

## Specification sheet

# SCION 456-GC

## 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 N<sub>2</sub>: -100 °C to 450 °C
- Liquid CO<sub>2</sub>: -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)	With Oven Insert
50 - 70	150	180
70 - 115	95	115
115 - 175	70	90
175 - 300	45	65
300 - 450	30	45

**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

**Synchronisation 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
- EC: 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 Vaporising\*
- 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 N<sub>2</sub>/Ar

1500 mL/min for He/H<sub>2</sub>

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 ° using air cooling
- -60 °C to 450 °C using liquid CO<sub>2</sub> cooling
- -160 °C to 450 °C using liquid N<sub>2</sub> 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

Vaporising Injector

Pressure range: 0-150 psi

#### Total flow:

• 500 mL/min for N<sub>2</sub>/Ar

• 1500 mL/min for He/H<sub>2</sub>

#### Temperature range:

- Ambient + 10 °C to 450 °C using air cooling
- -160 °C to 450 °C using liquid N<sub>2</sub> cooling
- -60 °C to 450 °C using liquid CO<sub>2</sub> 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 µL (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 0.001 psi

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 CO<sub>2</sub> cooling
- -185 °C to 450 °C using liquid N<sub>2</sub> 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 MS or external Detector)

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 Ionisation Detector

Maximum temperature: 450 °C

Detectivity: 1.4 pg C/sec

Linear dynamic range: 10<sup>7</sup>

### 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: 10<sup>6</sup>

### Operational quality:

- Filament protection
- Automatic bridge balancing

### ECD Electron Capture Detector

Maximum temperature: 450 °C

Detectivity: 7 fg/sec Lindane

Linear dynamic range: 10<sup>4</sup>

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: 10<sup>5</sup>

P: 10<sup>4</sup>

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: 10<sup>3</sup>

P: 10<sup>4</sup>

N: 10<sup>2</sup>

Up to 23 elements can be detected

## PDHID Pulsed Discharge Helium Ionisation Detector

Detectivity: 50 ppb (Methane)

Linear dynamic range: 10<sup>4</sup> (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 µL, 2 µL, 5 µL, 10 µL, 100 µL, 250 µL 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

