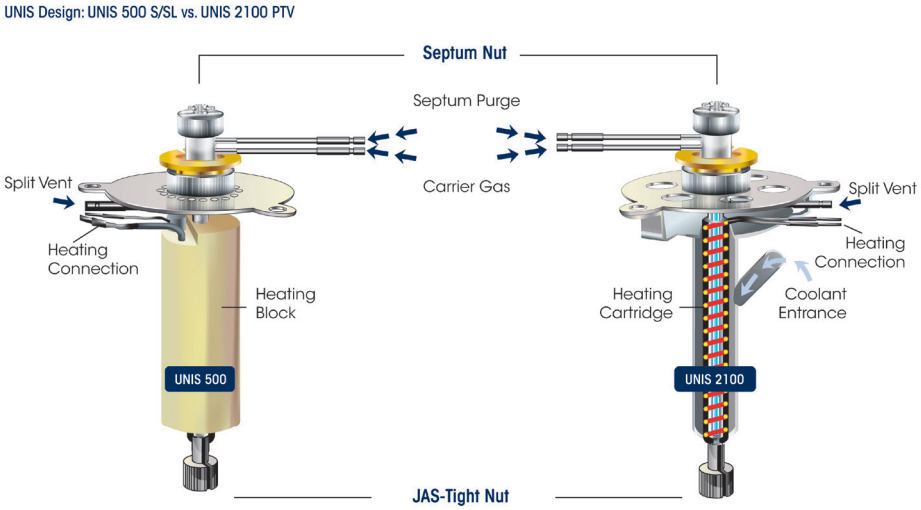
This UNIS inlet is designed for special high temperature applications like SimDis up to C100 or bromine pesticides analysis. The special design with its low thermal mass is based on the UNIS 2100 and can reach a maximum temperature of 500°C. The UNIS 3100 provides both S/SL and PTV modes.

All UNIS liner fit into all three UNIS inlets. Liner exchange and column installation can be done easily and quickly without any tools.

The UNIS Inlet Design

Injector Design

According to their specific fields of application, the UNIS 500 and UNIS 2100 are designed differently as shown in the figure. For stable isothermal operation the UNIS 500 has a heated brass block whereas the UNIS 2100 integrates a coiled wire hollow cartridge to provide rapid temperature ramps. Additionally, the injector body is equipped with a supply pipe used as coolant entrance.



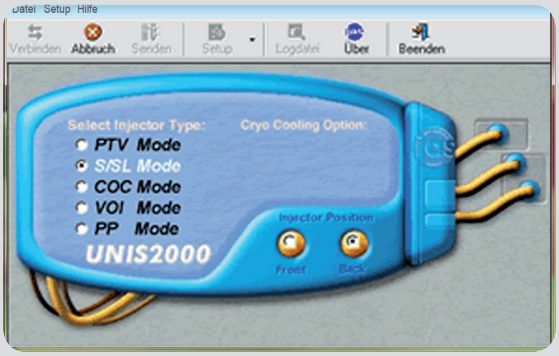
On page 7 you will find an animation of the UNIS 2100.

UNIS Configurator (6890 GC only). For 7890 GCs the EPC comes pre-configured

With the UNIS Configurator the UNIS 2100 inlet can be programmed for different cooling options and injection techniques. Five different injection modes and four different cooling options are available.

Injection modes:

- S/SL Mode
- PTV Mode
- PP Mode
- CoC Mode
- VOI Mode



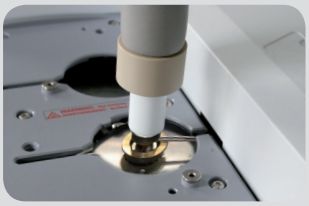
Cooling options:

- Liquid Nitrogen (min. temp. - 160°C)
- Liquid Carbon Dioxide (min. temp. - 65°C)
- Pressurized Air (min. temp. + 10°C above oven temperature)
- Peltier Element (min. temp. + 20°C at oven temperature of + 50°C)

Changing from S/SL to PTV is done entirely through the software, without any changes to the inlet hardware. The total procedure takes only a few seconds. Switching to another mode, such as cool-on-column, is done by exchanging the injector body and entering the CoC parameters in the UNIS Configurator. After automatic GC reboot, the new injection mode is ready for operation.

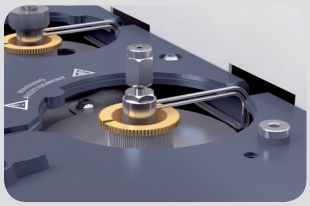
The UNIS Flexibility

UNIS Adaptions



For the UNIS standard connection with septum head, kits are available for connecting to all current headspace samplers. The picture shows the connection of an Agilent 7694 headspace sampler in combination with a UNIS 2100 and an Agilent 6890 GC.

With the manual **TDS Interface** for the UNIS 2100 JAS offers a cost efficient alternative to conventional thermal desorption systems. The filled TDS tubes are directly desorbed in the UNIS injector body. Combined with the **JAS CryoTrap**, the complete system can be easily integrated into a GC without using much space. The smart gas tight elbow latch provides quick exchange of the TDS tubes.



The UNIS **VOC Interface** is very suitable for volatile organic compounds, due to the septumless design. External sample systems, such as TDS or pyrolysis, can be connected fixed and gas tight via the integrated 1/16" connection.

JAS provides the Frontier pyrolysis system with its broad functionality that is also applicable for high temp TD.

UNICAP™ & Accessories

UNICAP™ (**UNI**versal **C**olumn **A**daption **P**rogram) enables the end-user to exchange columns simply within seconds. By using slotted knurled nuts, combined with the **ProCap™** (**Pro**tective **Cap**sulated) ferrules, these procedures can be done manually, without special tools.

Additionally, **UNICAP™** contains several connection pieces, e.g. cross pieces, detector and injector adapters, 1:1-connectors and effluent splitters.

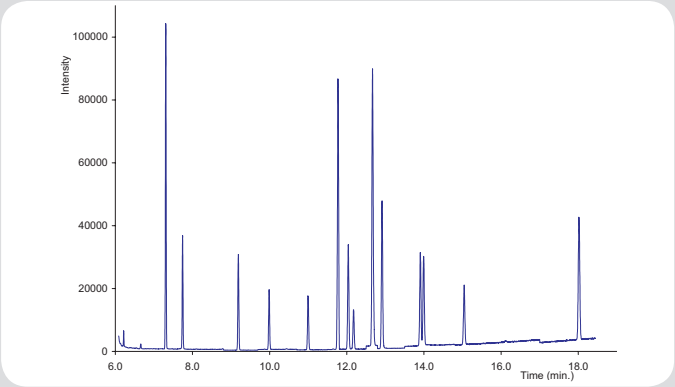
For column-to-column connections the use of **T-Cap™** (**T**ubular-**Cap**sulated) ferrules is recommended.

There are different two-column-interfaces at disposal. You can connect two columns both to an (Agilent) inlet and to an MSD 597x transferline.

Please do not hesitate to request your copy of the UNIS consumables catalog for the full overview of standard and special liners, ferrules, septa, tools, etc.

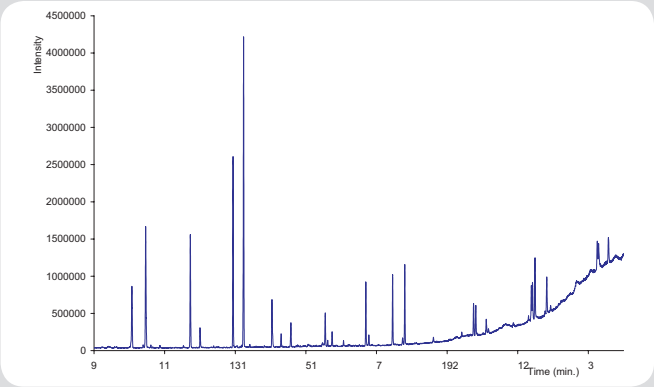
Applications

Pesticides



Chromatogram of a 1µl splitless injection using a UNIS 500, individual components in ppb-range.

PAHs



Chromatogram of a 50 µl solvent vent injection using a UNIS 2100, individual components in lower ppm-range.

Please request your personal copy of the JAS application note for PAHs (No. 02-7820-173).

UNIS Features

Four special features characterize the **JAS UNIS** and make it a perfect tool for daily routine and R&D analyses.

Flexibility

Using the UNIS Configurator software you can move from one injection technique to another, for example from Split/Splitless to PTV within seconds (6890 GC only). For the 7890 GC the UNIS comes preconfigured. A simple change of the injector body enables you to switch from cool-on-column to packed inlet mode. Additionally, four different cooling options provide full flexibility to meet your needs.

Efficiency

Perfectly fitted and optimized injector bodies provide excellent performance for all injection techniques (upgrades for existing systems can be ordered separately).

Ease of Use

The UNIS 500, 2100, and UNIS 3100 are controlled either by the GC keypad or the Agilent ChemStation software, just like any other Agilent Technologies inlet. Changing the liner is simple and does not require any tools. Using UNICAP™, columns can be exchanged manually within seconds, also without any tools.

Economics

The UNIS 2100 is very cost efficient as it can be used for Large Volume Injection without external cooling due to the Peltier Element cooling option. The Peltier Element can cool the UNIS as low as 20°C at an oven temperature of 50°C. It is an economical solution since expensive coolants are not required.

Specifications - Overview

UNIS 500, 2100, 3100

	UNIS 500 - S/SL	UNIS 2100 - PTV	UNIS 3100 - HT
Compatibility			
GC 7890	yes	yes	yes
GC 6890/6850	yes	yes	yes
ALS 7683/7693	yes	yes	yes
HSS 7694/G1888x	yes	yes	yes
ChemStation	yes	yes	yes
EzChrom	yes	yes	yes
Third party software	yes*	yes*	yes*
Max. Temperature			
for 6890/6850	400/375°C	450°C	500°C
for 7890	400°C	450°C	500°C
Heating	block	coil	coil
Isothermal	yes	yes	yes
PTV	no	yes	yes
Temperature Ramp			
for 6890/6850	no	3 max.	3 max.
for 7890	no	20	20
Max. Ramp	N/A	720°C per minute	720°C per minute
Cooling Options			
Pressurized Air	no	+ 10°C above oven temp.	no
CO_2 (liq)	no	- 65°C	no
N_2 (liq)	no	- 160°C	no
Peltier Element	no	+ 20°C (at GC oven +50°C)	no
Pressure Control	UNIS-EPC back pressure front pressure (SL Mode)	UNIS-EPC back pressure front pressure (SL Mode)	UNIS-EPC back pressure front pressure (SL Mode)
Liner Volume (see consumables catalog for details)	up to ~800 µl	up to ~800 µl	up to ~800 µl
Septa			
Standard	yes	yes	yes
Merlin Microseal™	yes	yes	yes
CoC	no	yes (6890 GC only)	no
Column Connection	UNICAP™	UNICAP™	UNICAP™

*Please confirm with your JAS sales rep.

UNIS Compatibility Matrix

UNIS Sample Injection Techniques

	Split / Pulsed Split	Splitless / Pulsed Splitless	PTV	Solvent Vent / Large Volume Injection	Packed Column	VOC Interface	HSS-CryoTrap Interface	TDS Interface	CoC
	UNIS 500 (S/SL)								
	UNIS 3100 (HT)								
	UNIS 2100 (PTV)								
6890	x	x	x	x	x	x	x	x	x
6850	x	x	x	x	x	x	x	x	x
7890	x	x	x	x	N/A	x	x	x	N/A

Retrofits of all three UNIS models for Agilent Technologies 6890 and 6850 GCs are possible!

JAS UNIS 2100 Animation

Please click on the below figure to run the product animation.
To enlarge, please zoom the PDF. (requires minimum Acrobat Reader 9)

JAS sample introduction specials

With the UNIS inlet system and the JAS valve solutions, we are able to offer you optimized products for reproducible liquid and/or gas sample introduction.

In presence of corrosive substances, the UNIS inlets, the valves and their respective tubings can be offered with Hastelloy® C (HC) or Siltek® coatings.

About joint analytical systems

Since 1995 JAS has been a Premier Solution Partner and Value Added Reseller of Agilent Technologies. We are an innovative-driven organization that offers customized solutions for GC, GCxGC, µGC, GC-AED, GC-MS, GC-QQQ, LC, LC-MS, LC-QQQ and Q-TOF LC-MS applications.

JAS serves key industries such as

- Chemical
- Environmental
- Food and Flavor
- Forensic
- Clinical
- Petrochemical
- HPI

JAS Products for GC

- Atomic Emission Detector
- CryoTrap
- Customized Valving System
- EzPrep - Preparative Fraction Collector
- Olfactometer
- UNIS Inlets

joint analytical systems GmbH

Carl-Zeiss-Str. 49
47445 Moers
Germany

Phone: +49 2841 9871 100
Fax: +49 2841 9871 222
e-Mail: info@jas.de
Internet: www.jas.de