

GERSTEL
certified **SUPPLIES**



**Cooled
Injection
System, CIS**



**Automated
Liner
EXchange, ALEX**



GERSTEL® Cooled Injection System, CIS

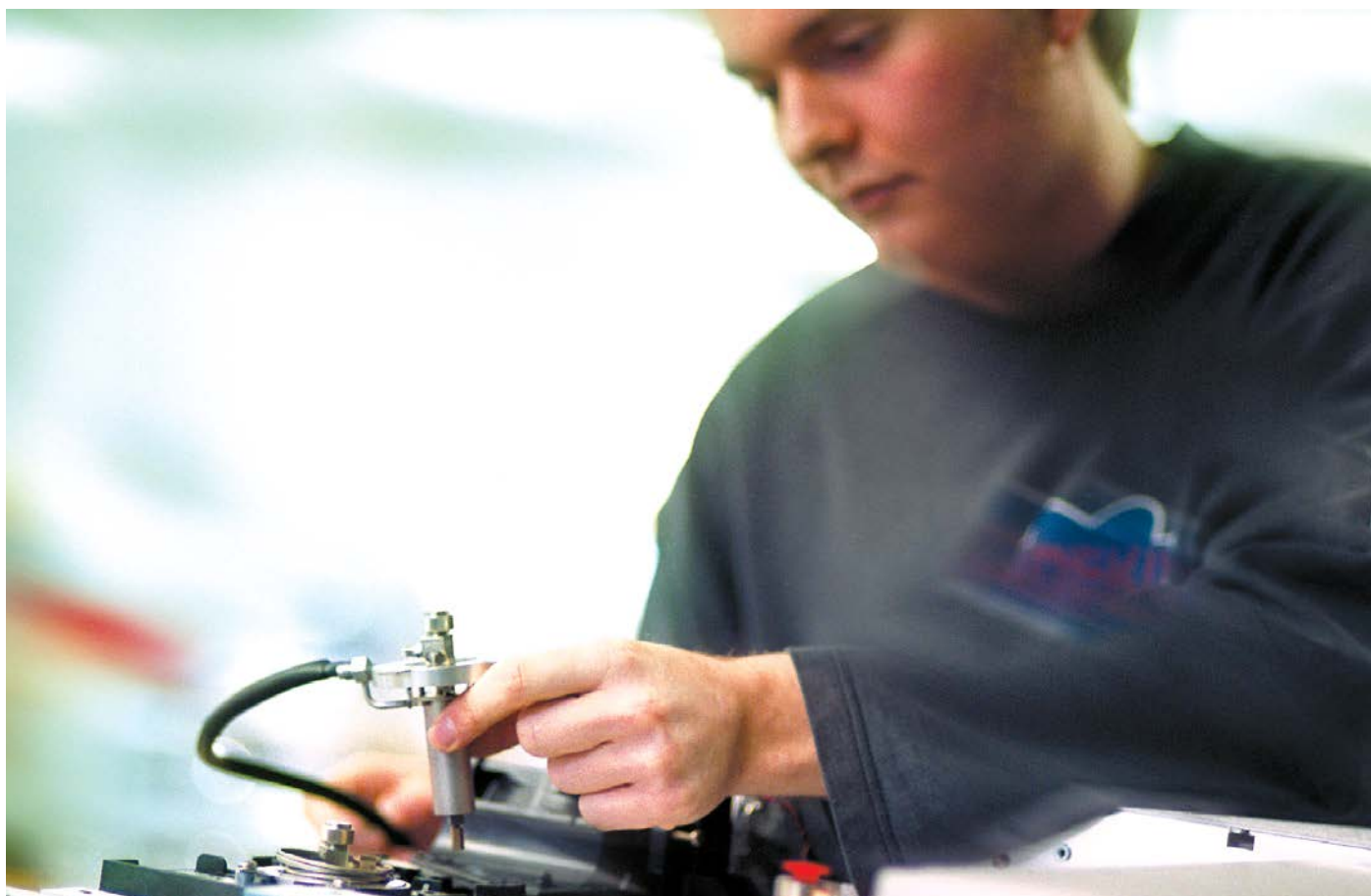
Universal inlet for gas chromatography

The GERSTEL CIS is a temperature programmable PTV-type GC inlet. The CIS offers septumless, cold injection of volumes of up to 1000 µl for liquid samples. The integrated split function enables the CIS to handle ultra-trace concentrations as well as undiluted samples. Programmed linear heating ensures quantitative, discrimination-free transfer of sample components to the GC column for best possible GC analysis results.

The CIS is a general purpose, universal GC inlet. When working with Thermal Desorption or Headspace techniques, the CIS is used for enrichment, focusing and quantitative transfer of analytes to the capillary column.

An integral part of the CIS is the GERSTEL MAS controller, which can be used to control all GERSTEL modules, thus ensuring easy, cost effective system upgrades. The CIS can be retro-fitted to existing Agilent Technologies/ HP gas chromatographs.

GERSTEL GRAPHPACK® technology and septumless sampling head are standard features. A choice of liquid CO₂, liquid N₂ or Peltier cooling is available. Available CIS models cover the temperature range from -180 to +650 °C. Compounds covering a wide boiling range can be efficiently trapped with subsequent discrimination-free analyte transfer to the capillary column. The CIS is compatible with all GERSTEL autosamplers - and with autosamplers from all major manufacturers.



Part No.

**Septumless sampling head (SLH)
for CIS 3/4/6**

(for 23 gauge needles)

For manual or automated sample introduction

CIS 3	003089-064-00
CIS 4/6	007513-064-00



Service kit for SLH

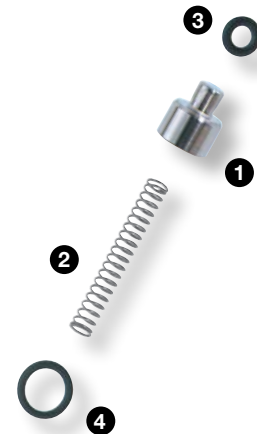
Complete

009999-010-00

Contains one unit each of the following items:

1 Plunger	004230-000-00
2 Spring	009999-014-00
3 Inner-O-Ring (Kalrez™)	009999-015-00
4 Outer-O-Ring (Viton™) *	009999-016-00

* When reordering only complete original package size is available (5 units).



SLH cap

23 gauge needles

006144-064-00



Teflon™ needle guide for SLH

1 package (10 units)

23 gauge needles

003091-064-00

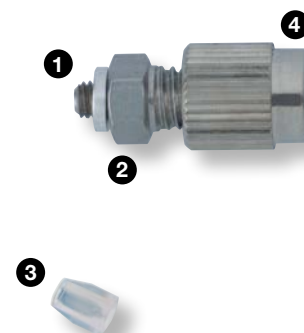


**Carrier gas connection
for SLH**

Complete kit

005610-000-00

1 Aluminium seal for SLH 1 package (5 units)	004256-005-00
2 Carrier gas connection body for SLH 1 package (1 units)	001459-003-00
3 Teflon ferrule 1/16" 1 package (10 units)	001576-010-00
4 Knurled nut 1 package (5 units)	001117-005-00



Part No.

The glass liners listed below are designed for the CIS 3 or CIS 4/6 and Agilent PTV respectively. Unless otherwise specified, the dimensions are:

CIS 4/6 & Agilent PTV OD 3 mm (ID 2 mm); length 71 mm.
CIS 3 OD 2 mm (ID 1.5 mm); length 93 mm.

Note:

With exception of the Siltek™ coated liners, the deactivation is only stable at temperatures up to 275 °C. Higher temperatures can be used, but this will create more active sites inside the liner.

GERSTEL Headspace:

For static headspace analysis we recommend a deactivated baffled liner. For splitless injection it may be necessary to refocus inside the liner. In this case liners filled with Tenax TA™, Carbotrap B™ or PDMS foam may be appropriate.

CIS glass liners



straight with notch
deactivated

For initial system evaluation. Recommended for splitless injection. Can be used for custom-packed liners.
 Maximum temperature: 275 °C

1 package (10 units)

CIS 3	011708-010-00
CIS 4/6 & Agilent PTV	011709-010-00



baffled
deactivated

For cold split injections, baffles create good mixing of sample and carrier gas. For liquid injections of moderate/high boilers and for labile compounds.
 Maximum temperature: 275 °C

1 package (10 units)

CIS 3	011710-010-00
CIS 4/6 & Agilent PTV	011711-010-00



for SPME ID 1 mm
deactivated

For SPME desorption. Due to the smaller inner diameter, the linear carrier gas velocity is increased, resulting in more efficient desorption. (For manual SPME or automated SPME using the GERSTEL MultiPurpose Sampler MPS)

Maximum temperature: 275 °C

1 package (10 units)

CIS 4/6 & Agilent PTV	011712-010-00
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Part No.

Siltek™ coated baffled liners

deactivated

For cold split injections, baffles create good mixing of sample and carrier gas. The Siltek™ coating withstands high temperatures up to 350 °C. It is also suitable for labile compounds.

1 package (5 units)

CIS 3 014758-005-00

CIS 4/6 & Agilent PTV 014652-005-00



CIS glass liners packed

with silanized glass wool

deactivated

Suitable for large volume injections into the CIS. The large surface area helps retain analytes while solvent evaporates. Furthermore, the packing acts as a filter for particulates. For liquid injections of moderate/high boilers, stable compounds.

Maximum temperature: 275 °C

1 package (10 units)

CIS 3 010849-010-00

CIS 4/6 & Agilent PTV 010850-010-00



with quartz wool

deactivated

Suitable for large volume injections into the CIS. The large surface area helps retain analytes while solvent evaporates. Furthermore the packing can act as a filter for particulates. More inert than glass wool. For liquid injections of difficult compounds (acidic, alkaline etc.).

Maximum temperature: 275 °C

1 package (10 units)

CIS 3 008420-010-00

CIS 4/6 & Agilent PTV 007519-010-00



with glass beads

deactivated

Suitable for large volume injections into the CIS. Usage similar to the glass wool liner, but the glass beads provide a larger surface area and better retention of low boilers. The packing can also act as a filter for particulates.

Maximum temperature: 275 °C

1 package (5 units)

CIS 4/6 & Agilent PTV 011714-005-00



Part No.

CIS glass liners packed

with Tenax TA™

For PTV injection combined with solvent venting during large volume injections. Low affinity to methanol and water (Best water elimination at 40 °C). Usable for trapping from C5 to C26. Particularly suitable for headspace analysis.

Maximum temperature: 350 °C

1 package (5 units)

CIS 3 **013249-005-00**

CIS 4/6 & Agilent PTV **013247-005-00**

with Carbotrap B™

For trapping of very volatile compounds in combination with large volume injections or headspace analysis.

Maximum temperature: 400 °C

1 package (5 units)

CIS 3 **013250-005-00**

CIS 4/6 & Agilent PTV **013248-005-00**

with glass beads and Carbotrap C™

For trapping of analytes over a wide boiling point range in combination with large volume injections or headspace analysis.

Maximum temperature: 400 °C

1 package (5 units)

CIS 4/6 & Agilent PTV **011716-005-00**

with PDMS foam

For trapping of non polar analytes covering a wide range of volatility up to n-C40. Well suited for large volume injections.

Maximum temperature: 300 °C

Minimum temperature: -10 °C (glass transition temperature)

5 mm packing length for semi volatiles

1 package (10 units)

CIS 4/6 & Agilent PTV **014594-010-00**

10 mm packing length for intermediate volatiles

1 package (10 units)

CIS 4/6 & Agilent PTV **014595-010-00**

30 mm packing length retains very volatile analytes

1 package (5 units)

CIS 4/6 & Agilent PTV **014596-005-00**



Part No.

CIS glass liner kits

CIS glass liner kit

containing 2 of each of the following liner types:

- straight with notch, deactivated
- Baffled, deactivated
- Packed with silanized glass wool, deactivated
- Packed with Tenax™
- Packed with Carbotrap B™

CIS 3 013543-003-00

CIS 4/6 & Agilent PTV 013543-004-00

CIS PDMS glass liner kit

containing 2 of each of the following liner types:

- Packed with PDMS foam, 5 mm packing length
- Packed with PDMS foam, 10 mm packing length
- Packed with PDMS foam, 30 mm packing length

CIS 4/6 & Agilent PTV 014601-104-00

CIS glass liners packed

with silanized glass wool

Suitable for large volume injections into the PTV. The large surface area helps retain analytes while solvent evaporates. Furthermore the packing can act as a filter for particulates. For liquid injections of moderate/high boilers, stable compounds.

Note:

- Glass body is not deactivated.
- 1 package (10 units)

CIS 3 002931-010-00

CIS 4/6 & Agilent PTV 014284-010-00

Adsorbent properties

Tenax TA™

Tenax TA™ is a porous material based on 2,6-diphenylene oxide polymer, with a specific surface area of 35 m²/g. The material has a low affinity for water and methanol and can be used to trap and thermally desorb compounds in the C5-C26 range. The particle size is 60/80 MESH.

Carbotrap B™

Carbotrap B™ has a mesh size of 20/40 mesh, with a specific surface area of 100 m²/g. This adsorbent is especially suited for trapping and thermally desorbing compounds in the range from C5 to C20 (depending on the structure of the molecule).

Carbotrap C™

Carbopack C™ has a mesh size of 20/40 mesh with a specific surface area of 10 m²/g. This adsorbent is especially suited for trapping and

thermally desorbing compounds in the range from C9 to C30 (depending on the structure of the molecule).

PDMS

The GERSTEL Polydimethylsiloxane (PDMS) foam has an open porous structure. It is suitable as a trap or "guard column". The highly inert and non polar material is well suited for large volume injections with analytes covering a wide range of volatility. PDMS provides strong retention of non polar analytes. Can be used for analytes as high boiling as n-C40. Ideal packing if glass wool trapping is too weak and Tenax TA™ too strong. Allows trapping at moderate temperatures, reducing the need for cryogenic cooling compared to glass wool. Maximum temperature: 300 °C. Minimum temperature -10 °C (glass transition temperature).



Part No.

CIS glass liners



straight with notch

not deactivated

For an initial system evaluation. Recommended for splitless injection. Can be used for custom-packed liners.

Maximum temperature: 400 °C

Note:

Liner is not deactivated. Unstable compounds may decompose.

1 package (10 units)

CIS 3 **013886-010-00**

CIS 4/6 & Agilent PTV **013881-010-00**

1 package (100 units)

CIS 3 **013886-100-00**

CIS 4/6 & Agilent PTV **013881-100-00**



straight without notch

ID 2 mm, not deactivated

For special uses e.g. in combination with TDS. Enables analyte trapping on the column (For more information contact your local GERSTEL representative).

Maximum temperature: 400 °C

Note:

liner is not deactivated. Unstable compounds may decompose.

1 package (10 units)

CIS 4/6 & Agilent PTV **013910-010-00**



baffled

not deactivated

For cold split injections, baffles create good mixing of sample and carrier gas. For liquid injections of stable and unproblematic moderate/high boilers.

Maximum temperature: 400 °C

Note:

liner is not deactivated. Unstable compounds may decompose. (Primary use in combination with the Automated Liner Exchange (ALEX) system)

1 package (10 units)

CIS 3 **013887-010-00**

CIS 4/6 & Agilent PTV **013882-010-00**

1 package (100 units)

CIS 3 **013887-100-00**

CIS 4/6 & Agilent PTV **013882-100-00**

Part No.

Quartz liners for CIS 4/6 & Agilent PTV

straight with notch

not deactivated

For an initial system evaluation. Recommended for splitless injection. Can be used for custom-packed liners.

Suitable for high temperature usage (up to 650 °C) with a CIS 6.

1 unit	013238-000-00
1 package (5 units)	013238-005-00



packed with quartz wool

not deactivated

Suitable for large volume injections into the PTV. The large surface area helps retain analytes while solvent evaporates. Furthermore the packing can act as a filter for particulates. More inert than glass wool. For liquid injections of difficult compounds (acidic, alkaline etc.). Suitable for high temperature usage (up to 650 °C) with a CIS 6.

1 unit	013605-000-00
1 package (5 units)	013605-005-00



baffled

not deactivated

For cold split injections, baffles create good mixing of sample and carrier gas. For liquid injections of moderate/high boilers and for labile compounds. Suitable for high temperature usage (up to 650 °C) with a CIS 6.

1 unit	013148-000-00
1 package (5 units)	013148-005-00



Part No.



GRAPHPACK® 3D ferrules for glass liners

1 package (5 units)

CIS 3	002426-005-00
CIS 4/6; Agilent PTV	007541-005-00

1 package (10 units)

CIS 3	002426-010-00
CIS 4/6; Agilent PTV	007541-010-00

GRAPHPACK® 3D Kalrez ferrules for glass liners

(not for use in conjunction with TDS / TDU)

1 package (2 units)

CIS 4/6; Agilent PTV	011868-002-00
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GRAPHPACK 3D mounting tool for glass liners



CIS 3	003079-000-00
CIS 4/6 & Agilent PTV	007542-000-00

Septum head

without septum purge



CIS 3	002835-000-00
CIS 4/6 & Agilent PTV	007514-000-00

Septum head

with septum purge



CIS 3	008577-000-00
CIS 4/6 & Agilent PTV	008584-000-00

Spare parts



1 Septum cap	006460-000-00
2 Septum for CIS 3/4, white Silicone; 1 package (25 units)	008246-025-00
3 Teflon ferrule 1/16"; 1 package (10 units)	001576-010-00
4 Knurled nut; 1 package (5 units)	001117-005-00

Column OD / ID **Part No.**

GRAPHPACK® 2M adapter for CIS

CIS 3/4 (silver)	0.31 mm / 0.20 mm	007259-031-00
	0.45 mm / 0.32 mm	007259-045-00
	0.70 mm / 0.53 mm	007259-007-00
CIS 6 (Stainless steel)	0.31 mm / 0.20 mm	013244-031-00
	0.45 mm / 0.32 mm	013244-045-00
	0.70 mm / 0.53 mm	013244-007-00

Spare parts

Silver seal; 1 package (5 units)	002841-005-00
GRAPHPACK nut; 1 package (5 units)	001268-005-00



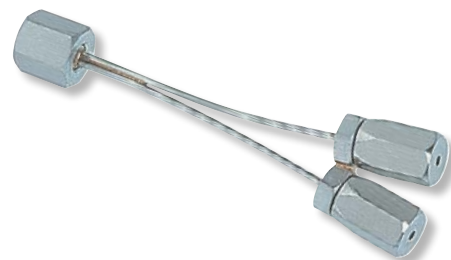
GRAPHPACK® 2M dual column injector adapter

For the simultaneous connection of two capillary columns to a single CIS inlet.

0.31 mm / 0.20 mm	007530-031-00
0.45 mm / 0.32 mm	007530-045-00

Spare parts

Silver seal; 1 package (5 units)	002841-005-00
GRAPHPACK nut; 1 package (5 units)	003714-005-00



GRAPHPACK 2M ferrules

1 package (10 units)

0.20 mm / ≤ 0.1 mm	001805-020-00
0.25 mm / ≤ 0.1 mm	001805-025-00
0.31 mm / 0.20 mm	001805-031-00
0.40 mm / 0.25 mm	001805-040-00
0.45 mm / 0.32 mm	001805-045-00
0.70 mm / 0.53 mm	001805-007-00
0.80 mm / 0.27 mm	001805-008-00



Part No.



On Column kit

On-Column insert converts CIS into On-Column injector.

1 On Column insert; single

CIS 3 005533-000-00

CIS 4/6 008340-000-00

2 GRAPHPACK 3D ferrule; 1 package (5 units)

CIS 3 005532-000-00

CIS 4/6 007541-005-00

3 GRAPHPACK 2M adapter

CIS 3/4 007259-007-00

CIS 6 013244-007-00

4 GRAPHPACK 2M ferrule; 1 package (10 units)

001805-007-00

5 Silver seal; 1 package (5 units)

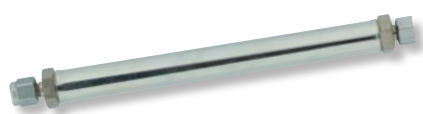
002841-005-00

6 Teflon needle guide (0.47 mm); 1 package (10 units)

003091-047-00

7 Cap for SLH (0.47 mm)

006144-047-00



Adsorption trap

for split outlet
1/16" inlet, 1/16" outlet connection,
filled with charcoal

005243-001-00



Cryo tube

2 m

CIS 4/6 006124-004-00

with CIS adapter

Microliter syringes

injection / sampler	system	description	µL	units	Part No.
manual injection	CIS	needle-in-needle	1	1	009999-041-00
Autosampler HP 7673 / Agilent 7683/7693	CIS	fixed needle	5	1	009980-028-00
			5	6	009980-029-00
			10	1	009980-030-00
			10	6	009980-031-00
Autosampler HP 7673 / Agilent 7683/7693	CIS	replaceable needle	25	1	009980-032-00
			50	1	009970-013-00
			100	1	009970-014-00
					Spare needle
Autosampler HP 7673 / Agilent 7683/7693	CIS	fixed needle, on-column-injection	10	1	009999-052-00

injection type	system	description	µL	units	Part No.
manual injection	CIS	fixed needle	5	1	009970-021-00
			10	1	009970-024-00
			25	1	009970-010-00
			50	1	009970-011-00
			100	1	009970-012-00
manual injection	CIS	gastight	100	1	009999-019-00
			250	1	009999-018-00
			500	1	009999-017-00
			1000	1	009999-021-00
					Spare TLL needle



GERSTEL® Automated Liner EXchange, ALEX

For routine GC analysis of samples that contain large amounts of solid material. Designed for use with the GERSTEL Multi-Purpose Sampler, MPS 2 and the GERSTEL Cooled Injection System, CIS. GC inlet liners can be replaced automatically at user-defined intervals in the sequence. A special ALEX liner tray holds up to 98 prepared liners, enabling routine analysis of large numbers of dirty samples.



Part No.

Universal syringe holder

Version 2; compatible with ALEX

1 unit	013822-000-00
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ALEX transport adapter

for CIS 4/6 Liner

1 unit	013795-000-00
10 units	013795-010-00



O-ring kit for ALEX transport adapter

1 package (5 × 4 units)

1 package (5 × 4 units)	013934-005-00
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Part No.

Septa

for GERSTEL-ALEX transport adapter

10 units	015608-010-00
100 units	015608-100-00



Allen wrench

for transport adapter screws, 4 mm

1 unit	009999-204-00
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O-ring

for ALEX sampling head,
1 package (10 units)

10 units	013931-010-00
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Glass inserts for ALEX sample tray

10 units	013794-010-00
100 units	013794-100-00



O-ring for ALEX sample tray glass inserts

10 units	014292-010-00
100 units	014292-100-00





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