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

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

### 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/m³) [default]                     |
|      | or SCV (ideal) (MJ/m³)                           |
|      | or ICV (real) (MJ/m³)                            |
|      | or ICV (ideal) (MJ/m³)                           |
| PV13 | Density (real) (kg/m³) [default]                 |
|      | or Density (ideal) (kg/m³)                       |
|      | or Relative density (real)                       |
|      | or Relative density (ideal)                      |
| PV14 | Wobbe index (real) (MJ/m³) [default]             |
|      | or Wobbe index (ideal) (MJ/m³)                   |
| PV15 | Compressibility factor                           |
| PV16 | Total of raw concentrations                      |
| PV17 | Oven temperature                                 |
| PV18 | Carrier gas pressure                             |
| PV19 | ICV (real) (MJ/m³) [default]                     |
|      | or ICV (ideal) (MJ/m³)                           |
| 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

<table>
<thead>
<tr>
<th>Basic Model No.</th>
<th>HGC303-</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>Conduit entry</td>
</tr>
<tr>
<td></td>
<td>Gas connection</td>
</tr>
<tr>
<td>II</td>
<td>Explosion-protection</td>
</tr>
</tbody>
</table>

DIMENSIONS

[Unit: mm]
Note