SOLITAX®sc TURBIDITY & SUSPENDED SOLIDS SENSORS

Applications

- Drinking Water
- Wastewater
- Beverage
- Industrial Water
- Power

PROGNOSYS™ READY

Accurate, color-independent suspended solids and turbidity measurements.

Greater Accuracy, Less Maintenance

Hach Solitax sc sensors provide accurate, color-independent measurement of turbidity and suspended solids in drinking water, wastewater and industrial process applications. A self-cleaning device prevents biological growth and interference of gas bubbles. This system's reliable performance and full data communication capability help improve process control and reduce treatment costs associated with polymer use, digester volume, and sludge handling.

Excellent Correlation to Laboratory Analysis

Solitax sc sensors show an exceptional correlation to laboratory analysis. On-line measurement not only saves time on manual analysis, but also provides critical real-time measurements that can be used to operate the plant more efficiently.

Fully Serviceable Sensors

Conventional turbidity and suspended solids sensors are potted and are discarded when they no longer function. Solitax sc sensors are fully serviceable, which often doubles the useful life of the sensor.

Easy One-point Calibration

Factory calibrated in conformity with DIN EN ISO 7027 for long-term calibration stability. Calibration is easy with a simple correction factor procedure.

Multi-channel, Multi-parameter System

Any two Solitax sc sensors can be installed on one Hach SC200 Controller. The same controller can also accommodate any combination of parameters. All of Hach's model sc sensors are "plug and play" with no complicated wiring or set-up procedure necessary.

HACH®
Be Right™

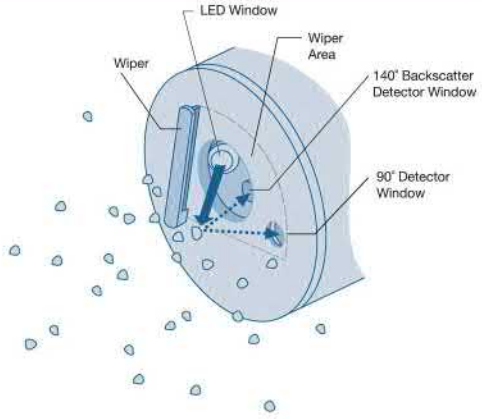
Specifications*

	For insertion in pipes		For immersion in open tanks		
Model	INSERTION inline sc	INSERTION highline sc	IMMERSION t-line sc	IMMERSION ts-line sc	IMMERSION hs-line sc
Parameter	Suspended Solids, Turbidity	Hight Range Suspended Solids, Turbidity	Turbidity	Suspended Solids, Turbidity	Hight Range Suspended Solids, Turbidity
Measuring Range Turbidity	0.001 to 4000 NTU	0.001 to 4000 NTU	0.001 to 4000 NTU	0.001 to 4000 NTU	0.001 to 4000 NTU
Measuring Range TSS-Content	0.001 mg/L to 50 g/L	0.001 mg/L to 500 g/L		0.001 mg/L to 50 g/L	0.001 mg/L to 500 g/L
Unit	Turbidity: User selectable—NTU, FNU, or TE/F Suspended Solids: User selectable—g/L, mg/L, ppm, or % solids				
Accuracy	Turbidity up to 1000 NTU; without calibration < 5% of the measured value ±0.01 NTU; with calibration < 1% of the measured value ±0.01 NTU				
Repeatability	Suspended solids content: < 3 %				
	Turbidity: < 1 %				
Response Time	1 s < T90 < 300 s (adjustable)				
Calibration Method	Turbidity: Formazin or Stablcal Standard (at 800 NTU). Suspended Solids: Sample specific, based on gravimetric TSS analysis with a correction factor procedure.				
Certifications	CE certified to EN 61326-1, EN 61326/A1, EN 61326/A2, EN 61010-1				
Flow	Max. 3 m/s (the presence of air bubbles affects the measurement)				
Operating Temperature Range	0 to 40 °C (32 to 104°F)				
Pressure Limit	Stainless steel: 6 bar or 60 m (87 psi) PVC: 1 bar or 10 m (14.5 psi) Stainless steel: 6 bar or 60 m (87 psi) PVC: 1 bar or 10 m (14.5 psi)				
Material	Optics Carrier and Sleeve: stainless steel 1.4571 or black PVC Wiper Arm: stainless steel 1.4581; Wiper Blade: silicone (standard) Optional: Viton (LZX578); Wiper Shaft: stainless steel 1.4571 Threaded cable fitting: stainless steel 1.4305 or white PVC		Optics Carrier and Sleeve: stainless steel 1.4571 or black PVC Wiper Arm: stainless steel 1.4581; Wiper Blade: silicone (standard) Optional: Viton (LZX578); Wiper Shaft: stainless steel 1.4571 Threaded cable fitting: stainless steel 1.4305 or white PVC	
Weight Sensor	Insertion stainless steel: 2.4 kg (5.29 lb.)		Immersion stainless steel: 1.38 kg (3.0 lb.) Immersion PVC: 0.52 kg (1.2 lb.)		
Cable Length	10 m (optional extension cables available)				
					Subject to change without notice

Principle of Operation

Solitax sc ts-line sensor with dual-beam optics and added backscatter detector

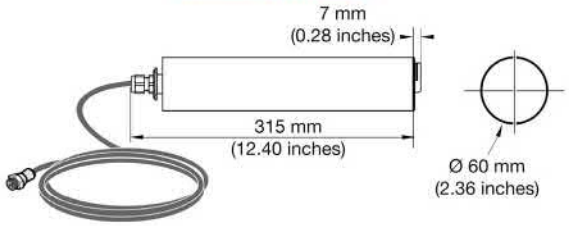
- Dual infrared light beams. LED light source transmits light at 45° to sensor face.
- Nephelometric photoreceptors detect light at 90° to the transmitted light beam.
- Backscatter photoreceptor (included on all models except the Solitax sc t-line) detects light at 140° to the transmitted light beam to measure suspended solids in heavily loaded sample streams.
- Self-cleaning wiper, optional.
- T-line probes measure turbidity only. TS, HS, inline, and highline sensors measure either turbidity or suspended solids.



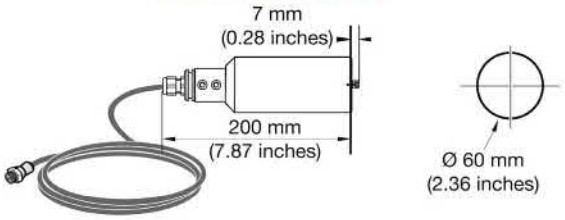
Dimensions

Hach Solitax sc sensors can be fixed to the rim of the tank for immersion applications or inserted directly through the sidewall of a pipeline for insertion applications. A variety of installation kits are available.

Solitax sc Insertion Probe

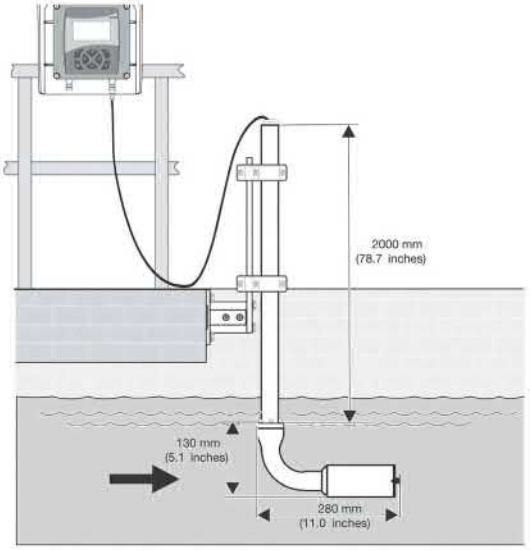


Solitax sc Immersion Probe

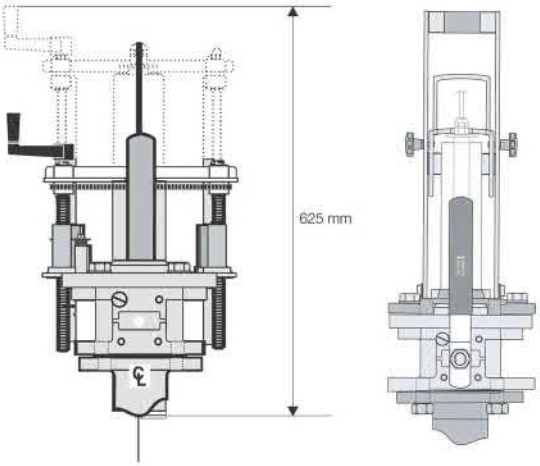


Installation / Mounting

Installation for mounting Solitax sc for immersion in open tanks. (Stainless steel pole mount kit, Prod. No. LZY714.99.53120)



Fixture with ball valve for mounting Solitax sc models inline and highline sensors in pipes., minimum pipe size 100 mm (4-in.) (Prod. No. LZX337, max pressure 6 bar; Prod. No. 936, max. pressure 1 bar.



Ordering Information

Common Configurations: Solitax sc Turbidity and Suspended Solids Analyzers with SC200 controller and sensors shown

Immersion in Open Tanks Applications

2983400	Turbidity Analyzer, t-line sc, PVC, with wiper (0.001 to 4000 NTU)
2983500	Turbidity and Suspended Solids Analyzer, ts-line sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
2983600	Turbidity and High Range Suspended Solids Analyzer, hs-line sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)

Insertion in Pipes Applications (includes insertion mounting kit)

2983700	Turbidity and Suspended Solids Analyzer, inline sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
2983900	Turbidity and High Range Suspended Solids Analyzer, highline sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)

NOTE:
1. *Power cords must be ordered separately.*
2. *Fixed point installation kit or handrail mount kit must be ordered separately for all immersion analyzers.*

Individual Solitax sc Sensors

Immersion Sensors

LXV423.99.10000	Turbidity, t-line sc, PVC with wiper (0.001 to 4000 NTU)
LXV423.99.12000	Turbidity, t-line sc, PVC without wiper (0.001 to 4000 NTU)
LXV423.99.10100	Turbidity and Suspended Solids, ts-line sc, PVC with wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
LXV423.99.12100	Turbidity and Suspended Solids, ts-line sc, PVC without wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
LXV423.99.00100	Turbidity and Suspended Solids, ts-line sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
LXV423.99.02100	Turbidity and Suspended Solids, ts-line sc, stainless steel without wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
LXV423.99.10200	Turbidity and Suspended Solids, hs-line sc, PVC with wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)
LXV423.99.12200	Turbidity and Suspended Solids, hs-line sc, PVC without wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)
LXV423.99.00200	Turbidity and Suspended Solids, hs-line sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)
LXV423.99.02200	Turbidity and Suspended Solids, hs-line sc, stainless steel without wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)

Insertion Sensors

LXV424.99.00100	Turbidity and Suspended Solids, inline sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
LXV424.99.02100	Turbidity and Suspended Solids, inline sc, stainless steel without wiper (0.001 to 4000 NTU, 0.001 mg/L to 50 g/L)
LXV424.99.00200	Turbidity and Suspended Solids, highline sc, stainless steel with wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)
LXV424.99.02200	Turbidity and Suspended Solids, highline sc, stainless steel without wiper (0.001 to 4000 NTU, 0.001 mg/L to 500 g/L)

Installation Accessories

LZY714.99.53120	Stainless Steel pole mount kit for Solitax t-line, ts-line, and hs-line immersion sensors, including 10 cm base and 2 m pole with sensor adapter
5738400	Insertion Mounting Kit for inline and highline insertion sensors (ball valve safety armature and extraction system). Kit includes a 4 inch pre-coped Carbon Steel Flange. Non-coped flanges are available
AHA033NPT	Sensor Adapter, straight 1-1/2 FNPT
AHA034NPT	Sensor Adapter, elbow 1-1/2 FNPT 90°
MH236B00Z	Handrail Mounting Kit (for sensor to be used with either adapter above) includes 1.5-inch diameter by 7.5-ft long CPVC pipe and swivel/pivot/ pipe clamp assembly
LZX337	Stainless steel ball valve safety armature/ extraction fitting for in-line and hi-line probes w/o welding flange, maximum operating pressure 6 bar/87 psi
LZX936	Stainless steel ball valve armature, maximum operation pressure 1 bar/14.5 psi
LZX660	Non-coped stainless steel welding flange for insertion kit
LZX661	Non-coped carbon steel welding flange for insertion kit

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Be Right™

PRODUCT CATALOG
2020

SRI Instruments Europe GmbH

10 great reasons to choose an SRI GC or data system:

1. SRI instruments are typically HALF the price of comparable units from other manufacturers.
2. SRI instruments come in a rugged, reusable shipping container.
3. Choose from 16 GC detectors, and mount four, five or even six on one GC. No one offers more detector choices!
4. Choose from 12 GC injector types and install up to five on one GC. Perform more analyses on one GC than you thought possible!
5. Thebuilt-in PeakSimplefor Windowschromatography data system connects to your laptop or desktop computer using a USB cable. Software updates are FREE and can be downloaded from our website: www.srigc.com
6. SRI Instruments products come with a two year warranty and free technical support. When you call SRI, you reach a knowledgeable technician immediately, not voice mail.
7. Easy hardware upgrades-SRI can install an additional detector or injector on your existing GC in a matter of days.
8. Customization! SRI offers over 1,000 possible GC configurations-name your application.
9. Rent a GC or a data system if your need is short-term. SRI maintains an extensive selection of GC configurations so you can have what you need when you need it.
10. CE, TUV, GS and NRTL approvals: SRI manufactures all instruments in compliance with EN 61010 standards for laboratory equipment.

SRI Instruments

U.S. MANUFACTURER OF CUST OM GAS CHROMAT OGRAPH SYSTEMS

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53604 Bad Honnef / Deutschland

Terms	
Minimum Order	200€
Currency	Euro/ USD
Repairs	All repairs are performed at the SRI Europe GmbH.
Changes	Product specifications, design and prices may change without notice.

SRI Product Index

Preconfigured GC Overview






We specialize in CUSTOM GAS CHROMATOGRAPHS. However, we have preconfigured a number of GCs for common applications. In some cases, the preconfigured GCs are less expensive than the identical hardware assembled "a la carte." Each of the preconfigured GCs may be further customized (except the educational GCs).

Capillary FID GC System

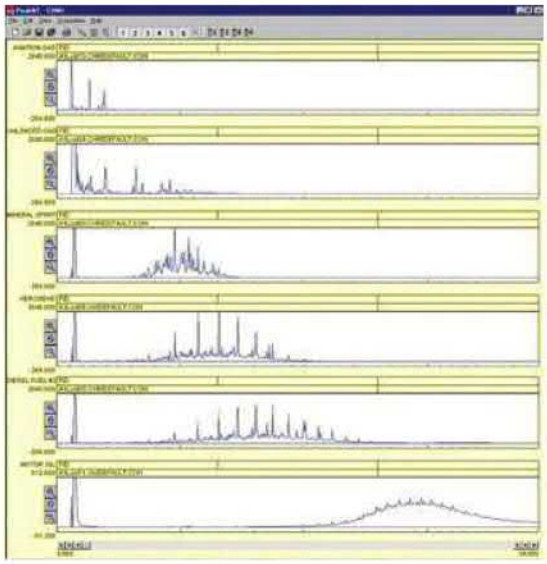
- **FID Detector**
- **30 meter Capilary Column**
- **Built-in, "whisper quiet" Air Compressor**
- **1 Channel PeakSimple Data System**
- **On-Column Injector**

...on the compact 8610C chassis

The Capillary FID GC System is a state of the art, general purpose, temperature programmable GC in a compact, low-cost package. It includes everything you need to separate and detect fuels and other hydrocarbon compounds. In addition to a wide range of general gas chromatography applications, the Capillary FID GC is excellent for both environmental and quality control applications.

The 30 meter capillary column can efficiently separate hydrocarbons up to C_{40}+. The On-column injector for 0.53mm capillary columns is good for liquid and gas samples with high and low boiling analytes—no boiling point discrimination. The built-in, "whisper quiet" air compressor provides a nearly silent supply of combustion air for the FID detector, so an air cylinder is not required for most applications. The optional Split/Splitless injector upgrade allows for the use of 0.32mm, 0.25mm and smaller capillary columns.

These six chromatograms resulted from analyzing various fuels with an SRI Capillary FID GC System. The chromatograms reveal the characteristic hydrocarbon range and fingerprint of each fuel. All six runs were performed under identical conditions.



8610-5400 **Capillary FID GC System**

OPTIONS & UPGRADES: split/splitless injector, PTV injector, additional detectors with 6 channel USB PeakSimple data system, Methanizer, gas sampling valves, additional column(s), autosampler. (VOLTAGE: for 115VAC, use 8610-5405-1; for 230VAC, use 8610-5405-2)

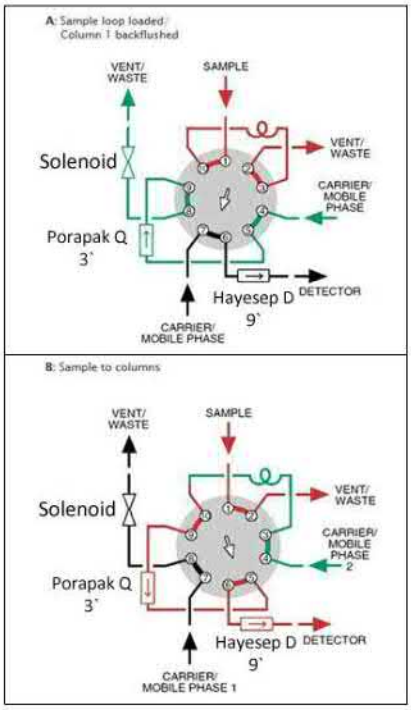
European Greenhouse Gas GC

- ECD and FID-Methanizer Detectors
- Pre and main column for each channel
- Two 10-Port Gas Sampling Valve & Sample Loop
- 6 channel PeakSimple Data System
- On-Column Injector

...on the compact 8610C chassis

The Greenhouse GC is designed for the detection of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Depending upon the volume of the sample loop on the gas sampling valve, it can detect trace levels or high concentrations. It may be used for stack or ambient air monitoring, or in a plane for atmospheric air analysis.

The Greenhouse GC is not limited to CO_2, CH_4 and N_2O. The FID-Methanizer detects hydrocarbons as well as CO and CO_2 (as methane). The sensitive ECD detector responds to electronegative compounds, especially chlorinated, fluorinated or brominated molecules like PCBs and pesticides. With a low-volume sample loop, the Greenhouse GC can be used to measure gases produced by bacterial metabolic processes and life cycles.



8610-0040-EU **European Greenhouse Gas GC**

OPTIONS & UPGRADES: additional sample loops, additional detectors
(VOLTAGE: for 115VAC, use 8610-0040-1; for 230VAC, use 8610-0040-2)

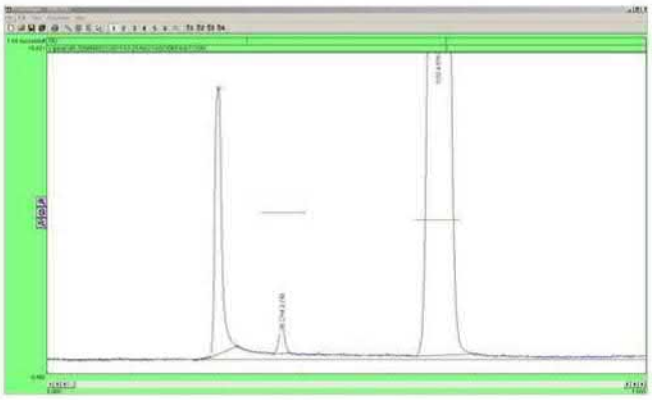
Plumbing European Greenhouse Gas Chromatograph:

Both 10-Port-Valves are working in the same way – plumbing is the same.

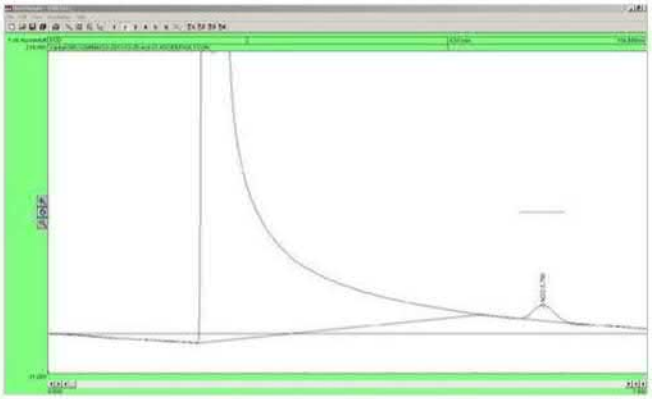
There are two different positions of the 10-Port-Valve - "Load-Position" and "Inject-Position". First draw shows the "Load-Position". In this position the sample will be flushed on both sample loops with one injection by syringe or sampler. The run is started by pressing "Start Run" or a remote start signal from the autosampler. All relays are controlled by software.

After you start to run - both valves rotate to the "Inject-Position" - you can see in the second drawing that now the sample loops are switched into the carrier gas stream. The sample passes through the pre-column and main column. Water is retained by the pre-column longer than CH4, CO2 and N2O. Before the water leaves the pre-column, - both 10-Ports-Valves are switched back to the "Load-Position" (Figure 1) and at same time Relay "A" will open a solenoid valve to backflush the water to vent. Now the flow direction in the pre-column is changed. In this time all the other compounds are on the main columns on the way to the detectors.

1 ml Ambient Air: CH4 and CO2 Detection FID-Methanizer



1ml Ambient Air: N2O Detection ECD



Multiple Gas Analyzer #1 GC System

Separates multiple gases with a single injection

Very tolerant of user adjustments and timing variations

Simpler than other multiple gas capable systems

The basic model includes:

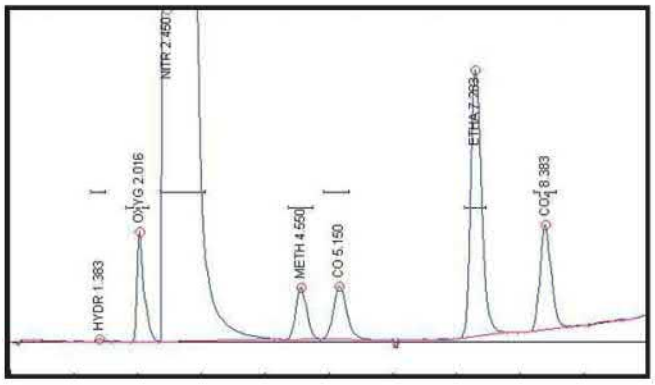
- **TCD Detector**
- **Two Columns - MoleSieve 13X & Silica Gel**
- **10-port Gas Sampling Valve and Loop**
- **1 channel PeakSimple Data System**

...on the compact 8610C chassis

The SRI Multiple Gas Analyzer #1 GC System (MG#1) can separate multiple gases with a single injection. It is pre plumbed and ready to resolve H_2, O_2, N_2, Methane, CO, Ethane, CO_2, Ethylene, NO_X, Acetylene, Propane, Butanes, Pentanes and C_6-C_8. The MG#1 is very tolerant of user adjustments and timing variations because it is simpler than other multi-gas capable systems. Unlike complicated and timing-critical gas analysis configurations with three or four columns and three or four valves, the SRI Multiple Gas Analyzer uses a single 10-port gas sampling valve and two packed columns: a 2 meter Molecular Sieve 13X and a 2 meter Silica Gel.

The basic Multiple Gas Analyzer #1 is equipped with a TCD detector for detection limits in the 200-500ppm range. The second option is a TCD-Methanizer-FID configuration, which provides 5ppm detection limits for CO, CO_2 and all hydrocarbons. The third option is a TCD-HID detector combination for detection limits in the 10ppm range for all analytes.

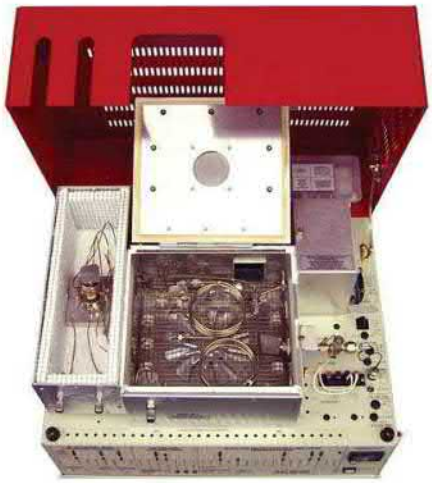
This chromatogram shows the separation of a 1% Gas Mix + 2% ethane sample on a basic TCD equipped MG#1.

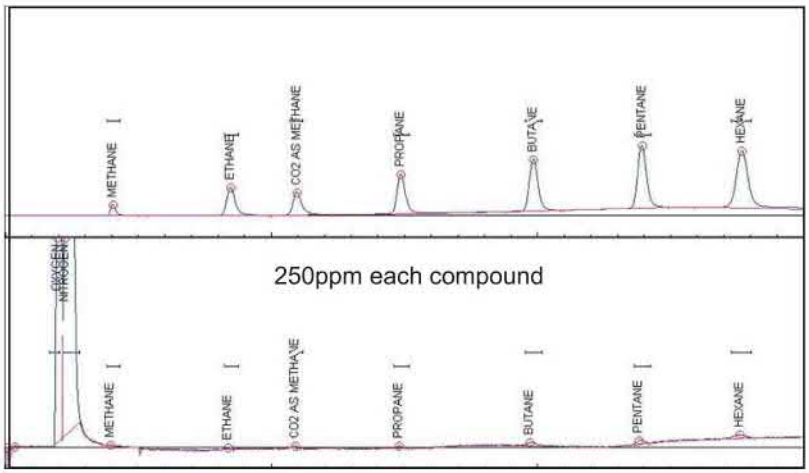


Multiple Gas Analyzer #1 GC System

The basic model includes:

- **TCD Detector**
- **FID-Methanizer**
- **Two Packed Columns**
- **10-port Gas Sampling Valve and Loop**
- **1 or 6 channel PeakSimple Data System**





The FID measures the C_1-C_6 hydrocarbons, plus CO and CO_2, which are converted to methane by the Methanizer in the FID jet.

The TCD measures hydrogen, oxygen, nitrogen, methane and other compounds whose concentrations are at least 200-500ppm.

8610-0070	**Multiple Gas Analyzer #1 with TCD detector and 1 channel PeakSimple data system**
8610-0071	**Multiple Gas Analyzer #1 with TCD, Methanizer, FID, built-in "whisper quiet" air compressor and 6 channel PeakSimple data system**
8610-0072	**Multiple Gas Analyzer #1 with TCD and HID detectors, and 6 channel PeakSimple data system**

OPTIONS & UPGRADES: 6 channel USB PeakSimple data system, additional gas sampling valve, additional detectors
(VOLTAGE: for 115VAC, use "part number-1" [ex: 8610-0070-1] for 230VAC, use "part number-2")

Multiple Gas Analyzer #5 GC System

Separates multiple gases with a single injection

Very tolerant of user adjustments and timing variations

Simpler than other multiple gas capable systems

The basic model includes:

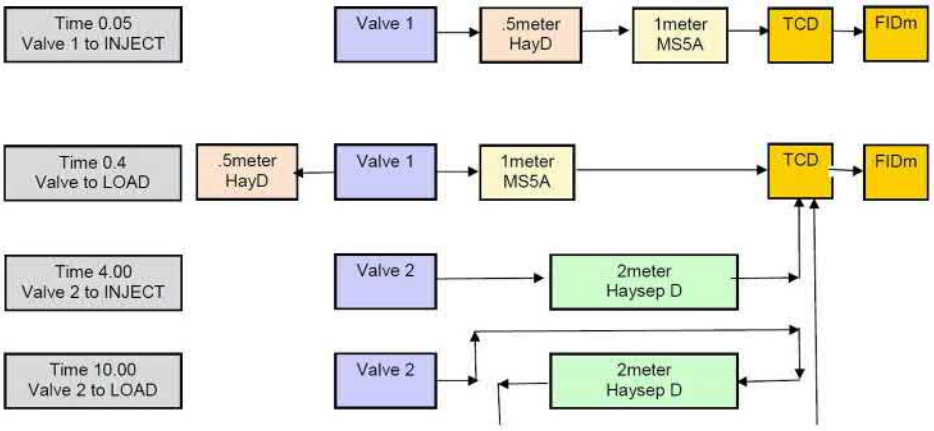
- **TCD Detector**
- **Methanizer, FID, and HID options**
- **Two 10-port Gas Sampling Valves and Loops**
- **3 Columns - MoleSieve 13X & HaySep-D .5 and 2 m**
- **1 or 6 channel PeakSimple Data System**

...on the compact 8610C chassis

Unfortunately there is no single column that can separate: Hydrogen, Oxygen, Nitrogen, Methane, CO, CO2, Ethane, Water, Propane, Butane, and Pentane. Over the years, SRI Instruments has devised several solutions to this analytical problem, starting with the MultipleGas#1 configuration and evolving to the present MultipleGas#5 configuration.

The Thermal Conductivity Detector can detect all the gases listed above, besides hydrogen, from 200ppm to 100% concentration. The Flame Ionization Detector can detect hydrocarbons down to 1ppm, and with the Methanizer attachment, CO and CO2 down to 1ppm.

This model, is highly customizable, as are most of our GCs. It can be modified to have a third valve, more detectors, and more columns.



Multiple Gas Analyzer #5 GC System

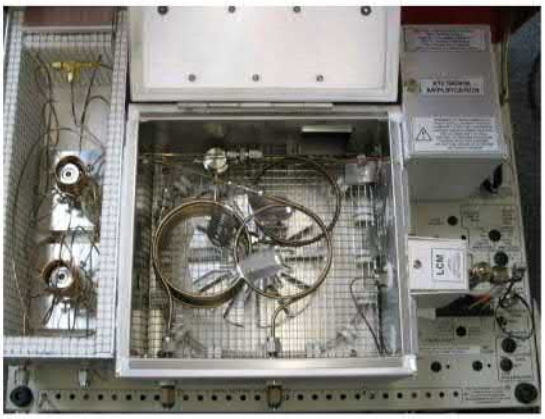
The schematic above shows the 4 steps in the MG5 analysis after the sample has been loaded into the loop of each valve.

STEP 1: Valve1 is turned to the INJECT position (Relay G on). The carrier gas pushes the sample out of the valve loop onto the 5.meter Haysep D column. H2, O2, N2 CH4 and CO migrate through the .5meter HayD column very quickly and land on the 1meter MS5A column.

STEP 2: Valve1 is turned back to the LOAD position (Relay G off). Carrier gas continues to push the H2, O2, N2, CH4 and CO molecules through the MS5A column towards the detectors. Also carrier gas backflushes any remaining molecules backwards through the .5meter HayD column out to vent (not through the detectors). The molecules which remain on the .5meter column are CO2, Water, and C2 and higher hydrocarbons. These molecules would get stuck on the MS5A column if they were allowed onto the MS5A column. However, they easily backflush out of the HayD.

STEP 3: Valve2 is turned to the INJECT position (Relay F on). The carrier gas pushes the molecules in the loop of Valve2 onto the 2meter HayD column in the "forward" direction. H2, O2, N2 and CO elute from the column very quickly as one peak, followed by the CH4 peak, the CO2, water and the hydro- carbons from C2-C6.

STEP 4: At some point in the analysis Valve2 is returned to the LOAD position. This reverses (back- flushes) the flow direction in the HayD column. Any peaks which have not yet exited the HayD column now back out of the column and into the detector. If, for example the analysis had no peaks after CO2 (or you did not care about any peak after CO2), then you would backflush after the CO2 peak. Any peaks remaining in the HayD column would come out in a "lump".



8610-0570	**Multiple Gas Analyzer #2 GC with TCD detector and 1 channel PeakSimple data system**
8610-0571	**Multiple Gas Analyzer #2 GC with TCD, Methanizer, FID, built-in "whisper quiet" air compressor and 6 channel PeakSimple data system**
8610-0572	**Multiple Gas Analyzer #2 GC with TCD and HID detectors, and 6 channel PeakSimple data system**

Multiple Gas Analyzer + Sulfur GC Systems

- **FID Detector**
- **30 meter Capilary Column**
- **Built-in, "whisper quiet" Air Compressor**
- **6 Channel PeakSimple Data System**
- **On-Column Injector**

...on the compact 8610C chassis

Many analysts require natural gas analysis for BTU value calculations or drilling and mudlogging applications. Frequently, sulfur compounds are also of interest.

Because low sulfur concentrations (<50ppm) are difficult to measure, SRI has enhanced our popular Multiple Gas Analyzer GCs to simultaneously monitor low levels of sulfur compounds. The additional hardware required is an FPD/FID detector, which selectively detects sulfur down to mid-ppb range, and a room temperature Silcosteel sample loop.

Room Temperature
Silcosteel sample loop

One reason sulfur is so difficult to measure is that it disappears on contact with hot stainless steel surfaces; even limited contact with a hot stainless steel sample loop will destroy any sulfur in the gas sample. Our solution is to use a Silcosteel-lined transfer line leading to a splitter, and a 60 meter thick film capillary column. While Teflon columns are sometimes also used for sulfur analysis, the natural gas analysis (using MoleSieve and SilicaGel) requires column temperatures of 250°C or higher. Since the sulfur column is located in the same column oven, it is essential to use a column like the 60 meter capillary which can tolerate the higher temperatures.

8610-0073	**Multiple Gas Analyzer #1 + Sulfur GC with TCD, FID, and FPD/FID detectors, methanizer, built-in air compressor, 3 columns, and Silcosteel sample loop**
8610-0373	**Multiple Gas Analyzer #3 + Sulfur GC with TCD, FID-methanizer, and FPD/FID detectors, built-in air compressor, 3 columns, and Silcosteel sample loop**

OPTIONS & UPGRADES: split/splitless and PTV injectors, additional column(s), gas sampling valve, Thermal Desorber
(VOLTAGE: for 115VAC, use "part number-1" [ex: 8610-0073-1] for 230VAC, use "part number-2")

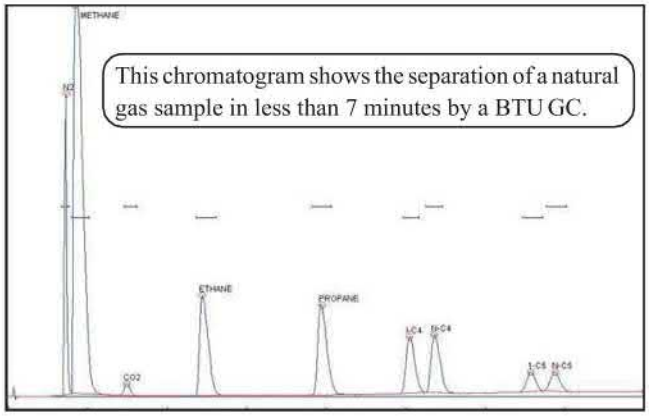
BTU Gas Analyzer GC System

This BTU GC is customized with an FID detector, an additional gas sampling valve, and a built-in 6 channel PeakSimple data system.

- **TCD Detector**
- **10-port Gas Sampling Valve**
- **1 channel PeakSimple Data System**
- **30 meter x 0.53mm MXT-1 Capillary Column**
- **1 meter HayeSep-D Column**

...on the compact 8610C chassis

The BTU Gas Analyzer GC system is preplumbed and ready to measure N2, methane, CO_2, ethane, H_2O, propane, iso- and normal butanes, iso- and normal pentanes and C_6 plus backflush. The main benefits of the SRI BTU Gas Analyzer system are simplicity, low cost and the ability to determine the water content of the gas.



This chromatogram shows the separation of a natural gas sample in less than 7 minutes by a BTU GC.

0The SRI BTU Gas Analyzer uses just a single 10 port gas sampling valve and two columns, and is tolerant of valve timing variations or operator adjustments. Unlike the widely used competitive micro GCs, the SRI BTU Gas Analyzer GC system is not only tolerant of water in the sample gas, but it actually generates a quantifiable water peak. The seven minute analysis may be longer than a micro GC analysis, but the BTU GC does not need baking out between runs. Therefore, about the same number of runs may be made per day with the BTU GC as with a typical micro GC.

The BTU Gas Analyzer can be configured with a TCD detector only, for detection limits in the 200-500ppm range. Other detectors can be added, such as the HID, FID, or FPD for applications requiring higher sensitivity or selectivity.

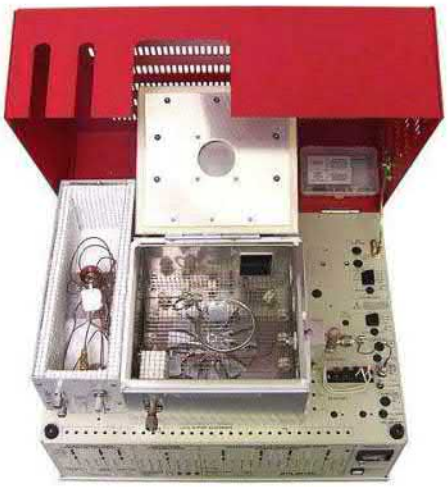
8610-3070 **BTU Gas Analyzer GC System**

OPTIONS & UPGRADES: additional detectors with a 6 channel USB PeakSimple data system, FID, Methanizer, split/splitless and PTV injectors, additional gas sampling valves, additional columns (VOLTAGE: for 115VAC, use 8610-3070-1; for 230VAC, use 8610-3070-2)

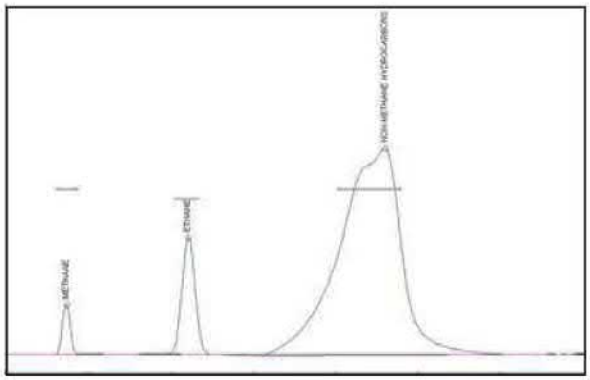
Method 25 Methane/Nonmethane GC System

- **FID Detector**
- **HayeSep-D Column**
- **10-port "Backflush" Gas Sampling Valve**
- **Built-in "whisper quiet" Air Compressor**
- **1 channel PeakSimple Data System**

...on the compact 8610C chassis



The SRI Method 25 GC system is equipped with an FID detector, built-in air compressor and 10-port gas sampling valve to quickly determine methane/nonmethane hydrocarbons as per EPA Method 25.



In this typical methane/nonmethane analysis, the nonmethane hydrocarbons were backflushed after the ethane peak. Depending upon the operator's needs, the valve timing could have been set to backflush after the methane or after the C_3, C_4, C_5 or C_6 hydrocarbons.

The sample is connected to the inlet port on the GC, where it fills the 1mL sample loop on the gas sampling valve. The valve is then automatically rotated to inject the sample onto the column, which separates the methane (and optionally the ethane) away from the rest of the hydrocarbons. After the elution of the compound(s) of interest, the gas sampling valve is automatically returned to the starting position, which backflushes the rest of the hydrocarbons into the detector.

The single channel PeakSimple data system controls the temperature programmable column oven and the gas sampling valve, collects the data, quantitates the nonmethane hydrocarbons and produces a printed report. The system comes standard with a HayeSep-D column, but may be equipped with other column types as desired.

8610-0025 **Method 25 GC System**

OPTIONS & UPGRADES: additional detectors with 6 channel USB PeakSimple data system, Methanizer, split/splitless and PTV injectors, additional gas sampling valves & columns, autosampler. (VOLTAGE: for 115VAC, use 8610-0025-1; for 230VAC, use 8610-0025-2)

Mud-Logging GC System

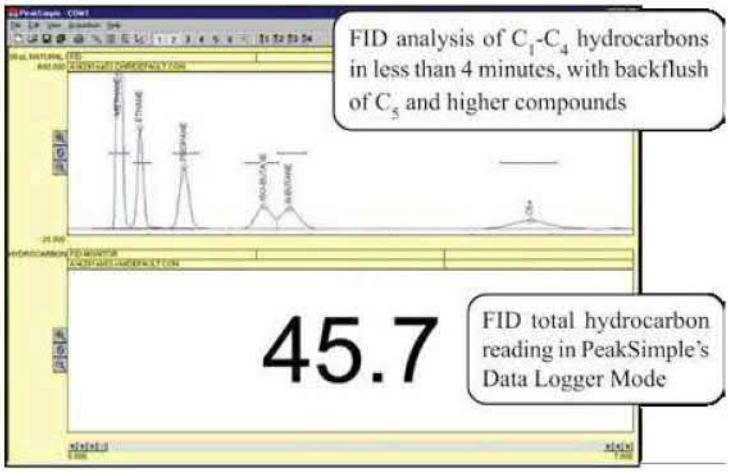
- **Dual FID Detectors**
- **HayeSep-D Column**
- **10-port Gas Sampling Valve**
- **Built-in "whisper quiet" Air Compressor**
- **6 channel PeakSimple Data System**

...on the compact 8610C chassis

The Mud-logging GC system is designed to provide a continuous reading of total hydrocarbons in a gas stream while periodically performing a chromatographic separation of the sample to determine the exact composition of the sample gas stream.

The sample gas stream (at a regulated pressure) is connected to a bulkhead fitting on the GC's heated valve oven where it flows through the loop of the 10 port gas sampling valve, and also to the second FID detector, which continually monitors the total hydrocarbon content of the gas. Automatically, at a repeating time interval controlled by the operator, the gas sampling valve injects the contents of its loop into the GC column, where it is separated into the constituent hydrocarbon peaks and detected by the first FID detector.

The built-in, six channel PeakSimple data system displays both the continuous total hydrocarbon reading and the separated peaks. An alarm function alerts the operator for any out-of-range readings. Summary reports are easily printed or copied to Excel or similar programs.



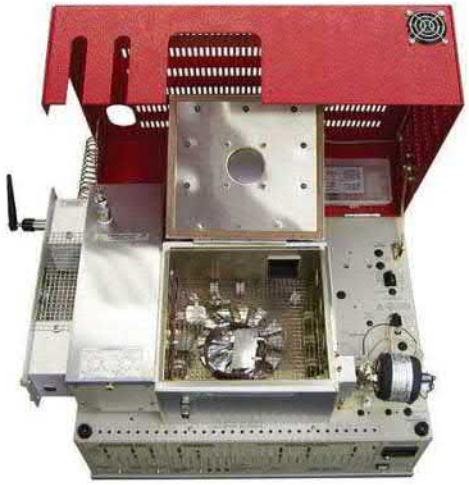
8610-0065 **Mud-Logging GC System**

OPTIONS & UPGRADES: One-Minute Analysis, PTV and split/splitless injectors, additional gas sampling valves
(VOLTAGE: for 115VAC, use 8610-0065-1; for 230VAC, use 8610-0065-2)

Environmental & BTEX GC Systems

- **PID Detector**
- **FID/DELCD Combination Detector**
- **Built-in Method 5030 or 5030/5035 compliant Purge & Trap**
- **Built-in "whisper quiet" Air Compressor**
- **6 channel PeakSimple Data System**
- **60 meter Capillary Column**

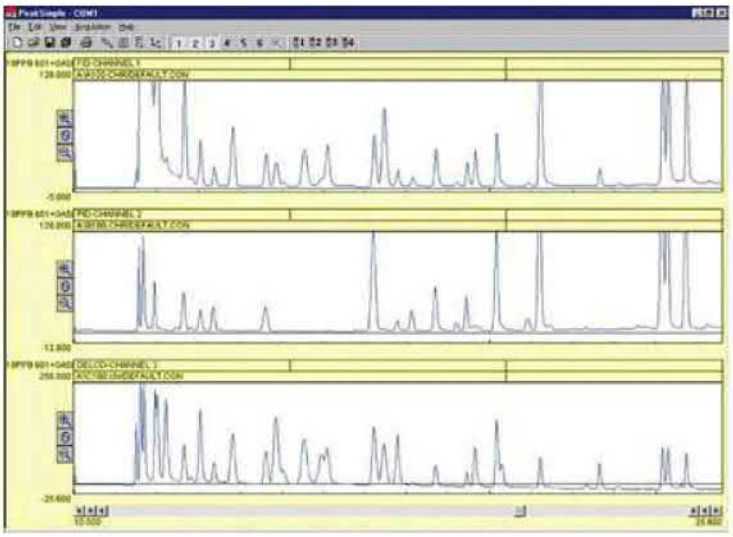
...on the compact 8610C chassis



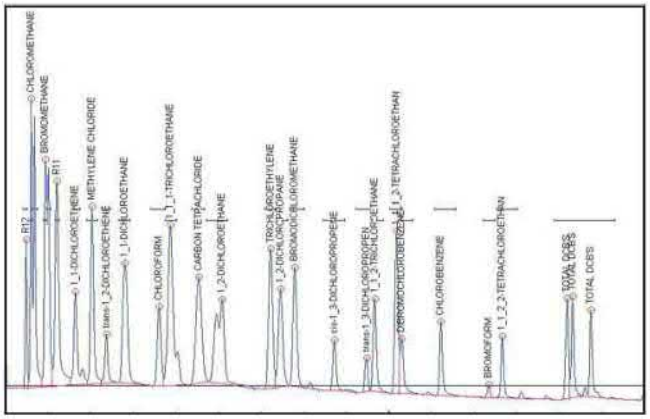
Optional Equipment:

- Thermal Desorber for semivolatiles
- An additional gas sampling valve
- A vacuum pump interface for air sampling
- Additional detectors

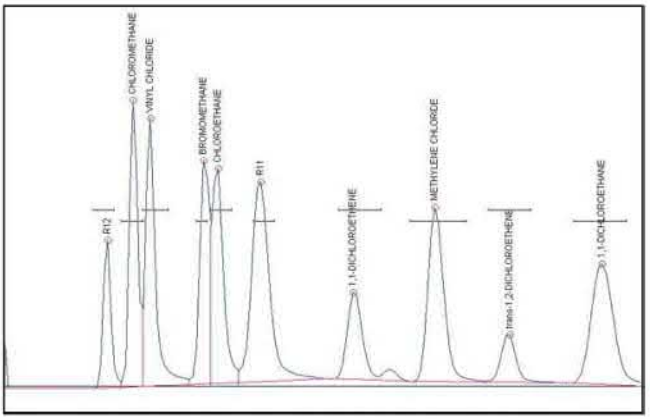
For laboratory or mobile field testing where space and versatility are critical, choose the Environmental GC system. Equipped with Method 5030 or 5030/5035 compliant Purge & Trap, PID and FID/DELCD detectors, it will easily generate certification quality data for EPA Methods 8021, 8010, 8015, TO-14 and many others. With the optional thermal desorber, you can quickly screen for pesticides, PCBs, diesel and other semivolatiles. The standard on- column injection port allows for syringe injection and a second injector may be installed if desired. For users who do not need the chlorine/bromine selective DELCD detector, the same GC configuration minus the DELCD is available as the BTEX GC.



These three chromatograms are from an analysis of Method 8021 standard plus gases on an SRI Environmental GC system. Peak identities can be confirmed by comparing the results from the three different detectors. Peaks which often coelute, such as benzene and carbon tetrachloride, can still be measured since the PID responds only to the benzene, while the DELCD only responds to the carbon tetrachloride.



The DELCD chromatogram is shown at left in more detail and with the peaks labeled for identification. The DELCD is completely selective for compounds containing chlorine and/or bromine. Other analytes do not respond at all, even at very high levels. The DELCD actually operates on the FID's exhaust gases; therefore, all contaminants are precombusted by the FID to CO2 and H2O.



The first few peaks in the 8021 standard, including vinyl chloride, are of special interest to many analysts. The chromatogram to the left shows the expanded detail of the first few peaks in the analysis (the VOC gases). Note the exceptionally good resolution and peak shape delivered by the SRI system with its dual trap technology.

Please see page 68 for more information on the Method 5030/5035 Purge & Trap.

8610-0059	**Environmental GC System**
8610-0050	**BTEX GC: same as the Environmental GC, but with PID and FID detectors only (no DELCD detector)**
8690-5052	**Upgrade to Method 5030/5035 compliant Purge & Trap**

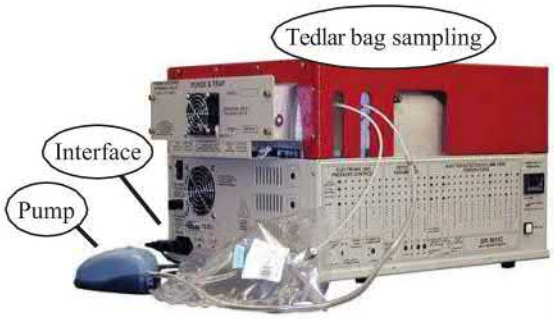
OPTIONS & UPGRADES: Thermal Desorber, split/splitless and PTV injectors, NPD detector, additional column(s), autosampler
(VOLTAGE: for 115VAC, use "part number-1" [ex: 8610-0059-1] for 230VAC, use "part number-2")

TO-14 Monitoring GC System

- **Dual trap TO-14 Air Concentrator**
- **PID and combination FID/DELCD Detectors**
- **Vacuum pump and PeakSimple controlled Interface**
- **Built-in "whisper quiet" Air Compressor**
- **6 channel PeakSimple Data System**
- **60 meter Capillary Column**

...on the compact 8610C chassis

For TO-14 analysis and ambient air analyses of all types, this GC system has everything you need in a compact, easy-to-transport package.



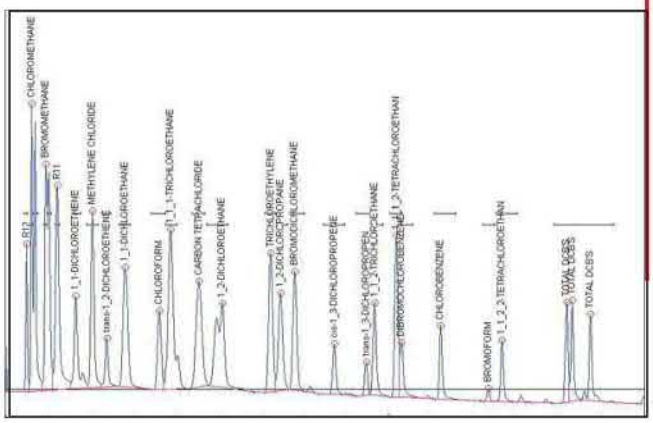
The dual-trap concentrator is similar to the SRI Purge & Trap, but has a gas inlet instead of a liquid purge vessel (a liquid purge head can be added if required). The innovative dual-trap design results in more efficient trapping and desorption than single trap designs, especially for early eluting peaks such as vinyl chloride. Please see page 61 for more information on the TO-14 Air Concentrator.

The 60 meter capillary column is the newest unbreakable, fused silica lined, stainless steel technology, which gives good separation of the TO-14 analytes with short run times. The PeakSimple data system controls and sequences the entire analysis, collecting the data from the three detectors, loading and desorbing the traps, then calculating and printing the results.

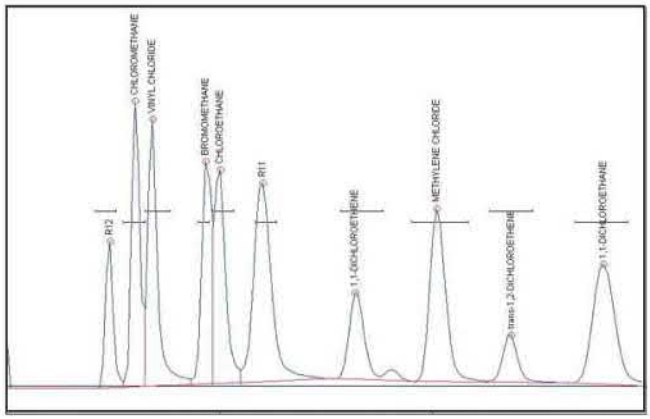
Since it is small enough to take on-site for real-time measurements, you can perform the analysis right at the source, avoiding the need for expensive, labor-intensive canister sampling. The vacuum pump interface allows the PeakSimple data system to turn the external vacuum pump ON/OFF under software control. The vacuum pump is used to draw ambient air through the traps for a precise amount of time, thus enabling the system to sample unattended. The built-in air compressor eliminates the hassle of transporting bulky air cylinders by providing an endless supply of combustion air for the FID/DELCD combination detector.

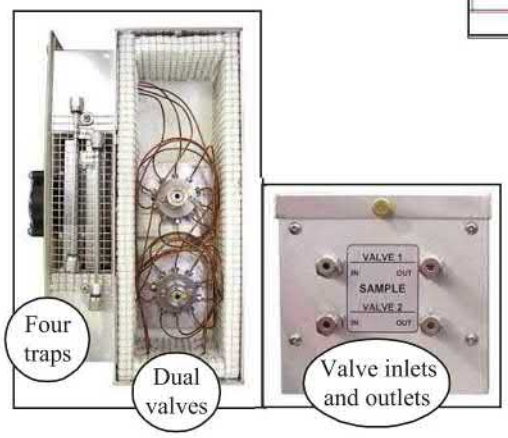
TO-14 Air Monitoring GC System

The DELCD is completely selective for compounds containing chlorine and/or bromine. Other analytes do not respond at all, even at very high levels. The DELCD actually operates on the FID's exhaust gases; therefore, all contaminants are precombusted by the FID to CO_2 and H_2O.



The first few peaks in the TO-14 standard, especially vinyl chloride, are of special interest to many analysts. This chromatogram shows the expanded detail of the first few peaks (the VOC gases) in the analysis shown above. Note the exceptionally good resolution and peak shape delivered by the SRI system's dual trap technology.



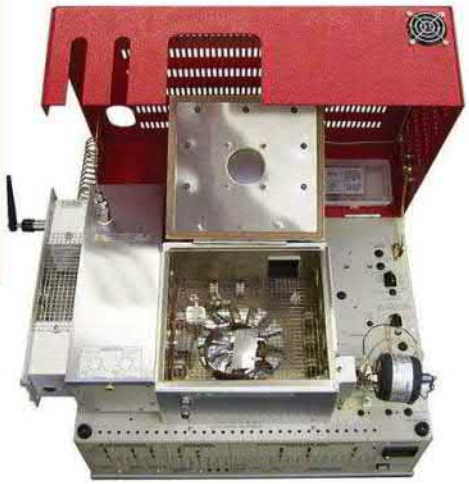


This SRI GC has been customized with a dual TO-14 Air Concentrator: four traps, and two gas sampling valves.

8610-0114 **TO-14 Air Monitoring GC System**

OPTIONS & UPGRADES: split/splitless and PTV injectors, additional TO-14 Air Concentrator, additional detector, additional column(s)
(VOLTAGE: for 115VAC, use 8610-0114-1; for 230VAC, use 8610-0114-2)

PCB GC System

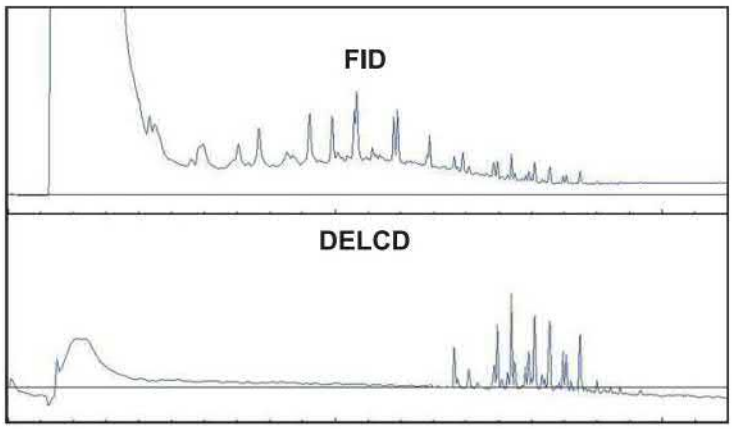


- **Thermal Desorber**
- **30 meter Capillary Column**
- **Built-in, "whisper quiet" Air Compressor**
- **1 Channel PeakSimple Data System**
- **On-Column Injector**

...on the compact 8610C chassis

The PCB GC System has everything you need to detect PCBs in soil and other solid matrices. The Thermal Desorber permits the user to inject and analyze PCBs with very high sensitivity and little or no sample preparation—no solvent extraction is required. Up to 1 gram of soil can be loaded into the reusable glass desorption tubes. For more information on the Thermal Desorber, please see page 66.

The FID detector responds to all hydrocarbons, and the DELCD identifies which are halogenated. Due to the extreme selectivity of the DELCD, PCBs can be discriminated even in the presence of massive hydrocarbon contamination. Because the FID precombusts the sample, the DELCD is protected from hydrocarbon contamination. Thetwochromatograms at right show the analysis of a 200ppm Aroclor 1254 sample in diesel with a PCB GC System.



The PCB GC System is also useful for detecting pesticides, PAHs, JP-4, kerosene, and diesel in soil. Soil samples are typically 20-50% water, so the FID flame is automatically relit after a large water peak. The 30 meter capillary column is included to efficiently separate hydrocarbons up to C40+. The built-in, "whisper quiet" air compressor provides an infinite supply of combustion air for the FID detector.

8610-0080 **PCB GC System**

OPTIONS & UPGRADES: additional detectors, split/splitless and PTV injectors.
(VOLTAGE: for 115VAC, use 8610-0080-1; for 230VAC, use 8610-0080-2)

Explosives GC System

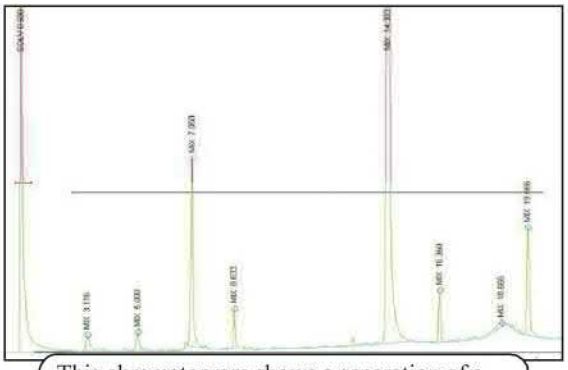
- Thermionic Ionization Detector (TID)
- Heated Flash Vaporization Injector
- Built-in "whisper-quiet"AirCompressor
- 1 channel PeakSimple Data System
- Can be run gasless in the field!
- 15 meter Capillary Column

...on the compact 8610C chassis

The Explosives GC System from SRI combines a Heated Flash Vaporization Injector, a built-in "whisper-quiet" air compressor and a Thermionic Ionization Detector for detection of nitroaromatic explosives such as TNT, and nitramine explosives such as RDX (C_4) and HMX.

If only the nitroaromatics are required, the GC will operate on the built-in air compressor's air alone, using air for both carrier gas and make-up gas. This GC is especially convenient for field monitoring, and screening of explosives-contaminated soil and water, as might be found in former military bases or practice ranges.

Unlike immunoassay or colorimetric detection methods which cannot discriminate the biodegraded transformation byproducts of TNT (2-amino-4, 6-dinitrotoluene, etc.) and which may not function well in the presence of high levels of interferences from other explosive compounds, the Explosives GC can separate and detect all the nitroaromatic compounds, even in the presence of interferences that would compromise other measurement techniques. For TNT and some other nitroaromatics, detection limits of 1ppb are routine. When the nitroamines must also be detected, nitrogen is used for the carrier gas, and air is used for TID makeup gas. Nitramine compounds like RDX exhibit lower response by a factor of 50.



This chromatogram shows a separation of a 10ppm explosives mix using an Explosives GC.

(ETV) program for measuring explosives in soil!
Tested by the EPA's Environmental Technologies Verification Download the ETV report and verification statement at www.epa.gov/etv/verifications/vcenter1-4.html
Also, download "On-Site Characterization of Explosive Residues in Soils and on Range Scrap Using GC-TID Analysis" by Alan Hewitt of the US Army Corps of Engineers at www.srigc.com

8610-1117	**Explosives GC System**

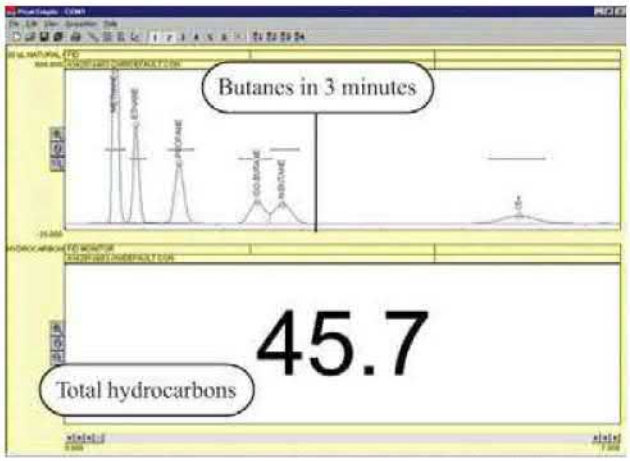
Rack Mount Mud-Logging GC System

- **Dual FID Detectors**
- **HayeSep-D Column**
- **10-port Gas Sampling Valve**
- **Standard & Sample Stream Solenoids**
- **Built-in "whisper quiet" Air Compressor**
- **6 Channel PeakSimple Data System**

...on the rack mountable 410 chassis

The Rack Mount Mudlogging GC system provides a continuous reading of total hydrocarbons in a gas stream while periodically performing a chromatographic separation to determine the exact composition of the sample gas stream.

At a regulated pressure, the sample gas stream flows through the loop of the 10 port gas sampling valve and also to the second FID detector, which continually monitors the total hydrocarbon content of the gas. Periodically, the gas sampling valve injects the contents of its loop into the GC column, where it is separated into the constituent hydrocarbon peaks and detected by the first FID detector. The operator controls the timing of the valve injections through the built-in, six channel PeakSimple data system. Solenoids for sample and standard stream switching are included and are selectable through the data system.



The PeakSimple data system controls the automated valve injection sequence and displays both the continuous total hydrocarbon reading as well as the separated peaks. An alarm function alerts the operator for any out-of-range readings. Summary reports are easily printed or copied to Excel or similar programs.

0410-0065 **Rack Mount Mud-Logging GC System**

OPTIONS & UPGRADES: One-Minute Analysis
(VOLTAGE: for 115VAC, use 0410-0065-1; for 230VAC, use 0410-0065-2)

Gas-less™ Educational GC System

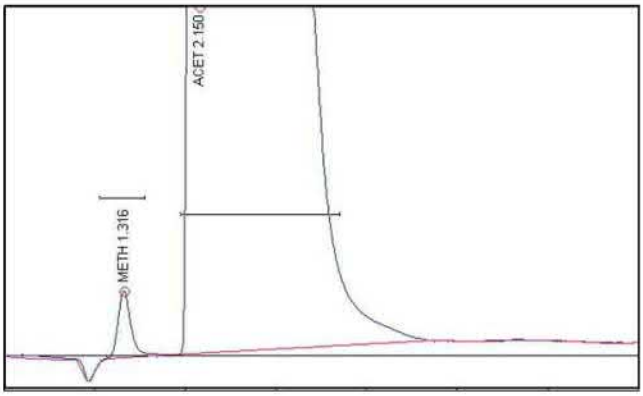
- **CCD Detector**
- **On-Column Injector**
- **Built-in "whisper quiet" Air Compressor**
- **1 channel PeakSimple Data System**
- **1 meter HayeSep-D Column**

...on the ultra compact 310 chassis

The Gas-less Educational GC system is ideal for demonstrating the principles of gas chromatography right in the classroom. The Gas-less Educational GC includes a built-in "whisper-quiet" air compressor and a CCD detector. The CCD detects combustible (hydrocarbon) molecules and it operates on air carrier gas from the internal air compressor.

This GC is perfect for teaching situations where compressed gas cylinders cannot be used due to safety considerations or budgetary limitations. Because it operates on its own infinite supply of room air, the Gas-less GC may be used to perform demonstrations in the classroom, instead of the lab. Most traditional GCs require helium carrier gas. Compared to the ongoing cost of cylinder rental, storage, and gas consumption, operation of the Gas-less Educational GC is essentially free, except for the minimal cost of electricity.

This chromatogram shows a separation of 1µL of 1000ppm methanol in acetone using a standard Gas-less Educational GC at 130°C.



The Gas-less Educational GC is equipped with a built-in, single channel PeakSimple data system, which provides powerful yet easy data acquisition, as well as temperature programming for the column oven. Fast cool-down fans automatically cool the column oven at the end of the analysis from 250°C to 50°C in less than five minutes.

0310-1006 **Gas-less™ CCD GC System with fast cool-down**

(VOLTAGE: for 115VAC, use 0310-1006-1; for 230VAC, use 0310-1006-2)
NOTE: Educational models are less expensive than equivalent GCs manufactured "à la carte" because of batch manufacturing efficiencies. No customization of educational models is available prior to initial sale, although normal factory retrofit services are available after delivery.

Educational TCD GC System

- **TCD Detector with User Replaceable Filaments**
- **Carrier Gas Electronic Pressure Control (EPC)**
- **Temperature Programmable Column Oven**
- **1 channel PeakSimple Data System**
- **1 meter Silica Gel Column**

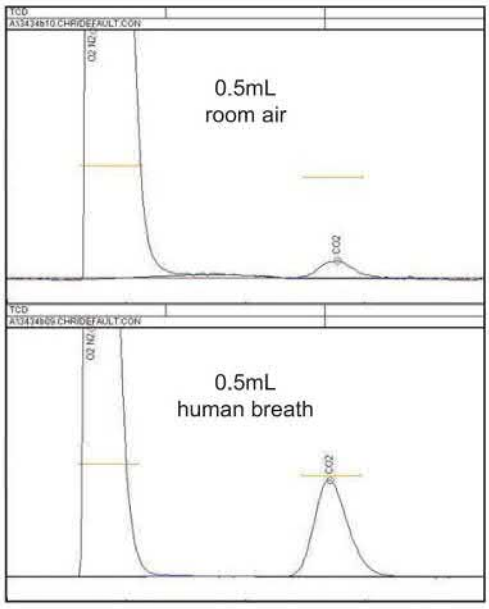
...on the ultra compact 310 chassis

The Educational TCD GC is ideal for undergraduate chemistry classes where the principles of gas chromatography are demonstrated on equipment identical to what students will encounter in industry. Because of their low cost and upgradability* with other SRI detectors and injectors, these GCs are also widely used by thrifty labs for simple applications such as landfill gas analysis, stack monitoring, and quality control.

Configured on the compact 310 chassis, the Educational TCD GC includes a traditional 4-filament Thermal Conductivity Detector that can heat to 275°C. The built-in single channel PeakSimple data system provides powerful yet easy data acquisition and temperature programming for the column oven.

The column oven is temperature programmable up to 300°C, and comes with fast cool-down fans. Electronic Pressure Control (EPC) for the carrier gas provides rock-solid retention time reproducibility.

These two similar chromatograms were produced under the same conditions. The first sample is room air, and the second is human breath. In both runs, the CO_2 peak is separated from the O_2/N_2 peak at 80°C on a standard Educational TCD GC with a Silica Gel column.



0310-1000 **Educational TCD GC System**

(VOLTAGE: for 115VAC, use 0310-1000-1; for 230VAC, use 0310-1000-2)

*Educational models are less expensive than equivalent GCs manufactured "à la carte" because of batch manufacturing efficiencies. No customization of educational models is available prior to initial sale, although normal factory retrofit services are available after delivery.

Educational FID GC System

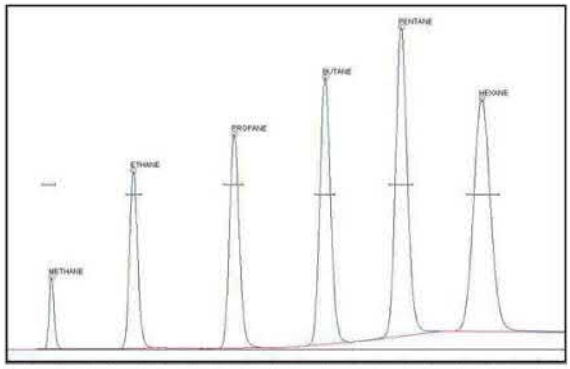
- **FID Detector**
- **On-Column Injector**
- **Carrier & Combustion Gas Electronic Pressure Control (EPC)**
- **Temperature Programmable Column Oven**
- **1 channel PeakSimple Data System**
- **1 meter Silica Gel Column**

...on the ultra compact 310 chassis

The Gas-less Educational GC system is ideal for demonstrating the principles of gas chromatography right in the classroom. The Gas-less Educational GC includes a built-in "whisper-quiet" air compressor and a CCD detector. The CCD detects combustible (hydrocarbon) molecules and it operates on air carrier gas from the internal air compressor.

The carrier gas and the FID combustion gases are all controlled by programmable electronic pressure regulators (EPCs). EPCs not only provide rock-solid retention time reproducibility, but allow the carrier gas to be pressure ramped (just as the column oven is temperature ramped) from the built-in PeakSimple data system.

This chromatogram shows a separation of 1000ppm C_1-C_6 hydrocarbons in room air using the 1 meter silica gel column.



The on-column injector is ideal for 1/8" packed or 0.53mm wide-bore capillary columns and is suitable for analytes ranging from methane to heavy, high-boiling hydrocarbons(C_{44}+). The column oven accepts column cage diameters up to 4 inches, is programmable up to 300°C and recycles quickly with its high speed cool-down fans.

0310-0004 **Educational FID GC System**

(VOLTAGE: for 115VAC, use 0310-0004-1; for 230VAC, use 0310-0004-2)

*Educational models are less expensive than equivalent GCs manufactured "à la carte" because of batch manufacturing efficiencies. No customization of educational models is available prior to initial sale, although normal factory retrofit services are available after delivery.

How to Build a Custom SRI GC

1. Pick a chassis

WHAT IS YOUR APPLICATION?	
• If you will be injecting by gas sampling valve, purge & trap, thermal desorber or any other injector types in addition to on-column, then choose our versatile Model 8610C, which can mount up to five different injectors simultaneously. 	• If you will be injecting by syringe only, you can choose the ultra-compact Model 310. 
• For dual oven applications or "two GCs in one," choose the 8610D chassis. 	• For industrial rack systems, choose our 410 rack mount chassis. 
• For added compatibility with autosamplers and vertical injectors, choose the 8610V chassis. 	• If you want to add detectors to an existing GC, choose the Model 110. 

For any model chassis except the 110, you must specify the data system model you want. A single channel data system is included as standard equipment with the 8610, 410 and 310 GCs. If you'll be ordering more than one detector on your GC, you will need a six channel data system.

2. Choose your detectors

Detector types are selected depending on the particular application, the required detection limit, matrix interferences and/or regulatory guidelines. Since all five of our chassis can mount up to four (sometimes five or six) detectors simultaneously, you can perform a surprising variety of applications with one instrument.

DETECTOR	SELECTIVITY	SENSITIVITY (approx.)
CCD	hydrogen and hydrocarbons	500ppm
TCD	universal	200-500ppm
FID	hydrocarbons	1ppm
DELCD	chlorinated and brominated molecules	10ppb
FID/DELCD	hydrocarbons, chlorinated and brominated molecules	10ppm
HID	universal, except neon	10ppm
PID	aromatics and molecules with double carbon bonds	10ppb
NPD	nitrogen and phosphorus	100ppb
TID	nitro functional groups (TNT, etc.), chlorinated phenols at slightly less sensitivity	10ppb, 50ppb
ECD	electronegative compounds (esp. chlorinated, fluorinated, or brominated molecules)	10ppb
FPD	sulfur and phosphorus	200ppb and 10ppb
FPD/FID	sulfur, phosphorus and hydrocarbons	200ppb, 10ppb, and 100ppm
Dual FPD	sulfur and phosphorus simultaneously	200ppb and 10ppb
FID Dual FPD	hydrocarbons, sulfur and phosphorus simultaneously	100ppm, 200ppb and 10ppb

3. Choose your injectors

Injector types are selected by the user depending on the particular measurement application, detection limit and regulatory requirements. Twelve injector types are available for installation on SRI GCs. Up to five injectors may be mounted simultaneously on the Model 8610C or 8610D. The Model 310 will accommodate a single On-column, Heated Flash Vaporization, Heated Split/Splitless, or PTV Injector. The On-Column Injector is standard equipment on every 8610C, 8610D and 310 GC. Heated Flash Vaporization, Heated Split/Splitless and PTV Injectors are all upgrades to the standard On-Column Injector. A vertical injector option is available on the 8610V.

SAMPLE TYPES AND APPROPRIATE INJECTORS	
LIQUIDS	• On-column, Heated Split/Splitless, Heated Flash Vaporization, PTV, Heated Static Headspace, Purge & Trap, Liquid Injection Valve, Liquid Autosamplers, or Headspace Autosampler
SOLIDS	• Thermal Desorber, Heated Static Headspace, PTV, or Headspace Autosampler
GASES	• On-column, Gas Sampling Valve, Method TO-14 Air Concentrator, or Heated Static Headspace
SPME FIBERS	• Heated Flash Vaporization with Low Volume SPME Liner, or Heated Split/Splitless

4. Accessorize

Our built-in, "whisper quiet" air compressor can supply air carrier gas or detector makeup gas.

Gas Line Installation Kits for any type of gas required for SRI GC operation.

The Methanizer accessory allows FID detection of CO and CO_2 down to ppm.

Although many injectors and detectors can be built into every GC chassis, there are instances where certain components would occupy the same space, or we just run out of room. If you are not sure if everything you want will fit, call one of our knowledgeable technical support agents for help.

8690-CONF	**Custom Configuration**

SRI Gas Chromatograph Overview

The full-featured Model 8610 GC can mount up to four detectors, five injectors and a host of accessories, yet is still small enough to ship UPS/FedEx or even carry with you on your expeditions into the field. It also fits easily on your crowded laboratory bench.

The Model 8610D is identical to the 8610C except that it has dual temperature programmable column ovens.

The 8610V GC is a vertical oven version of the 8610C which interfaces to most autosamplers.

The compact Model 310 can mount four detectors and one injector. Consider this GC when you want the smallest laboratory GC available and plan to inject using a syringe.

Choose the rack-mountable Model 410 for standard 19-inch industrial rack systems.

The ultra-compact Model 110 can mount up to four detectors and connects to a host GC (SRI or another brand) via a heated transfer line. Pick this model when you need to add detectors to an existing GC or want GC detector performance without a chromatographic separation (total hydrocarbon stream monitoring, etc).

Standard Features of All SRI GC Models:
• Built-in, single channel PeakSimple data system
• Heavy-duty, all-aluminum construction for lightweight durability.
• "At-a-glance" panel display that reports the status of system heating, pressure, and voltage control zones to the bright and easy-to-read display.
• Electronic Pressure Control (EPC) for all regulated gas pressures. EPC results in enhanced day-to-day reproducibility compared to mechanical pressure regulators and allows the carrier gas pressure to be ramped from the data system.
• Four, five or six simultaneous detector capability—choose from 16 detector types.
• Two year warranty and FREE technical support.
• Rugged reusable plastic container which ships UPS/FedEx. The GC is secured in the shipping container using a system of belts and buckles which eliminates the need for extra styrofoam peanuts, bubble wrap and other annoying packaging materials.

Since the typical GC weighs about 60lbs in the shipping container, it is easily carried by one person.

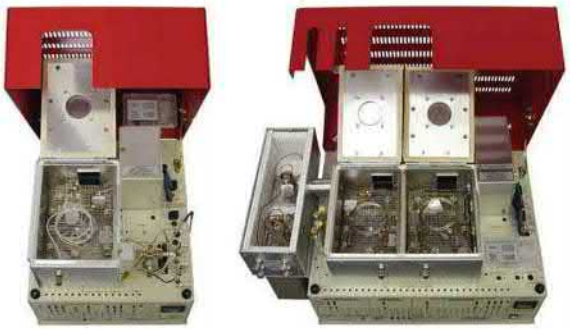
GC Column Oven Options

Three temperature programmable oven types are available for SRI GCs:

1. The large air bath column oven comes standard on the 8610C chassis. This oven will accommodate a single column on a seven inch diameter cage, or multiple columns coiled on smaller cages or bundled without a cage. This oven is rated to 400°C and is equipped with a 600 watt heater and fast cool-down fans.

2. The 8610V column oven is temperature programmable from ambient to 400°C with unlimited ramps and holds, and fast cool-down. The larger oven accommodates multiple columns and detectors.

3. The small air bath column oven comes standard on the Model 310 chassis. This oven will fit multiple columns coiled within five inches diameter (3.5" or 4" coil size preferred). This oven is also rated to 400°C and is equipped with a 600 watt heater and fast cool-down fans. With the same heater wattage and cool down fans as the large oven in a smaller volume, this oven heats and cools faster. Dual, independently programmable small air bath ovens are installed on the Model 8610D GC chassis. The second oven is 4.5" wide, so only columns coiled smaller than four inches in diameter can be used.



Model 8610C Gas Chromatograph

- **Mounts up to Six Detectors and Five Injectors**
- **Ambient to 400°C Temperature Programmable Column Ovens**
- **Dimensions: 19" wide x 13.5" high x 14.5" deep**
- **Implement virtually any EPA or ASTM method**

The Model 8610C Gas Chromatograph is our most versatile and popular model. While it is very compact next to comparable laboratory GCs from other manufacturers, it is large and flexible enough to perform an amazing variety of applications. See our Preconfigured GC section (starting on page 3) for examples of the 8610C adaptability.

Up to six detectors can be installed on the same 8610C GC.

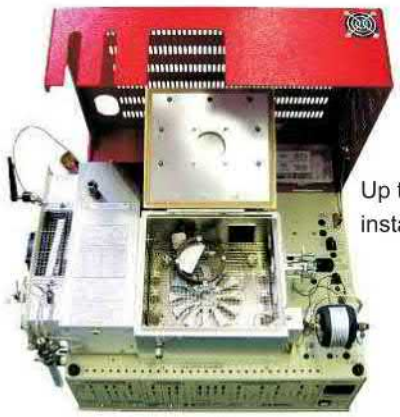
ECD

PID

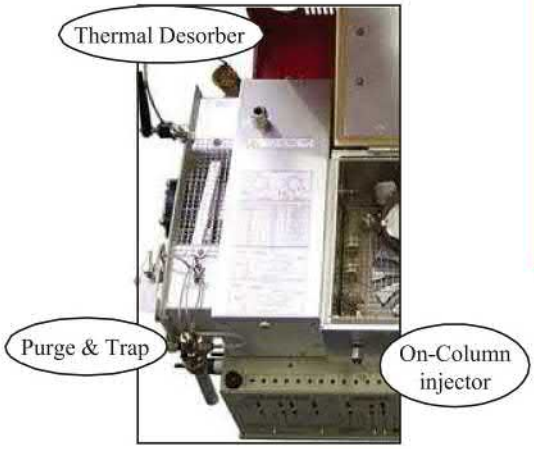
FID / DELCD

FPD

Model 8610C Gas Chromatograph



Up to five injectors can be installed on the same GC.



The 8610C column oven is temperature programmable from ambient to 400°C with unlimited ramps and holds, and fast cool-down. This airbath oven can hold a standard seven inch diameter megabore column cage or multiple columns with smaller coil sizes.

The 8610C chassis can be configured to implement virtually any EPA or ASTM method while remaining small enough to ship via FedEx. A reusable shipping crate comes with every GC.

Standard Equipment:
Model 8610C chassis; ambient to 400°C column oven; On-Column injector with carrier EPC; PeakSimple data system; "at-a-glance" display of temperatures, pressures, voltages and detector parameters; operator's manual; accessory kit; heavy duty re-useable shipping container. To completely configure a Model 8610C GC, most users will need to specify one or more detectors, injectors and columns. Some users may also need a Gas Line Installation Kit (see page 77) for each gas required (helium, hydrogen, nitrogen, etc.).

8610-1003	**Model 8610C chassis with 1 channel USB PeakSimple data system**
8610-6003	**Model 8610C chassis with 6 channel USB PeakSimple data system**

VOLTAGE: for 115VAC, use "part number-1" [ex: 8610-1003-1] for 230VAC, use "part number-2"

Model 8610D Dual Oven Gas Chromatograph

- **Dual Ambient to 400°C Temperature Programmable Column Ovens**
- **Dimensions: 19" wide x 13.5" high x 14.5" deep**
- **Mounts up to Six Detectors and Five Injectors**

The Model 8610D Gas Chromatograph is the only commercially available dual oven GC. It is similar to the 8610C, except that two smaller column ovens are substituted for the larger 8610C column oven. Both of the dual ovens are independently temperature programmable from ambient to 400°C, with unlimited ramps and holds, plus fast cool-down. Each 8610D column oven can accommodate a four inch diameter wound column, capillary or packed. Almost all column manufacturers now supply columns of this size. The dual column ovens can be used to accomplish sophisticated multidimensional GC separations, where the peaks eluting from one column are transferred to another column for further separation. The dual ovens can be used to double sample throughput for "two GCs in one" cost and space savings.

Standard equipment:
Model 8610D chassis; dual ambient to 400°C column ovens; On-Column injector (oven #1 only) with carrier EPC; single channel PeakSimple data system; "at-a-glance" display of temperatures, pressures, voltages, and detector parameters; operator's manual; accessory kit; heavy duty reuseable shipping container. To completely configure a Model 8610C GC, most users will need to specify one or more detectors, injectors, and columns. Some users may also need a Gas Line Installation Kit (see page 77) for each gas required (helium, hydrogen, nitrogen, etc.).

8610-1004	**Model 8610D chassis with 1 channel USB PeakSimple data system**
8610-6004	**Model 8610D chassis with 6 channel USB PeakSimple data system**

VOLTAGE: for 115VAC, use "part number-1" [ex: 8610-1004-1] for 230VAC, use "part number-2"

Model 8610V Gas Chromatograph

and 121-Vial Autosampler

- **Ambient to 400°C Temperature Programmable Column Oven**
- **Unlimited Ramps and Holds**
- **Multiple Columns and Detectors**

The Model 8610V Gas Chromatograph is one of our most popular models. While it is very compact next to comparable laboratory GCs from other manufacturers, it is large enough and flexible enough to perform an amazing variety of applications. The 8610V column oven is temperature programmable from ambient to 400°C with unlimited ramps and holds, and fast cool-down. The larger oven accommodates multiple columns and detectors.

The all electric sample system eliminates air bubbles, and the variable fill speed allows for a wide range of sample viscosities. The syringe may be washed with solvent or sample.

AUTOSAMPLER FEATURES

- Holds 110 2mL vials
- Methods Linking
- Multi-Step Automatic Injection Sequence
- Direct Injection, No Transfer Lines

MEMORY OPTIONS

- Analytical method
- Number of injections for each sample
- Pre and Post washing solvent position
- Internal standard position (if used)

The Autosampler is made to meet the high throughput injection needs of your GC analysis. The swivel head design simulates the movements of manual direct injection and eliminates the need for transfer lines, as well as leaving the injection port free for manual injections. Up to 10 analytical methods may be stored in the Autosampler memory.

Let us help you custom configure your 8610V to implement virtually any EPA or ASTM method

8610-2003	**Model 8610V Gas Chromatograph with vertical injector 1 Channel USB**
8610-7003	**Model 8610V Gas Chromatograph with vertical injector 6 Channel USB**
	Model 8610V HTA 110-Vial Autosampler

VOLTAGE: for 115VAC, use "part number-1" [ex: 8610-2003-1] for 230VAC, use "part number-2"

Model 310 Gas Chromatograph

- **Small size, full performance**
- **Dimensions: 12.5" wide x 13.5" high x 14.5" deep**
- **Ambient to 400°C Temperature Programmable Column Oven**
- **Mounts up to Four Detectors**

The Model 310 Gas Chromatograph is the smallest GC which still retains the performance of a full-sized laboratory instrument. The Model 310 column oven is temperature programmable from ambient to 400oC, with unlimited ramps and holds, plus fast cool-down. The column oven will accommodate four inch diameter columns, capillary or packed. Up to four detectors can be mounted simultaneously with a single On-Column, Heated Flash Vaporization, Split/Splitless or PTV injector. All gases are controlled by electronic pressure controllers (EPC), and the carrier pressure is programmable. The PeakSimple data system is built in for easy connection to your PC. The Model 310 was designed to satisfy the needs of chromatographers who demand the utmost in portability, small size and high performance, but whose application does not require gas sampling valves, purge & trap, or multiple injector types.

Standard equipment:
Model 310 chassis; ambient to 400°C column oven; On-Column injector with carrier EPC; single channel PeakSimple data system; "at-a-glance" display of temperatures, pressures, voltages, and detector parameters; operator's manual; accessory kit; heavy duty reuseable shipping container. To completely configure a Model 310 GC, most users will need to specify one or more detectors, a column, and an injector upgrade. Some users may also need a Gas Line Installation Kit (see page 77) for each gas required (helium, hydrogen, nitrogen, etc.).

0310-1003	**Model 310 chassis with 1 channel USB PeakSimple data system**
0310-6003	**Model 310 chassis with 6 channel USB PeakSimple data system**

VOLTAGE: for 115VAC, use "part number-1" [ex: 0310-0003-1] for 230VAC, use "part number-2"

Model 410 Rackmount Gas Chromatograph

- **Multiple Detector Capability**
- **Optional Gas Sampling Valve**
- **For Industrial Gas Sampling applications**
- **Fits Shelf-equipped 19-inch Racks**

The Model 410 Rack-Mount GC is a compact, rack mountable instrument which offers the performance of a full-sized laboratory gas chromatograph. Excellent for industrial applications, or any facility without benchtop workspace, the Model 410 mounts in standard 19-inch racks. It can mount multiple detectors, a single On-Column, Heated Flash Vaporization, Split/Splitless or PTV injector and a gas sampling valve. The column oven will accommodate four inch diameter columns, capillary or packed. All gases are controlled by electronic pressure controllers (EPC) and the carrier gas pressure is programmable. With the built-in PeakSimple data system, all that is needed to connect the GC to your computer is a serial or USB cable, depending upon the data system option selected. The Model 410 Rack-Mount GC features the familiar, easy-to-read SRI display panel and mounts on your existing sliding shelf for accessibility.

Standard equipment:
Model 410 chassis; ambient to 400°C column oven; On-Column injector with carrier EPC; single channel PeakSimple data system; "at-a-glance" display of temperatures, pressures, voltages, and detector parameters; operator's manual; accessory kit; heavy duty reuseable shipping container. To completely configure a Model 410 GC, most users will need to specify one or more detectors, a column, and an injector upgrade. Some users may also need a Gas Line Installation Kit (see page 77) for each gas required (helium, hydrogen, nitrogen, etc.). This system does not include the rack itself.

0410-1000	**Model 410 chassis with 1 channel USB PeakSimple data system**
0410-6000	**Model 410 chassis with 6 channel USB PeakSimple data system**

VOLTAGE: for 115VAC, use "part number-1" [ex: 0310-0003-1] for 230VAC, use "part number-2"

Model 110 Stand-alone Detector Chassis

- **Add up to Four Detectors to Any GC**
- **Dimensions: 8.5" wide x 13.5" high x 14.5" deep**
- **Heated Transfer Line for connection to Host GC**

The Model 110 Chassis can be configured as a stand-alone detector chassis, capable of mounting any combination of up to 4 detectors. The Model 110 is equipped with a heated transfer line for connection to the host GC, from SRI or any other manufacturer. The heated transfer line requires only a small hole in the host GC's column oven, so the 110 makes it easy to add detectors even to older units that are out of production. The fused silica lined, metal heated transfer line operates at 200°C, which is hot enough for most applications. However, analysis of high boiling analytes may not be possible if they could condense in the line at this temperature. For those detectors that require support for gases such as hydrogen or air, the 110 is equipped with electronic pressure controllers (EPC) for each gas. An optional "whisper quiet" air compressor may be installed to provide air for FID, DELCD, and/or FPD detectors. The standard Model 110 is equipped with analog signal cable output (0-5V) for connection to your data system, integrator or strip chart recorder. A single channel or six channel PeakSimple data system may be installed for PC-based data acquisition.

The Model 110 chassis has been used for a variety of unique custom solutions. Please contact us regarding your application needs.

Standard equipment:
Model 110 chassis; heated transfer line; "at-a-glance" display of detector temperatures, pressures, and voltages; analog signal cable for connection to data system; operator's manual; accessory kit; heavy duty reuseable shipping container. To completely configure a Model 110 GC, most users will need to specify one or more detectors to be mounted on the chassis.

0110-0003 **Model 110 chassis with Standard Equipment**
VOLTAGE: for 115VAC, use "part number-1" [ex: 0110-0003-1] for 230VAC, use "part number-2"

GC Detector Overview (16 Types)

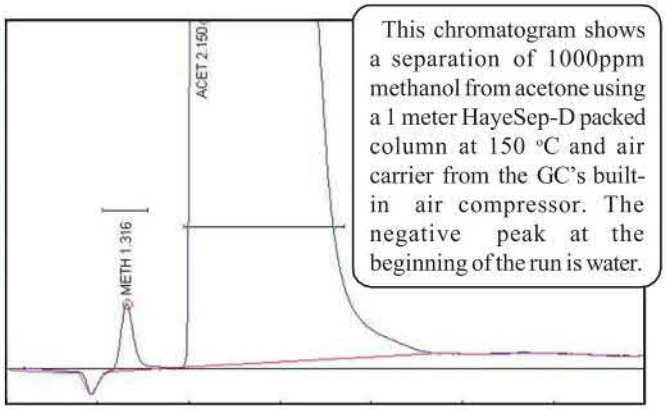
Each detector is equipped with Electronic Pressure Controlled (EPC) support gases, such as hydrogen and air for the FID, a thermostatted heater block for temperature stability, and internal amplifier electronics. All detectors require factory installation. Prices listed are for the detector mounted on an SRI chassis.

1. **CCD - Catalytic Combustion Detector**
2. **TCD - Thermal Conductivity Detector**
3. **FID - Flame Ionization Detector**
4. **DELCD - Dry Electrolytic Conductivity Detector**
5. **FID/DELCD - Combination FID and Dry Electrolytic Conductivity Detector**
6. **HID - Helium Ionization Detector**
7. **PID - Photo Ionization Detector**
8. **NPD - Nitrogen-Phosphorus Detector**
9. **NPD/DELCD - Combination NPD and DELCD Detector**
10. **TID - Thermionic Ionization Detector**
11. **FPD - Flame Photometric Detector**
12. **FPD/FID - Combination FPD and FID Detector**
13. **Dual FPD - Dual Wavelength for both Sulfur and Phosphorus**
14. **FID Dual FPD - Dual FPD plus FID Combination Detector**
15. **ECD - Electron Capture Detector**
16. **RGD – Reduction Gas Detector**

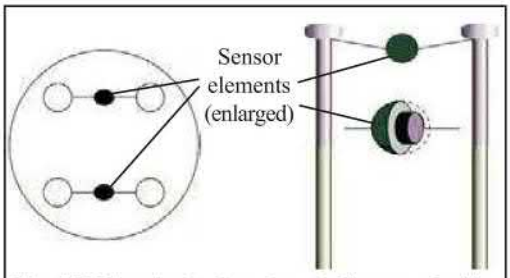
Detector types are selected by the user depending on the particular measurement application, detection limit required, matrix interferences and regulatory guidelines. Some rare combinations of detectors may conflict due to space limitations.

CCD - Catalytic Combustion Detector

- **Detects Down to 500ppm**
- **Hydrocarbon and Hydrogen Selective**
- **Gasless Operating Capability**
- **Inexpensive and Rugged**
- **Built-in Spare!**



This chromatogram shows a separation of 1000ppm methanol from acetone using a 1 meter HayeSep-D packed column at 150 °C and air carrier from the GC's built-in air compressor. The negative peak at the beginning of the run is water.



The CCD housing is about 1cm in diameter. Inside, there are 2 sensor elements consisting of a platinum wire embedded in a catalytic ceramic bead.

The CCD is about as sensitive as a TCD, but it has the hydrocarbon selectivity of an FID while capable of operating on air alone. Because the CCD needs no compressed gases like hydrogen or helium, it can be used in SRI's Gas-less™ GCs where a built-in, "whisper quiet" air compressor supplies the ambient air carrier gas.

The CCD can also be used as a hydrocarbon monitor in nonchromatographic applications where the CCD senses the total hydrocarbon content of a flowing air stream, or as a hydrogen/hydrocarbon leak detector.

The CCD detector sensor is rugged and can be expected to last a long time. A second sensor is included in the detector housing at no extra cost, providing a built-in replacement should the first sensor become inoperable. Replacement sensor sets install in minutes without tools and are very economical, making this detector a good choice for academic settings where the detector may be damaged by inexperienced operators.

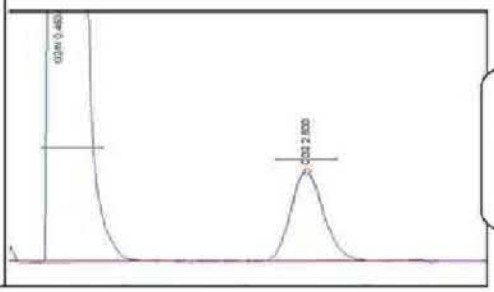
The Catalytic Combustion Detector consists of a tiny coil of platinum wire embedded in a catalytic ceramic bead. A small electric current flows through the platinum coil, heating the ceramic bead to around 500°C. The CCD is maintained in an oxidative environment typically by using air carrier gas. When a hydrogen or hydrocarbon molecule impacts the hot bead, it combusts on the surface and raises the temperature and resistance of the platinum wire. This resistance change causes the detector output signal to change, thus producing a peak. The brass detector housing is mounted on a stainless steel bulkhead fitting, which is secured directly to the wall of the GC column oven.

8690-2007	**CCD detector**
8670-2007	**Replacement CCD detector housing (2 sensors in 1 housing)**

TCD - Thermal Conductivity Detector

- "Universal" Detector
- Detects from 100% Down to 200-500ppm
- Easily Replaceable Filaments
- Thermostatted up to 275°C

Our TCD is equipped with user-replaceable filaments, so it can be quickly returned to service in the event of a burnout.



This chromatogram shows [illegible] separated from air using a one meter Silica gel packed column at 80°C

Because it detects all molecules, the Thermal Conductivity Detector is commonly used for fixed gas analysis (O_2, N_2, CO, CO_2, H_2S, NO, NO_2, etc.) where the target analytes do not respond well on other, more sensitive detectors. The TCD can detect concentrations from 100% down to around 100ppm on a flat baseline with sharp peaks. Where the peak is broad or the baseline is not perfectly flat, detection limits of 300ppm are more realistic. For lower detection limits, the HID may be more suitable for inorganics, while the FID provides 1ppm detection for hydrocarbon species.

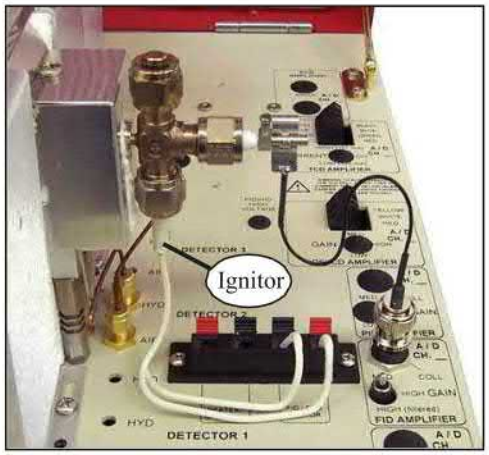
The TCD consists of four tungsten-rhenium filaments in a Wheatstone bridge configuration. Electric current flows through the filaments, causing them to heat up. Carrier gas (typically helium, which has very high thermal conductivity) flows across the filaments, removing heat at a constant rate. Two of the filaments are exposed only to carrier gas (reference), and two are exposed to the carrier/sample flow. When a sample molecule with lower thermal conductivity than the carrier gas exits the column and flows across the two sample filaments, the temperature of the filaments increases. This temperature increase unbalances the Wheatstone bridge and generates a peak as sample molecules transit through the detector.

A filament protection circuit prevents filament damage by disabling the current if carrier pressure is not detected by the GC, but cannot prevent filament damage under all circumstances. The TCD is equipped with user-replaceable filaments in the event of a burnout.

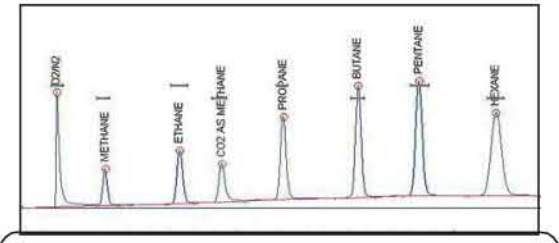
8690-0007	TCD detector

FID - Flame Ionization Detector

- **Hydrocarbon Selective**
- **Robust, Linear, Stable**
- **Detects Down to 1ppm**
- **Unique Ceramic Ignitor can run HOT continuously to keep flame lit**



The Flame Ionization Detector is the most commonly used GC detector, responding linearly from its minimum detectable quantity of about 100 picograms to almost 100%.



This chromatogram shows 250ppm C_1-C_6 hydrocarbons (methane through hexane) standard as detected by the FID. CO_2, also at 250ppm, is converted to methane by the Methanizer accessory in the jet of the FID detector.

The FID responds to any molecule with a carbon-hydrogen bond, but not at all, or poorly, to compounds such as H_2S, CCl_4 or NH_3. The FID response is very stable from day to day, and is not susceptible to contamination from dirty samples or column bleed.

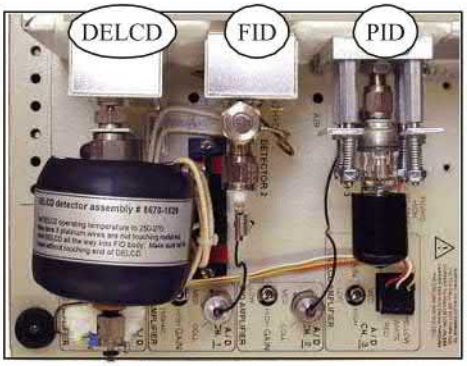
The SRI FID employs a unique ceramic ignitor which can run hot continuously, immediately reigniting the flame even when presented with large water injections or pressure surges from column backflush.

The FID is thermostatted in an aluminum block up to 600°C, and is equipped with an electrometer amplifier with HIGH, HI-FILTERED (for extra noise immunity), and MEDIUM gain settings. Hydrogen and air flow are controlled using Electronic Pressure Controllers (EPC) for high precision. The optional built-in, "whisper-quiet" air compressor can be used to supply the air for the FID, eliminating the bulky air cylinder.

If CO and CO_2 are target analytes, order our Methanizer accessory (page 74) for the FID detector. The Methanizer allows the FID to detect low levels of CO and CO_2 by converting them to methane without changing their retention times. Thermostatted to 380°C, the Methanizer is a special catalyst jet which can be removed for normal FID operation.

8690-0010	**FID detector**
8690-0082	**Methanizer Jet for low level CO & CO_2**
8690-0070	**Optional 115VAC 60Hz built-in "whisper quiet" air compressor**
8690-2270	**Optional 230VAC 50Hz built-in "whisper quiet" air compressor**

DELCD - Dry Electrolytic Conductivity Detector

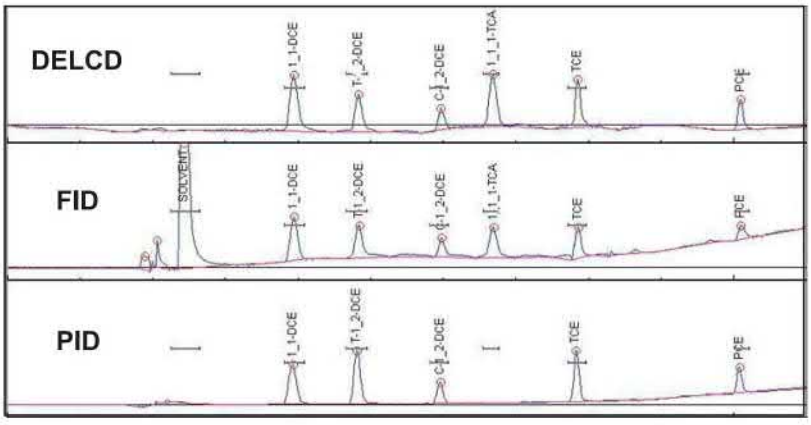


- **Nonradioactive alternative to ECD!**
- **High Sensitivity—Detects down to 10ppb**
- **Selective to Chlorinated and Brominated molecules**
- **Best used with Headspace or Purge & Trap injectors**
- **Can be Combined with FID, NPD, or TID detectors**

The DELCD is useful for low-level detection of chlorinated and brominated solvents in environmental samples and other trace analyses. In the picture above, a DELCD is mounted next to FID and PID detectors on an SRI GC. The three chromatograms below are from a similar SRI GC.

The Dry Electrolytic Conductivity Detector possesses sensitivity much like the ECD, except it is more selective to halogens and blind to oxygen. The SRI DELCD differs from the traditional wet ELCD in that it does not use a solvent electrolyte or nickel reaction tube, and the reaction products are detected in the gaseous phase. In the high sensitivity mode (no hydrogen, using dry tank air), the DELCD can detect down to the low picogram range. In this mode, the DELCD is about 100 times more sensitive than the FID/ DELCD. However, the high sensitivity DELCD is susceptible to contamination from high concentrations of chlorinated hydrocarbons and hydrocarbon solvents.

A 50ppb Japanese VOC standard was placed into a VOA vial with water, then allowed to equilibrate at room temperature for 45 minutes before 1mL of the headspace was injected. The FID chromatogram shows all the components and the solvent. The DELCD does not respond to the solvent, and the PID does not detect the 1,1,1-TCA.



8690-1026	**DELCD detector**