

● SCION 456-GC

Specification Sheet

Dimensions and Weights

Size*: Height: 57 cm (22.5 in.)

Width: 66 cm (26.0 in.)

Depth: 56 cm (22.0 in.)

Weight*: 43 kg (95 lb)

* Typical values

Environmental Conditions

Operating temperatures: 10 ° C to 40 ° C.

Operating humidity (relative): 5 % to 95 %

Line voltage requirements: 120 V, 230 V (±10 % nominal)

Column Oven

Dimensions: 28 cm (w) x 20 cm (d) x 28 cm (h)

Temperature range:

- Ambient +4 ° C to 450 ° C
- Liquid N₂: -100 ° C to 450 ° C
- Liquid CO₂: -60 ° C to 450 ° C

Temperature program ramps/holds: 24/25

Maximum temperature ramp rate: 150 ° C/min for all voltages and 180 ° C/min with oven insert accessory

Cool down rate: 400 ° C to 50 ° C in 4.5 minutes

Temperature set-point resolution: 0.1 ° C

Ambient temperature reject <0.01°C change in oven for 1°C change in ambient temp

Retention time Repeatability <0.008% or < 0.0008 min, based on Pentadecane under temperature program conditions

Area repeatability < 1% RSD

General Specifications

Up to 9 EFC modules total, injector, detector and auxiliary

Optional backflush

GC Control:

- External events (digital output):
 - 8 standard
 - 8 optional, total 16
- Max number of timed events: 16
- Heated zones:
 - Standard 5
 - 4 optional, 9 total
- Two power outlets 24V (1A max. each)

Methods:

- Maximum stored internal methods: 50 (max. 30 alphanumeric characters)



Temperature Range (° C)	456-GC Rates (° C/min)
50 -70	150
70 - 115	95
115 - 175	70
175 - 300	45
300 - 450	30

Logging:

- Run log file (stored with the chromatogram when using CompassCDS)
- Error log file

Local Display:

- TFT full color screen
- WVGA resolution (800 x 480)
- Size 23 cm (9")

Local Control:

- Touch screen
- Hard keys

Languages:

- English, German, French, Spanish, Italian, Portuguese, Cyrillic, Kanji, Chinese (standard and traditional), Thai, Korean and Dutch.

Local automation:

- Method lines: 25
- Modes:
 - Infinite looping
 - Dual and duplicate injection

Communication

Ethernet: Protocol: TCP/IP

Data rate: 100 Mbps

Control: GC control and method parameters

Analog output (optional):

- Number of channels: 3
- Time programmable steps: 30
- Output software selectable (set individual):
 - 0-1 V (default)
 - 0-10 V

Synchronization signals with other devices and data systems:

- Ready in and out
- Start in and out

Data Handling and System Control:

- CompassCDS Chromatography Data System

Certifications

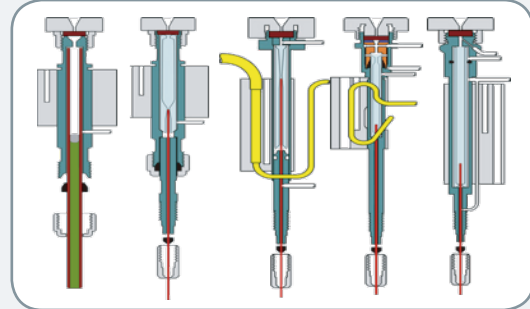
- CSA:
 - C22.2 61010-1
 - UL 61010-1
- IEC: 61010-1
- EMC:
 - 47 CFR part 15
 - ANSI C63.4
 - EN 61326

Injector Options

Maximum injectors: three, operating concurrently
Pneumatics: Electronic Flow Control (EFC), or manual
Injector types:

- S/SL Split/Splitless injector*
- PTV Programmable Temperature Vaporizing*
- COC Cold On-Column injector*
- Flash injector
- PWOC Packed/Wide bore On-Column injector

*Including septum purge



S/SL Split/Splitless Injector

Pressure range: 0-150 psi

Total flow:

- 500 mL/min for N₂/Ar
- 1500 mL/min for He/H₂

Maximum temperature: 450 ° C

Split range: 1-10,000 (column dependent)

Suited for columns:

- Wide bore: (0.53 mm)
- Narrow bore: (0.05 to 0.32 mm)

COC Cold On-Column Injector

Pressure range: 0-150 psi

Total Flow: 50 mL/min (Type 23 EFC)

Temperature range:

- Ambient +10 ° C to 450 ° C using air cooling
- -60 ° C to 450 ° C using liquid CO₂ cooling
- -160 ° C to 450 ° C using liquid N₂ cooling

Maximum temperature: 450 ° C

Maximum temperature ramp rate: 200 ° C/min

Temperature ramps/holds: 24/25

Suited for columns:

- Wide bore (0.53 mm)
- Narrow bore (0.32 mm)

PTV Programmable Temperature

Vaporizing Injector

Pressure range: 0-150 psi

Total flow:

- 500 mL/min for N₂/Ar
- 1500 ml/min for He/H₂

Temperature range:

- Ambient + 10 ° C to 450 ° C using air cooling
- -160 ° C to 450 ° C using liquid N₂ cooling
- -60 ° C to 450 ° C using liquid CO₂ cooling

Maximum temperature ramp rate: 200 ° C/min

Temperature ramps/holds: 24/25

Split range: 1-10,000 (column dependent)

Operational capabilities:

- Large volume injection
- Temperature ramped splitless
- Cold on-column
- Split and splitless
- ChromatoProbe solid sample introduction optional

Suited for columns:

- Wide bore (0.53 mm)
- Narrow bore (0.05 to 0.32 mm)

Maximum injection volume: 250 μ L (LVI mode)

Flash Injector

Pressure range: 0-150 psi

Total flow:

- 50 mL/min (Type 23 EFC)

Maximum temperature: 450 ° C

Suited for columns:

- Wide bore (0.53 mm)
- Packed (1/8" to 1/4")

PWOC Packed/Wide-bore On-Column Injector

Pressure range: 0-150 psi

Total flow:

- 50 mL/min (Type 23 EFC)

Maximum temperature: 450 ° C

Suited for columns:

- Wide bore (0.53 mm)
- Packed (1/8" to 1/4")

Electronic Flow Control: Injectors (EFC)

Module types: 4 injector-specific modules

Pressure: 0.1 % Full Scale

Resolution pressure set points is 0.001psi

Flow sensor accuracy 2% of measured or 0.2% of full scale

Flow sensor repeatability 0.5%

Sample Preconcentration Trap (SPT)

Trace level analysis of volatiles in gases

Fully integrated

Temperature range:

- -60 ° C to 450 ° C using liquid CO₂ cooling
- -185 ° C to 450 ° C using liquid N₂ cooling

Temperature rate:

- Ballistic for instant release of adsorbed volatiles

Available traps:

- Two lengths
- A wide range of standard packings and custom packings

Quick-Switch Valve Option

Instantly switch between injectors/columns and detectors
Configurations: automated or manual, factory or field installed

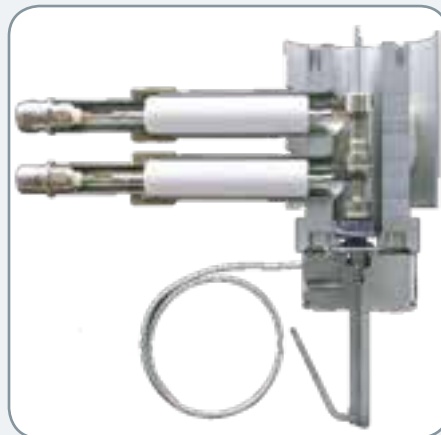
Detector Options

Maximum detectors: four: operating concurrently (one of which is a Single or Triple Quad MS)
Pneumatics: Electronic Flow Control (DEFC) or manual

Detector types:

- FID Flame Ionization Detector
- TCD Thermal Conductivity Detector
- ECD Electron Capture Detector
- NPD (TSD) Nitrogen-Phosphorus Detector
- PFPD Pulsed Flame Photometric Detector
- PDHID Pulsed Discharge Helium Ionization Detector
- MS Mass Spectrometry (see GC/MS brochure and datasheet)

Note: Data Acquisition Rate : 600Hz for all detectors, exception is the PFPD



FID Flame Ionization Detector

Maximum temperature: 450 ° C
Detectivity: 1.4 pg C/sec
Linear dynamic range: 10⁷

Flame tip type: ceramic (patented)

Operational quality:

- Flame-out detection
- Auto re-ignition

TCD Thermal Conductivity Detector

Maximum temperature: 450 ° C
Detectivity: 300 pg/mL (Butane)
Linear dynamic range: 10⁶

Operational quality:

- Filament protection
- Automatic bridge balancing

ECD Electron Capture Detector

Maximum temperature: 450 ° C
Detectivity: 7 fg/sec Lindane
Linear dynamic range: 10⁴
Radioactive source: 63Ni - 15 mCi (555 Mbq)

NPD (TSD) Nitrogen-Phosphorus Detector

Maximum temperature: 450 ° C
Detectivity:
N: 100 fg N/sec (Azobenzene)
P: 100 fg P/sec (Malathion)

Linear dynamic range:

- N: 10⁵
- P: 10⁴

Operational quality: self-aligning bead

PFPD Pulsed Flame Photometric Detector

Photomultiplier tube:

- S/P
- S/P/N

Maximum temperature: 450 ° C

Detectivity:

- S: 1 pg S/sec (S/P tube)
- P: 100 fg P/sec (S/P tube)
- N: 20 pg N/sec (S/P/N tube)

Linear dynamic range:

- S: 10³
- P: 10⁴
- N: 10²

Up to 23 elements can be detected

PDHID Pulsed Discharge Helium Ionization Detector

Detectivity: 50 ppb (Methane)

Linear dynamic range: 10⁴(Methane)

Operational quality:

- Gold plated connections
- Welded column connections

Detectors (DEFC)

Module types: 6 detector-specific modules

Accuracy: ± 7 % set point flow

Resolution: 0.1 or 1 mL/min

Automation Options

CP-8410 Auto Injector

Sample capacity:

- 10 x 2 mL vials
- 6 x 5 mL vials
- 5 x 10 mL vials

Large solvent wash vial: 2 x 120 mL*

Dual and duplicate mode

Internal standard addition

Modes of operation:

- Liquid
- Ambient headspace*
- SPME (Solid Phase MicroExtraction)*
- Sample heating and cooling*

Pre-programmed modes of injection Syringes:

- 1 µL, 2 µL, 5 µL, 10 µL, 100 µL, 250 µL for liquid injection
- SPME

CP-8400 AutoSampler

Sample capacity: 100 x 2 mL vials
Large solvent wash vial: 2 x 120 mL*
Dual and duplicate mode
Internal standard addition

Modes of operation:

- Liquid
- Ambient headspace*
- SPME*
- Sample heating and cooling*

Pre-programmed modes of injection syringes:

- 1 μ L, 2 μ L, 5 μ L, 10 μ L, 100 μ L, 250 μ L for liquid injection
- SPME

* Optional

PAL Combi-xt AutoSampler

Sample trays: two standard and expandable to four

Tray types:

- 98 x 2 mL vials
- 200 x 1 mL vials
- 32 x 10 mL/20 mL vials
- 96-well plates

Dual and duplicate mode

Internal standard addition

Modes of operation:

- Liquid
- Heated headspace*
- SPME*
- ITEX*

Sample heating and cooling

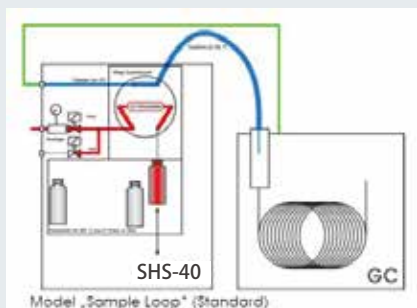
Additional optional modules: further sample trays, micro-well plate holders, wash station, SPME fiber bake-out station, dilutor, barcode readers, and flowcell

* Optional

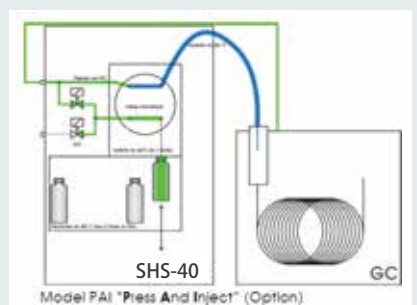


SHS-40 Headspace Sampler

Fixed Sample Volume Configuration



Press and Inject Configuration



System Features

Sample Capacity	Up to 40 vials; 20mL or 10 mL w/adaptor Crimp or Screw Top Vials
Injection Modes	Fixed Sample Volume Press and Inject
Injection Valve	6 Way Electric Actuated 1 mL Sample Loop Heat up to 350° C
Incubator	Up to 12 Samples 40-200° C in 1° C increments Integrated Shaker
Instrument Control	Remote with Compass CDS Stand alone
Sample Recognition and Detection	Automated
Carrier Gas Control	Direct from GC
Optional Accessories	Additional Sampling Valve Reactant Gas Catalytic Converter

- Sample Capacity: 40 x 20ml (10ml vials with adaptors).
- Fully integrated
- Sample path inert
- Automated vial queuing system
- Automated Gas Sampling Valve- Electric actuated 6-way injection valve (VICI) with 1 ml sample loop. This entire module may be separately heated up to 350° C.
- Heated incubation oven for 12 samples (40° C - 200° C, in 1° C-steps)
- Integrated Shaker
- Automatic sample detection/recognition
- Compatible with Crimp and Screw Top Vials
- Carrier gas controlled direct from the GC
- AUX gas pre-set internally.
- Up to 9 different parameter sets can be stored.
- Adaptable to different injectors
- Multiple Headspace Extraction mode via single puncture
- Flexible transfer line
- Option: Sample Transfer Line Kit (direct connection to carrier gas, insertion of transfer line via injector no longer required)
- Control: Stand alone or remotely via Compass CDS software
- Voltage: 110V or 230V
- Dimensions: Width: 29cm (12in) Height: 46cm (18in) Depth: 62cm (25in)
- Weight: 21kg (47lb)