

# UNIS

UNiversal Injection System

**jas** UNIS



SIMPLY SMART SOLUTIONS



# 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)
- 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 8890/7890 and 8860 GC models from Agilent Technologies.

The UNIS can be used with:

GC 8890 / 7890



GC 8860



AutoSampler (ALS)



Headspace Sampler



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 software or GC keypad. The JAS inlet can be controlled like any standard Agilent inlet 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 400°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 up to 720°C per minute with 1°C increments are possible. The PTV inlet is controlled via Agilent Software 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<sub>2</sub>, LN<sub>2</sub> and Peltier Element or externe Inlet Cooling.** 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

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.



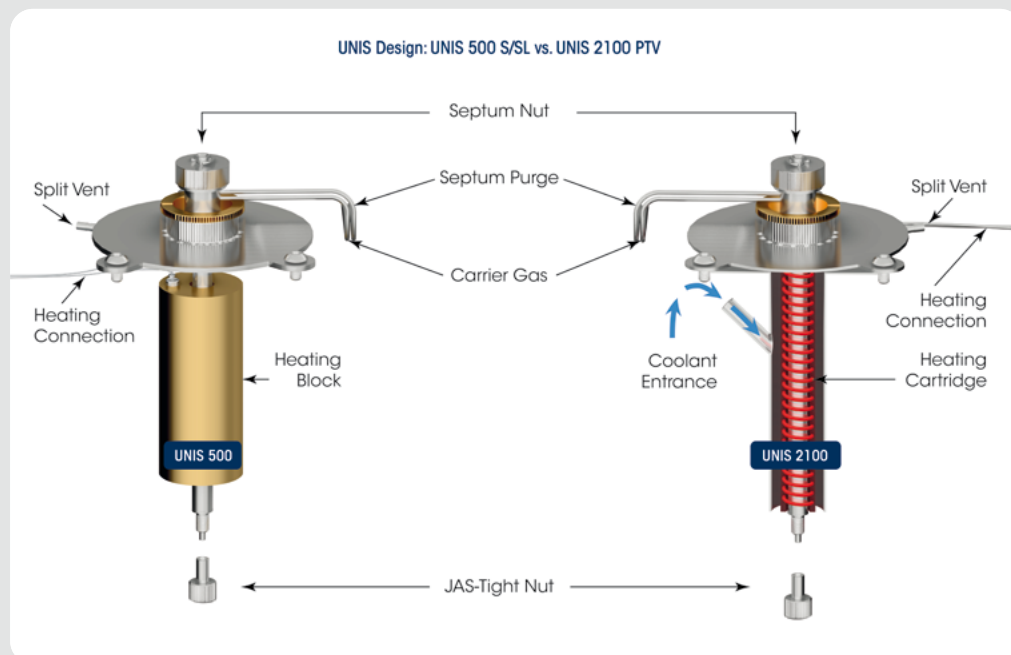
Heated transfer to column prevents low mass compound refocusing

# 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.



## UNIS Features

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

<b>Flexibility</b>	Using the UNIS Inlets Family you can move from one injection technique to another, for example from Split/Splitless to PTV within seconds. For the 8890/7890 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.
<b>Efficiency</b>	Perfectly fitted and optimized injector bodies provide excellent performance for all injection techniques (upgrades for existing systems can be ordered separately).
<b>Ease of Use</b>	The UNIS 500, 2100, and UNIS 3100 are controlled either by the GC keypad or the Agilent OpenLAB 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.
<b>Economics</b>	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.

# The UNIS Flexibility

## UNICAP™ & Accessories

**UNICAP™** (**U**niversal **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™** (**P**rotective **C**apsulated) 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-**C**apsulated) 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.

## Liners

All UNIS liners fit into all three UNIS inlets. Liner exchange can be done easily and quickly without any additional parts.



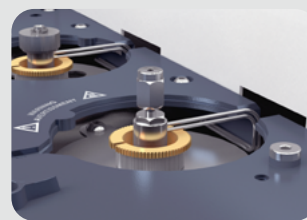
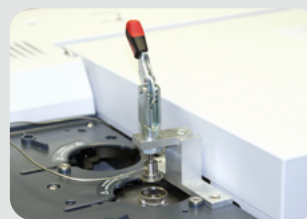
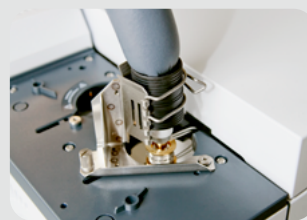
## UNIS Adaptions

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 8890 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 Pyrolyser Systems with broad functionality that is also applicable for high temperature TD.



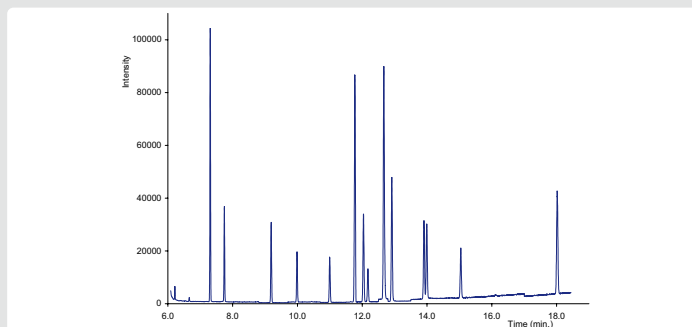
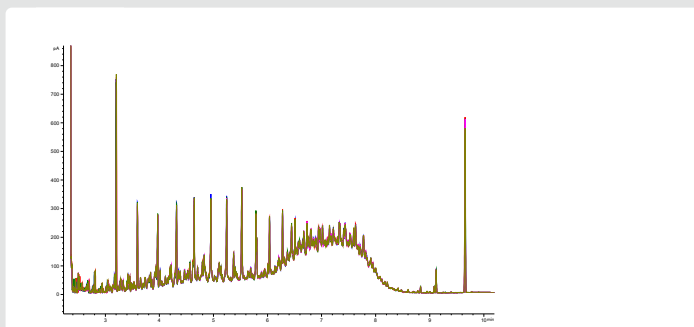
**Please do not hesitate to request your copy of the UNIS consumables catalog for the full overview of standard and special liners, ferrules, septa, tools, etc.**



# Applications

## Pesticides

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



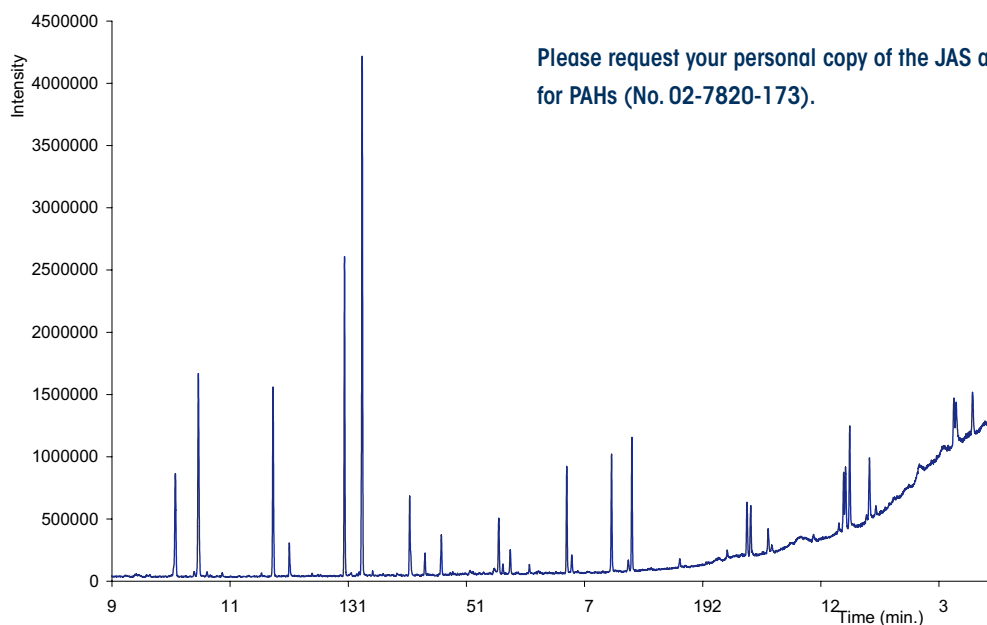
RSD results from seven runs in LVI mode:

- Überlagerung von 7 Injektionen
- 50 µL Injektion im Solvent Vent Modus
- c (Kohlenwasserstoffe) = 27.6 ng/µL
- c (C10 = C40) = 6.0 ng/µL
- RSD (KW) = 0.45
- 

RSD [%] N = 7	RT	Surface	Amount
C10	0.102	3.101	3.101
KW	0.014	0.45	0.449
C40	0.015	0.286	0.286

## 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).

# Specifications - Overview

UNIS 500, 2100, 3100

	UNIS 500 - S/SL	UNIS 2100 - PTV	UNIS 3100 - HT
<b>Compatibility</b>			
GC 8890/7890	yes	yes	yes
GC 8860	yes	no	no
ALS 7683/7693	yes	yes	yes
HSS Systems	yes	yes	yes
Open Lab	yes	yes	yes
EzChrom/ChemStation	yes	yes	yes
Third party software	yes*	yes*	yes*
<b>Max. Temperature</b>			
for 8890/7890	400/375°C	450°C	500°C
for 8860	400°C		
<b>Heating</b>			
Isothermal	yes	yes	yes
PTV	no	yes	yes
<b>Temperature Ramp</b>			
for 8890	no	10 Ramps. mit 900 °C/min	10 Ramps mit 900 °C/min
for 7890	no	10 Ramps mit 720 °C/min	10 Ramps mit 720°C/min
for 8860	no	no	no
<b>Cooling Options</b>			
Pressurized Air	no	+ 10°C above oven temp.	no
CO <sub>2</sub> (liq)	no	- 65°C	no
N <sub>2</sub> (liq)	no	- 160°C	no
Peltier Element	no	+ 20°C (at GC oven +50°C)	no
<b>Pressure Control</b>			
	UNIS-EPC	UNIS-EPC	UNIS-EPC
	back pressure	back pressure	back pressure
	front pressure (SL Mode)	front pressure (SL Mode)	front pressure (SL Mode)
<b>Liner Volume</b>			
(see consumables catalog for details)	up to ~800 µl	up to ~800 µl	up to ~800 µl
<b>Septa</b>			
Standard	yes	yes	yes
Merlin Microseal™	yes	yes	yes
CoC	no	yes (6890 GC only)	no
<b>Column Connection</b>			
	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)									
8890	x	x	x	x	x	x	x	x	N/A
8860	x	x	N/A	N/A	-	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.



## 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,  $\mu$ GC, GC-AED, GC-MS, GC-QQQ, LC, LC-MS, LC-QQQ and Q-TOF LC-MS applications.

## JAS serves key industries such as

- Chemical
- Petrochemical/HPI
- Environmental
- Food & Flavor
- Forensic

## JAS Products for GC

- Atomic Emission Detector
- UNIS Inlet Systems
- Automatic Gas Samplers
- CryoTrap
- Customized Valving Systems
- EzPrep - Preparative Fraction Collector
- Olfactometer
- GICU - Gas Injection Control Unit

### Joint Analytical Systems GmbH

Carl-Zeiss-Straße 49  
47445 Moers  
Germany

Phone: +49 2841 9871 100  
Fax: +49 2841 9871 222  
e-Mail: [info@jas.de](mailto:info@jas.de)  
Internet: [www.jas.de](http://www.jas.de)

Copyright © 2020

Joint Analytical Systems GmbH

All rights reserved