



NATURAL GAS

ANALYZER



SCION NATURAL GAS ANALYZERS

NATURAL GAS IS BOUGHT AND SOLD AS A BULK COMMODITY WITH PRICE BASED ON ITS ENERGY CONTENT. IT IS VERY IMPORTANT FOR ALL STAKEHOLDERS IN THE NATURAL GAS SUPPLY AND CONSUMER CHAIN TO ACCURATELY DETERMINE THE HEATING VALUE OF THEIR STREAMS.

SCION Instruments offers a full range of GC based solutions for the analysis of natural gas. The analyzer family is designed to offer superior results through the use of industry proven hardware, software, optimized columns and consumables, and is backed by a team of global sales and support specialists.



Figure 1: The SCION 8500 GC NGA Analyzer.



A complete range of natural gas analysis (NGA) solutions.

SCION offers a range of NGA analyzers to meet the broadest range of stream sample types and throughput needs, whether the analysis is conducted in a laboratory, at-line or in the field. The NGA portfolio offers 'simple' (single column) to extended configurations, allowing the determination of as many sample components as possible



Easy to operate and powerful GC solutions.

SCION GC with CompassCDS Chromatography Software, form a powerful combination and do not require a high degree of skill to be used successfully.



A highly flexible analysis solution.

Flexibility to analyze natural gas, liquified petroleum gas or natural gas liquids (NGL). SCION's GC based NGA analyzers can be configured to measure the composition of NGL streams through the use of LSV/Vaporizers, ensuring sample integrity is consistently maintained.



Operational procedures are fully documented.

In addition to incorporating proven GC hardware and software, the SCION NGA analyzers also arrive with the pre-loaded analysis method(s) and documentation specific to the application.



A comprehensive, single-vendor solution.

SCION is proud to provide complete solutions. The hardware, software, application optimization, documentation, installation and performance verification are all delivered by SCION or our recognized distributors.



SOLUTIONS FOR NATURAL GAS ANALYSIS

Turnkey Solutions

Gas chromatography offers a proven means to determine the composition of natural gas; in combination with optional special Gas Calculation software the heating value and other natural gas physical constants are calculated quickly and cost effectively.

SCION's natural gas analyzers (NGAs) are standard 'turnkey' systems pre-configured and tuned at the factory to ensure their compliance with standard methods used to determine the composition followed by calculating the heating value of natural gases and related streams. They can also be specially configured to determine other components of interest (eg. sulfur compounds), to ensure suitability for use in downstream processes. The analyzers are based on the SCION GC gas chromatograph platforms and SCION's CompassCDS Chromatography Software.

All systems employ a proven and optimized multi-channel/multi-dimensional approach to quantify individual components and determine the heating/calorific value of natural gas.

SCION offers several NGA analyzers to meet the widest range of analysis needs.

NGA (System A)

This is the most simplistic of all available natural gas systems. The system employs a single valve, single column, a Thermal Conductivity Detector (TCD) and Flame Ionization Detector (FID).

The TCD is used for the determination of Air, CH₄, CO₂ and Ethane, while the FID, connected in series, determines hydrocarbons in low concentrations, i.e. C3-C5 and C6+ backflushed grouping peak (late back-flush). A single unheated 4 port Liquid Sampling Valve (LSV) is available for LPG type samples. The FID allows for low level determination of hydrocarbons.

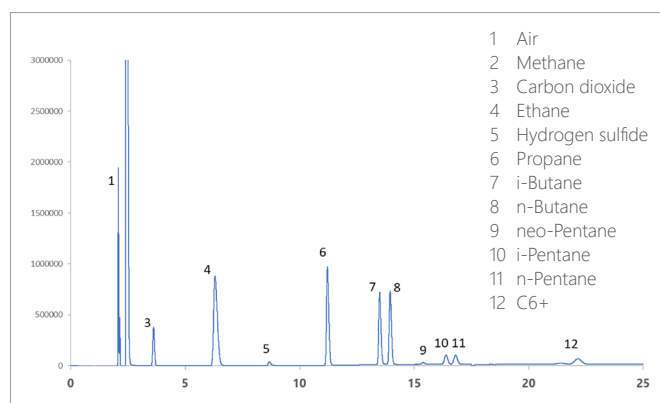
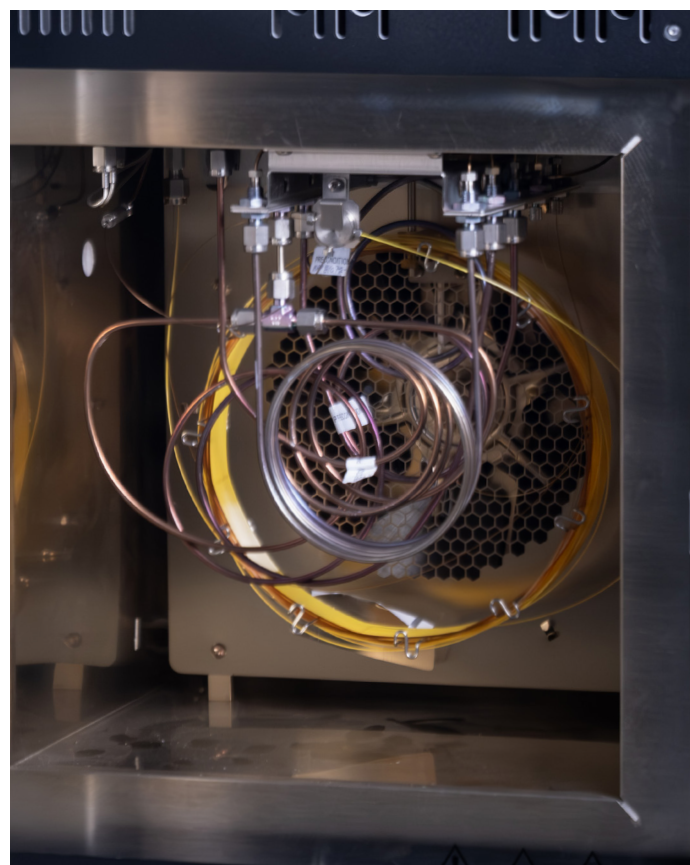


Figure 2: Chromatogram of natural gas sample from 'System A'.





NGA (System B)

For natural gas, the components of interest are typically oxygen, nitrogen, carbon dioxide, methane, ethane, propane, butane, isobutane, pentane, hydrogen sulfide, and C6+ as a composite peak.

The system is configured with a 10 and 12 port valve and three analytical columns connected to TCD and FID detectors. Results are shown in Figures 3 & 4. The system simultaneously injects the stream onto two packed columns, a Molsieve column for the determination of O₂ and N₂ without the use of coolants, and Non-Polar columns for the analysis of hydrocarbons and CO₂. The Non-Polar columns are set up for early back-flush, which optimizes sensitivity while reducing run time.

There are two standard upgrades available for the NGA-B. For the analysis of de-methanized liquefied natural gas distillates (i.e. propane, butanes and pentanes) an automated 4 port Liquid Sampling Valve or μ -gasifier. For the analysis of hydrogen and helium in natural gas the additional He/H₂ channel is available.

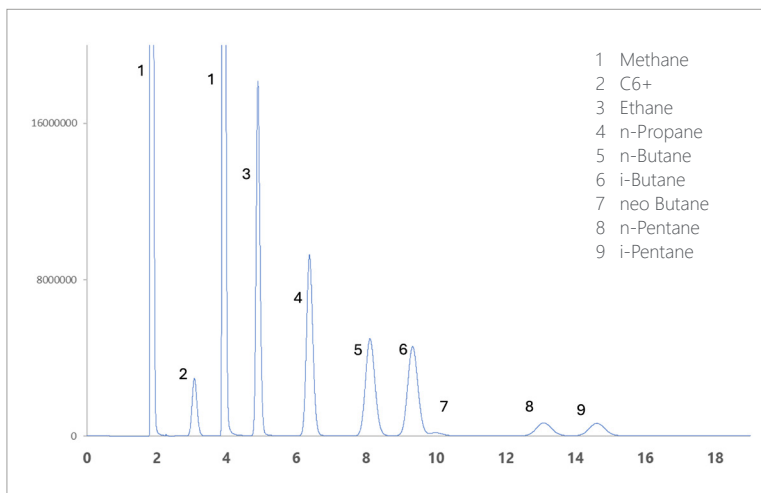


Figure 3: Chromatogram showing natural gas sample from 'System B' FID channel.

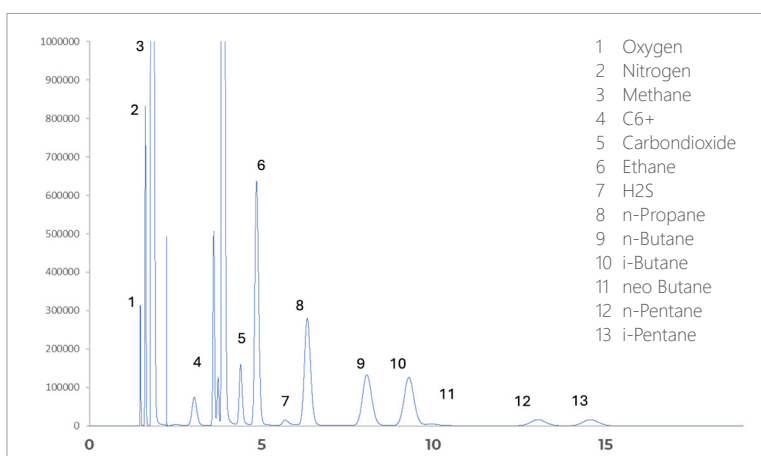


Figure 4: Chromatogram showing natural gas sample from 'system B' TCD channel.





NATURAL GAS ANALYSIS

NGA - Extended Analysis (System C)

This system is specifically designed to analyze natural gas or natural gas liquid streams for source evaluation. It is capable of separating all hydrocarbon components up to C16. As with System B, it separates and quantifies oxygen and nitrogen, as well as measuring hydrogen sulfide down to ~100 ppm.

The system is configured with a 14 port valve and 6 port valve. The 14 port valve enables the system to introduce the sample stream simultaneously to three independent columns with automated detector switching which provides high sensitivity detection of all components of interest. The valves are installed in the multi-valve oven for flexible operation of the conventional column oven. The NGA-C uses packed Molsieve and porous polymer columns as well as a high resolution capillary column, TCD and FID detection.

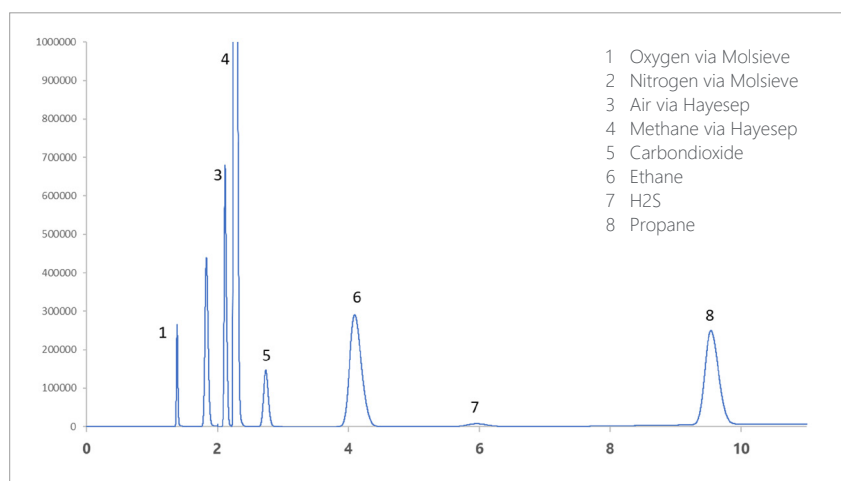


Figure 5: Chromatogram showing natural gas sample from 'system C' TCD channel.

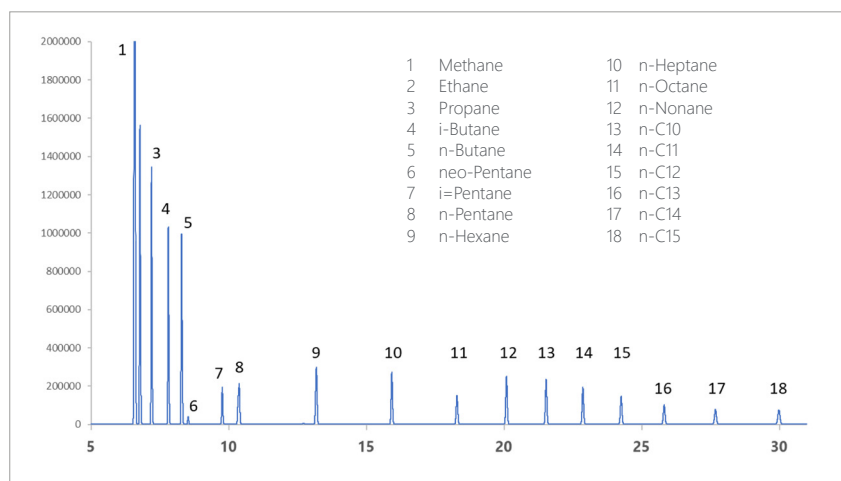


Figure 6: Chromatogram showing natural gas sample from 'System C' FID channel.
Note individual separation of C6+ components

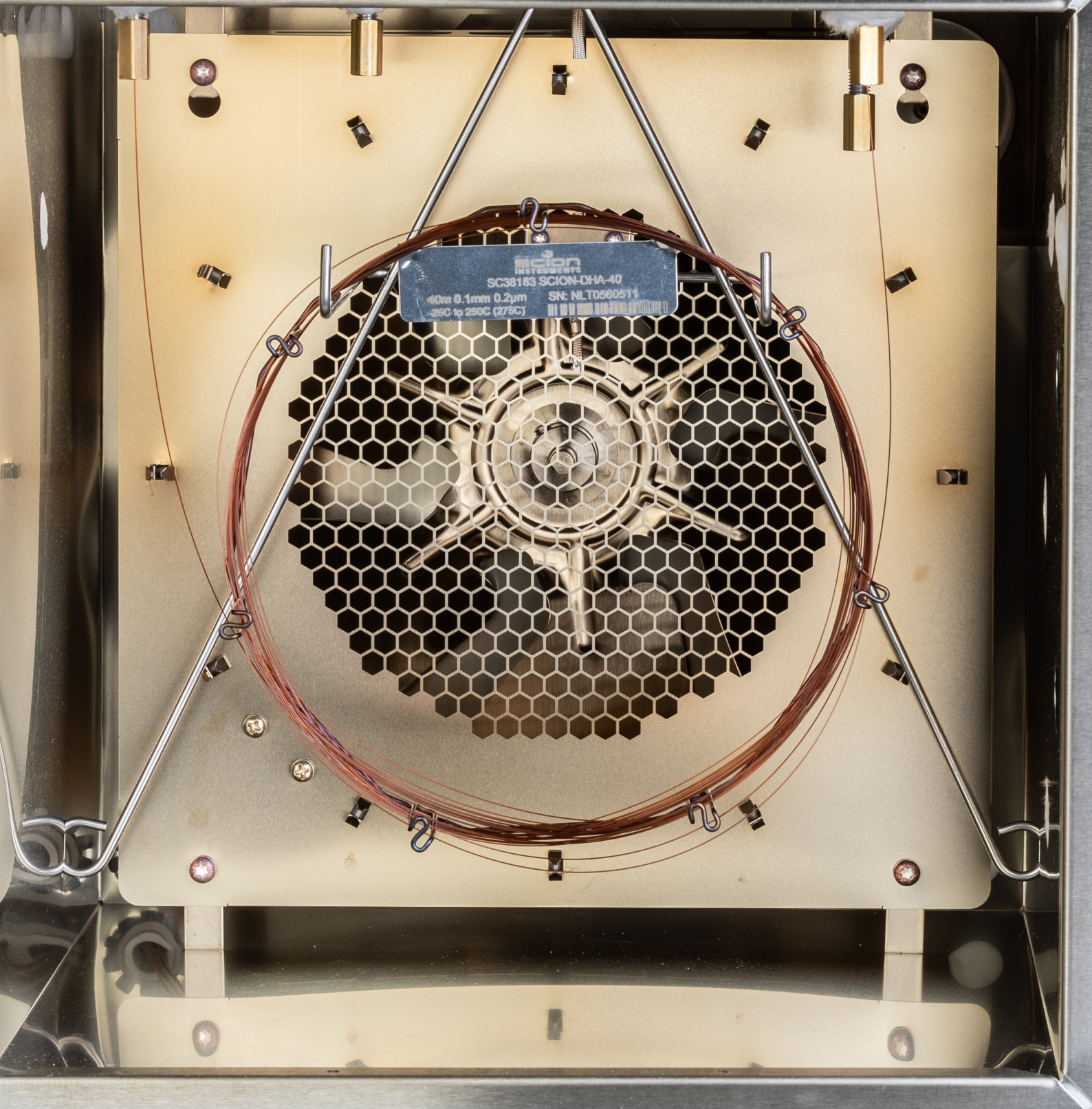


NATURAL GAS ANALYSIS - SUMMARY OF SPECIFICATIONS

Table 1. NGA Analyzer specifications and suitable standard methods.

	NGA-A	NGA-B	NGA-C
Specification			
O ₂ /N ₂ separation	No	Yes	Yes
Hydrocarbons separated up to	C6	C5	C16
C6+ backflush	Yes	Yes	Calculated
C7+ backflush	Yes	No	Calculated
H ₂ /He separation (via extra channel!)	Yes	Yes	Yes
LNG (requires LSV or gasifier)	Yes	Yes	Yes
Repeatability absolute %	<1	<1	<1
Analysis time (min)	30	14	15-20
Standard Method			
IP-345	Yes		
GPA 2103	Option		
GPA 2177	Option		
GPA 2261		Yes	
GPA 2286		Option	
GPA 2186		Option	Option
ASTM D1945		Option	
ASTM D5504		Option	
ASTM D6228		Option	
ISO 6974		Yes	
ISO 6975			Yes

Note: For all instances of 'Option' please contact the pre-sales office for assistance (pre-salesupport@scioninstruments.com).





EXTRAS IN NATURAL GAS ANALYSIS

THERE ARE SEVERAL METHODS SPECIFICALLY USED FOR THE ANALYSIS OF SULFUR COMPONENTS IN NATURAL GAS.

SCION's natural gas analyzers can be modified to measure sulfur components through the addition of an extra, fully inert channel, dedicated for the determination of low level sulfur components only.

This sulfur channel will be equipped with the Pulsed Flame Photometric Detector (PFPD) for D6228 or the Sulfur Chemiluminescence Detector (SCD) for D5504 or D6228. The systems can also be configured and tested exclusively for the analysis of sulfur components as per standard methods, or enterprise specific requirements.

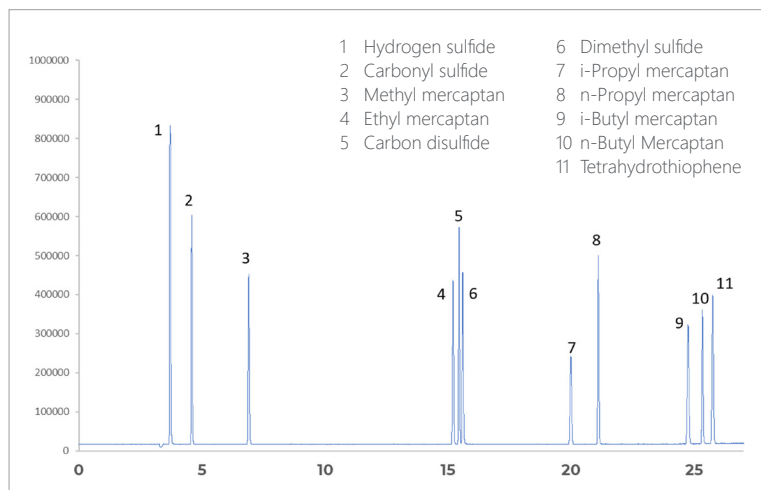


Figure 7: Detection of trace level sulfur components using the 8500 GC.

Calculation of physical properties

SCION natural gas analyzers provide the calculation of physical properties conform GPA 2145/2172, ASTM D3588 and ISO 6976 using special software linked to the CompassCDS chromatography data package.

Liquefied Natural Gas (LNG) analysis.

For the analysis of liquid natural gas the standard instrument configuration needs to be extended with a liquid sampling valve (LSV) or Gasifier.

SCION Instruments offer full customization and bespoke analyzers, configured to various sample types and methods. For more information contact pre-salesupport@scioninstruments.com



SCION-CERTIFIED CONSUMABLES FOR YOUR SCION GC



SCION GC Columns

SCION GC columns span a broad range of column lengths, diameters, stationary phases, and materials including: Fused Silica (FS) and Inert Steel (IS). Ideal for either routine or research type analyses, SCION GC columns cover a wide range of applications and include:

- Standard WCOT (Wall Coated Open Tubular)
- Solid Stationary Phase PLOT (Porous Layer Open Tubular)
- Inert Steel Micro-Packed and Packed



Super Clean™ Gas Filters

SCION Gas Purification Systems have the range to satisfy your needs from individual to combination filters, from Ultra purity combined with Ultra capacity, to all in one solution kits. Innovative features designed into the product yield extensive benefits to the user.

- Ultra-high capacity for long life, less change and improved productivity
- High-purity output ensures 99.9999% Pure Gas
- "Quick connect" fittings for easy, leak-tight filter changes
- Glass internals prevent diffusion; plastic externally for safety
- Easy-to-read indicators for planned maintenance and improved up-time



NGA Spares and NGA Consumables Kits

NGA Spares Kit

The NGA Spares kit contains a selection of spare parts to keep the NGA Analyzer functional outside of routine service visits.

NGA Consumable Kit

The NGA Consumable kit contains a selection of consumables to cover general maintenance of the NGA Analyzer for a period of 2 years, without the requirement of a Service Engineer.





GC ORDERING INFORMATION

Ordering Information for the 8500 GC	Part Number	
Part	120V	230V
NGA-A	859973201	859973202
NGA-B	859973401	859973402
NGA-B with HeH ₂	859940267	859940268
NGA-C	859973601	859973602
NGA-C with HeH ₂	859940270	859940271
Gas calculation software with 1 licence	DP-PC-XX-GC-10	
Gas calculation software - 1 additional licence	DP-PC-XX-GC-11	
Spares & Consumables Kits	Part Number	
Spares Kit: Natural Gas A	4131822	
Spares Kit: Natural Gas B	4131823	
Spares Kit: Natural Gas C	4131824	
Consumable Kit: Natural Gas A	4131825	
Consumable Kit: Natural Gas B	4131826	
Consumable Kit: Natural Gas C	4131827	



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