

Natural Gas Analysis System – NGAS 11
with Yamatake HGC 303 Gaschromatograph

Documentation and Technical Specifications





Cabinet dimensions (Width x Depth x Height) 1200 x 450 x 1560 mm

Vemm tec have designed a comprehensive solution for a high quality natural gas component analysis and heating value (BTU) calculation. This compact unit is a complete solution for indoor and outdoor installation and contains all components required for a high quality measurement. You just plug in the gas sample line, the power supply and eventual data communication lines, all the rest is included in this turn key solution for your natural gas analysis.

Advantages

- complete, ready to go, turn key system
- inclusive all installation material, cables (power and signal) and sample gas probe and piping.
- inclusive calibration and carrier gas bottles (opt.)
- full automatic control
- 300 seconds analysis time
- auto-calibration (daily)
- approved for legal heating value determination
- chromatographic method after ISO 6974 part 4
- heating value determination after ISO 6976
- PTB approval
- one or two sample gas stream(s)

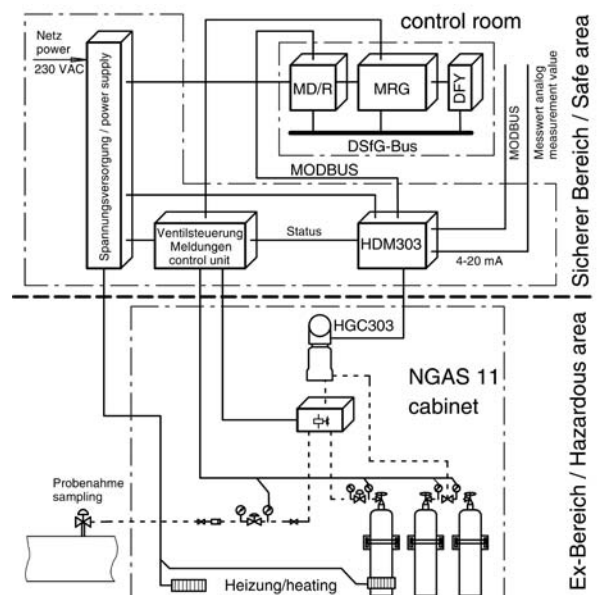
Calculated values of heating value and components of Natural gas

- measures up to 11 components of natural gas
- lower and upper heating value gas density (base density and relative density)
- wobbe index
- compressibility

Applications

- natural gas transportation grids
- natural gas distribution grids
- natural gas compressor stations
- natural gas storage site, caverns
- power stations with natural gas fuel supply (efficiency optimization)
- industrial applications for feedstock and
- gas fired combustion installations

Wiring



Sicherer Bereich / Safe area
Ex-Bereich / Hazardous area

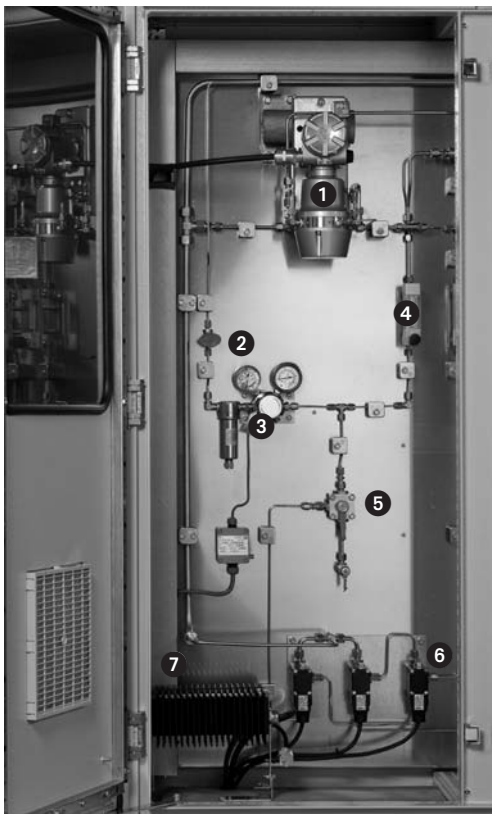
Gas bottle side

- pressure regulators for calibration and carrier gas
- monitoring of cal. gas and carrier gas pressure
- two carrier gas bottles with automatic carrier gas switching to increase availability
- safety shutoff valve



- ① carrier gas
- ② calibration gas

Analysis side



- ① PGC HGC 303, legal custody measurement, measurement of 11 natural gas components, gas analysis time only 300 seconds
- ② block valve
- ③ sample flow pressure regulation, pressure monitoring and flush operations
- ④ sample flow indicator
- ⑤ additional external test gas hook up
- ⑥ solenoid valves for automatic control of measurement- and calibration cycles
- ⑦ heating block to ensure acceptable operating conditions

Control and monitoring electronics in 19" rack mount 3HE



One power supply module or two power supply modules (230 Volt, other optional), Fuse box, Separation PCB, Pt100 temperature limit control, barrier and amplification groups controller. Alarm and attention signal are potential free contacts.

Following alarms and warnings can be generated:

- PGC failure
- P lo limit alarm for carrier gas 1, 2 and calibration gas
- P lo limit for sample gas
- temperature hi limit in cabinet
- temperature lo limit in cabinet

Technical data of the Control unit

- power supply 220...240 VAC (others optional available) 48...62 Hz
- cabinet operational temperature range 0...60 degC
- protection class IP 20
- relative Humidity < 90%
- power consumption ca 100 VA (inclusive PGC)

Technical data of the NGAS11

- heater capacity for cabinet 500 W (starting at 15 deg C)
- heater capacity for cal. gas 80 W (starting at 40 deg C)
- optional heater for the 100 W sample flow pressure regulation (starting at 20 deg C)

The heaters capacity as well as the electrical isolation of the cabinet must be adapted to the local conditions.

Optionally additional data gateway or data storage modules can be integrated. A second 19" rack will be required that includes measuring data storage (up to 14 month), DSfG data protocol (also interface protocol to some brands of flow computer) complete with MODBUS/DSFG convertor, DFY remote data transfer. These options add about 50 VA power consumption.

For option diagram see backside

Table 1: Technical Specification PGC HGC303 (extract)

Ranges of gas components	Operating Range (mol %)	min. Detection (mol %)	Technical Data	
Sum C ₆ +	0 – 0.3	0.01	Ambient temperature	-10...+50 °C
C ₃ H ₈ (Propane)	0 – 3	0.05	Operational temperature	-20...+60 °C
i-C ₄ H ₁₀ 0 (i-Butane)	0 – 1	0.01	Max relative humidity	max. 90 %
n-C ₄ H ₁₀ 0 (n-Butane)	0 – 1	0.01	Protection class	IP 65
neo-C ₅ H ₁₂ (Neo-Pentane)	0 – 0.5	0.01	Explosion protection	EEx d IIC T6
i-C ₅ H ₁₂ (i-Pentane)	0 – 0.5	0.01	Power supply HGC303	24 VDC ≥ 4A
n-C ₅ H ₁₂ (n-Pentane)	0 – 0.5	0.01	Output signals: – Foundation Fieldbus (-optional DSfG) – Modbus RTU o. ASCII via RS-232, 485, 422 – Analog 4...20 mA (1x)	
N ₂ (Nitrogen)	0 – 20	0.1		
CH ₄ (Methane)	50 – 100	–		
CO ₂ (Carbon-dioxide)	0 – 10	0.05		
C ₂ H ₆ (Ethane)	0 – 15	0.05	Carrier gas Helium	He ≥ 99,99%
			Carrier gas consumption	≈ 25 ml/min
Coexisting component limits:				
H ₂ , He, O ₂ , H ₂ S (dry) - each		< 0.1 mol%	Repeatability of heating value over the full temp. range	+/- 0,1%
Moisture		< 2000 ppm	Repeatability of heating value at constant operating temperature	+/- 0,025 %

Table 2: NGAS option diagram

MODEL NGAS 11	I	II	III	IV	V	VI	VII
container L 600 x W450 x H1560	•	•					
container L1200 x W450 x H1560			•	•	•	•	•
chromatograph HGC303	•	•	•	•	•	•	•
standard data output and storage HDM303	•		•				
19" rackmount control panel *		•		•	•	•	•
digital data interface with DSfG protocol							•
integrated sample gas pressure reduction	•	•	•	•	•	•	•
manual calibration gas injection	•		•				
automatic sample and cal. gas switching manifold		•		•	•	•	•
bottle rack for He and cal. gas with automatic switching					•	•	•
bottle rack for He and cal. gas without automatic switching			•	•			
temperature and pressure monitoring						•	•
PTB approval							•

* as standard + auto calibration controls + pres. and temp. control (optional) + other data links (optional)



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