

# Heat Value Gas Chromatograph

## Model HGC303

### OVERVIEW

The model HGC303 is the world smallest gas chromatograph, which is capable of analyzing 11 different components of natural gas and digitally publishing the derived parameters, such as calorific value, Wobbe-index, or density.

By using our leading sensing & control technology, we designed the model HGC303 specifically for custody transfer, quality control, and other natural gas applications to meet the demands of the expanding natural gas market.

The model HGC303's size, weight, cost and other great features gives the user the benefits of functionality, flexibility and economy from the production site to the pipe line station to the gas distributor and onto the end user's station.



### FEATURES

#### **Small size for easy field installation**

The model HGC303 has a compact design thus facilitating field installation. In addition, the device can be mounted with a sampling system in the field.

- Small compact packaging
- No analyzer house is required
- Flameproof certified

#### **Pre-engineered analysis and calculations for Natural Gas Metering**

The model HGC303 has pre-engineered analysis and calculations for Natural Gas Metering so that no additional programming or application work is required.

- Easy to set up straight out of the box
- Analysis of 11 components and pre-configured value calculations
- Analysis and calculations based on international standards

#### **Digital communication for system integration**

The model HGC303 is capable of supporting MODBUS protocols with optional analog output capabilities and has been tested with leading flow computers.

#### **PC monitoring and online diagnostics**

The Heat Value Gas Chromatograph Monitor (HGM) is a PC-based software that allows the user to view all data and diagnostic information from a laptop computer.

### ADVANTAGES

#### **Simple to start-up and easy to maintain**

A huge amount of time and cost in the analyzer system start up phase can be saved with the model HGC303's unique packaging and pre-engineered functions.

The unit's easy-to-maintain design contributes to time and cost savings and it can be repaired without the need for analyzer expertise.

**FUNCTIONAL SPECIFICATIONS****Principle of measurement**

Gas chromatography

**Measured gas streams**

1

**Analyzed components**

11

**Analysis time**

300 sec.

**Detector**

Micro TCD (Thermal Conductivity Detector)

**Chromatographic method**

ISO 6974, part 4

**Heat value calculation method**

ISO 6976

**Gas to be analyzed**

Natural gas

**Component measuring ranges and minimum detection**

Components	Ranges (mol%)	Minimum detection (mol%)
Sum of C6+	0-0.3	0.01
C3H8 (propane)	0-3	0.05
i-C4H10 (i-butane)	0-1	0.01
n-C4H10 (n-butane)	0-1	0.01
neo-C5H12 (neo-pentane)	0-0.5	0.01
i-C5H12 (i-pentane)	0-0.5	0.01
n-C5H12 (n-pentane)	0-0.5	0.01
N2 (nitrogen)	0-20	0.1
CH4 (methane)	50-100	-
CO2 (carbon dioxide)	0-10	0.05
C2H6 (ethane)	0-15	0.05

**Analyzer outputs**

PV1	C6+ (sum of C6+)
PV2	C3H8 (propane)
PV3	i-C4H10 (i-butane)
PV4	n-C4H10 (n-butane)
PV5	neo-C5H12 (neo-pentane)
PV6	i-C5H12 (i-pentane)
PV7	n-C5H12 (n-pentane)
PV8	N2 (nitrogen)
PV9	CH4 (methane)
PV10	CO2 (carbon dioxide)
PV11	C2H6 (ethane)
PV12	SCV (real) (MJ/m <sup>3</sup> ) [default] or SCV (ideal) (MJ/m <sup>3</sup> ) or ICV (real) (MJ/m <sup>3</sup> ) or ICV (ideal) (MJ/m <sup>3</sup> )
PV13	Density (real) (kg/m <sup>3</sup> ) [default] or Density (ideal) (kg/m <sup>3</sup> ) or Relative density (real) or Relative density (ideal)
PV14	Wobbe index (real) (MJ/m <sup>3</sup> ) [default] or Wobbe index (ideal) (MJ/m <sup>3</sup> )
PV15	Compressibility factor
PV16	Total of raw concentrations
PV17	Oven temperature
PV18	Carrier gas pressure
PV19	ICV (real) (MJ/m <sup>3</sup> ) [default] or ICV (ideal) (MJ/m <sup>3</sup> )
PV20	Relative density (real) [default] or Relative density (ideal)

**Auto-calibration**

External solenoid valve and HMU contact are required.

**Normalization of concentrations****On-line diagnostics****Hazardous area certification**

ISSEP/CENELEC ATEX certifications: II 2 GD EEx d IIC T6 IP65

**Process Gas****Temperature**

-10°C to 50°C

**Flow rate**

50 ± 20ml/min

**Dust and mist**

None

**Moisture**

Less than 2000 ppm

**Coexisting components limit**

H<sub>2</sub> < 0.1 mol%

He < 0.1 mol%

Oxygen < 0.1 mol%

H<sub>2</sub>S (dry) < 0.1 mol%

**Ambient temperature limits**

-10°C to 50°C

-40°C to 70°C for storage and transportation

**Ambient humidity Range**

0-95%RH

**CE marking**

Electromagnetic compatibility (EMC)

(89/336/EEC, 92/31/EC, 93/68/EEC)

Equipment explosive atmospheres (ATEX): 94/9/EC

**PERFORMANCE SPECIFICATIONS****Repeatability of analysis**

± 0.05% CV

**PHYSICAL SPECIFICATIONS****Color**

Metallic light green, silver

**Material****Body**

Cast aluminum

**Oven**

Cast aluminum

**Wet-parts**

304 Stainless steel, polyimide

**Sensor**

Pt, glass, gold

**Dimensions**

W: 100 mm × D: 115 mm × H: 244 mm

**Weight**

3.5kg

## COMMUNICATIONS

The model HGC303 communicates to a PC for configuration, maintenance and data transmission. PC and HGC bus connections are provided as standard equipment.

A specific Windows-based model HGC303 software, the HGC Monitor HGM, enables convenient model HGC303 instrument control in a user-friendly environment. Retransmission of data to the central system can be performed via the Internet. Modbus communication is also available for networking with, for example, a flow computer or SCADA system.



## INSTALLATION

### Mounting

Vertical 2 in. pipe mount

### Power supply

24V DC ± 15% 4A min

### Power consumption

5~50VA at -10°C to 50°C

### Utilities

#### Carrier gas: Helium

##### Purity

99.99% or higher

##### Pressure

400 kPa ± 50 kPa

##### Consumption

25ml/min (approximately)

#### Instrument air (for actuating the valve)

##### Pressure

400 kPa ± 50 kPa

#### Environmental classification

Sheltered location (protected from sunlight or precipitation)

**MODEL SELECTION**

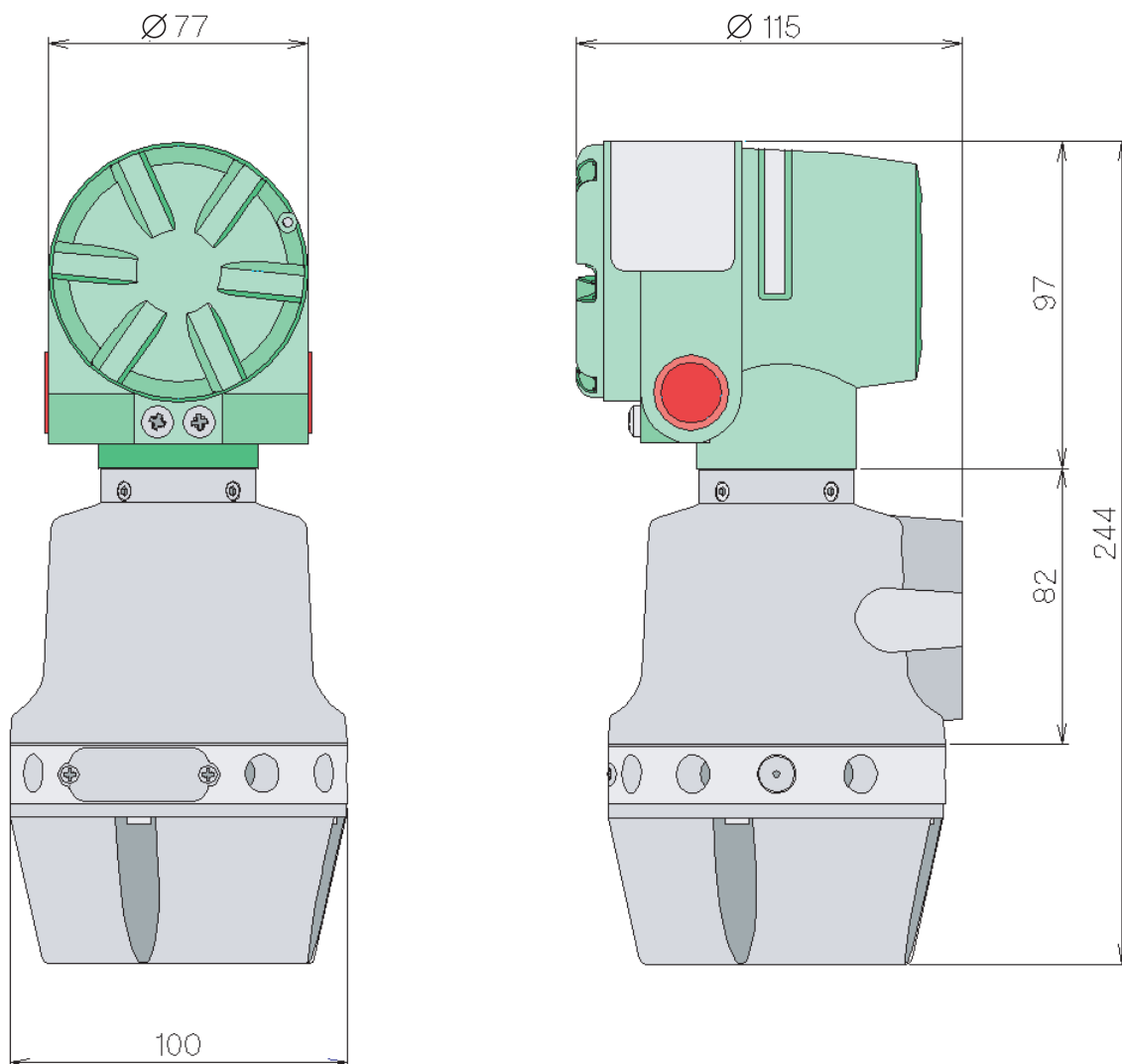
**Heat Value Gas Chromatograph**  
HGC303 - I II

Basic Model No.	HGC303-
-----------------	---------

I	Conduit entry	1/2 NPT	1	
	Gas connection	1/4 NPT		
II	Explosion-protection	ISSeP/CENELEC Flameproof		E

**DIMENSIONS**

[Unit: mm]



# Note



## Yamatake Corporation

Totate international Building  
2-12-19 Shibuya  
Shibuya-ku, Tokyo 150-8316  
Japan

*Tel : 81-3-3486-2310*

*Fax : 81-3-3486-2593*

**YAMATAKE**  
**Savemation**

*Saving through Automation*