Heat Value Gas Chromatograph

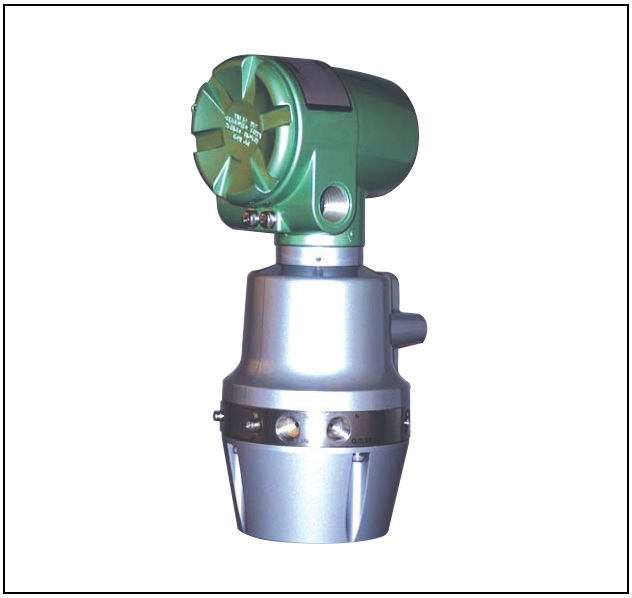
Model HGC303

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^3) [default] or SCV (ideal) (MJ/m^3) or ICV (real) (MJ/m^3) or ICV (ideal) (MJ/m^3)
PV13	Density (real) (kg/m^3) [default] or Density (ideal) (kg/m^3) or Relative density (real) or Relative density (ideal)
PV14	Wobbe index (real) (MJ/m^3) [default] or Wobbe index (ideal) (MJ/m^3)
PV15	Compressibility factor
PV16	Total of raw concentrations
PV17	Oven temperature
PV18	Carrier gas pressure
PV19	ICV (real) (MJ/m^3) [default] or ICV (ideal) (MJ/m^3)
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
H2 < 0.1 mol%
He < 0.1 mol%
Oxygen < 0.1 mol%
H2S (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

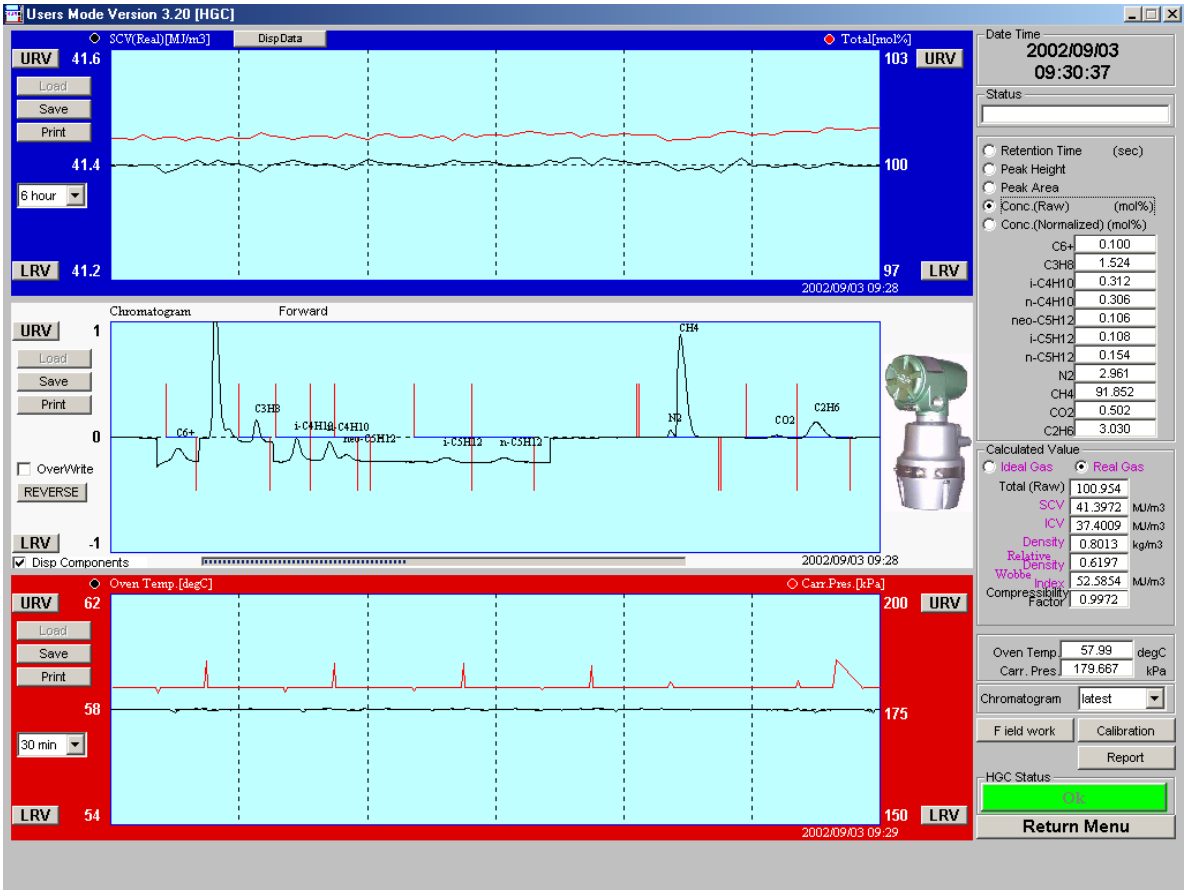
Sensor
Pt, glass, gold

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

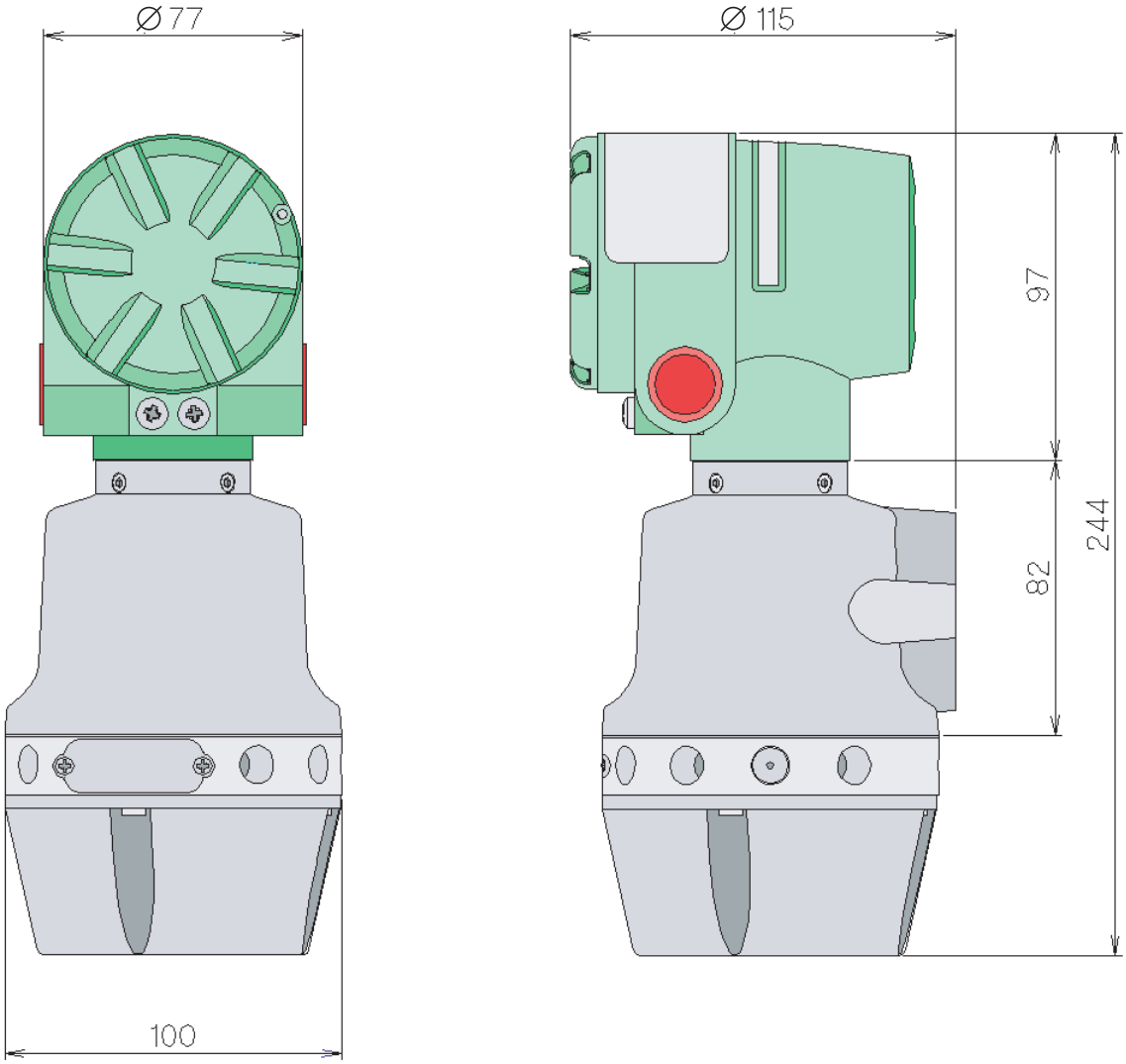
HGC303 - I II

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

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Saving through Automation

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