GAS 3200WM BIOGAS ANALYSER

Compact Wall-mount system for continuous or sequential analysis of biogas

Typical Biogas applications

- Landfill gas recovery plants
- Anaerobic digestion of municipal wastes
- Industrial biogas plants
- Agricultural (farm) biogas plants
- Waste Water Treatment (WWT) plants
- Sludge digesters
- Bio diesel plants
- Desulphurisation installations
- Cogeneration (CHP) plants
- Biomethane production (fuel or grid)
- Fuel cell applications

Non contractual document; pictures and specifications are subject to change without prior notification - Issue -EN15v0

General presentation

GAS 3200WM BIOGAS analyser for indoor or outdoor wall-mount installation offers a complete and compact continue or sequential biogas analysis solution with, depending on the requested configuration, the measures of CH_4, CO_2 and O_2 in % volume, and H_2S and H_2 in ppm range.

The IP66 cabinet in reinforced polyester (IP65 stainless steel in option) with windowed front lockable door integrates gas sampling and pre-treatment equipment and the analyser.

Installation

If installed outside, GAS 3200WM BIOGAS shall be placed under a canopy to protect it against rain, wind, snow deposit and direct sunlight radiations. The heating unit with blower and PT100 probe regulates the inside temperature of the cabinet at +8°C enabling outdoor installation at Tamb down to -25°C.

The GAS 3200WM BIOGAS is delivered "ready for use", only electrical and pneumatic connections need to be done on site.

Gas pre-treatment

Gas sampling and pre-treatment equipment are customizable to best suit the biogas quality, ambient and system operating conditions:

- Continue analysis on one single sampling point
- Upstream (H_2S) and downstream (biogas) continue analysis on a desulfurization unit.
- Sequential analysis on maximum 4 sampling points.

Safety

The analyser is not designed for use in hazardous areas but gas inlet and outlet ports have Flashback Arrestors according to EN-1874.

The optional increased safety protection with Ex-proof internal CH_4 leak detection + forced ventilation (± 160 air renewal/hour) and standard gas inlet solenoid valve(s) enable to declassify an hazardous area.

Communication

Standard: analogue outputs 4-20mA for gas measures

Option for real time measures & system status transfer to remote PC or DCS:

- Continue analysis on a single sampling point: Ethernet/TCP-IP COM
- Sequential analysis on multiple sampling points: Profinet (Ethernet) COM
- SCADA supervision software for installation on a remote PC.

Gas Detection and Analysis
Industrial Processes Gas Monitoring
Landfill & Environmental Gas Monitoring

GEIT
Gas Engineering and Instrumentation Technologies Europe

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Components of the GAS 3200 WM BIOGAS Analyser

1	GAS 3200 R BIOGAS analyser
2	AIO terminals (4-20mA) + RS232
3	DIO 1 terminal (relay contacts)
4	DIO 2 terminal (reserve)
5	Power circuit breaker 220 VAC-50hz
6	Diaphragm gas sampling pump 4-5L/min or Pressure reducer/regulation (for pressurized biogas)
7	By-pass flowmeter gas sampling pump
8	Flow indicator gas sample (1L/min)
9	1- or 2-path Peltier gas cooler (gas dew point +4°C)
10	Peristaltic pumps
11	Coalescing Filter with 2µm filter element
12	Safety filter with 0.1µm filter element
13	Charcoal filter on zero air inlet of gas analyser
14	Gas inlet/outlet ports with flame arrestor
15	Manual valves for measure/calibration selection
16	Stainless steel cable gland for 4-20mA outputs
17	Stainless steel cable gland for power supply
Optional	
Stainless steel AISI 316 cabinet, IP65	
Internal heater for outdoor installation	
Increased safety protection of the cabinet	
Water detector on safety filter	
H_2S scrubber filter on gas outlet	
PLC controlled sequential analysis on max. 4 sampling points	

Mechanical

- Wall-mount execution for indoor or outdoor[(1)] installation
- Material: reinforced Polyester (IP66) or stainless steel (optional, IP65)
- Dimensions: H 835 mm x W 635 mm x D 300 mm
- Weight = 40-50 kg, depending on configuration, without packaging
- 4 brackets for wall mounting
- Hinged front door with window and handle with lock
- Upper compartment for gas analyzer
- Lateral air intake for natural or forced ventilation
- Stainless steel connectors for gas, calibration, air and drain ports

Environmental conditions

- Operating temperature range: 5 to +45°C (-25°C with optional heater)
- Operating humidity range : 0-95% RH non condensing
- Operating pressure range : 800-1200 hPa

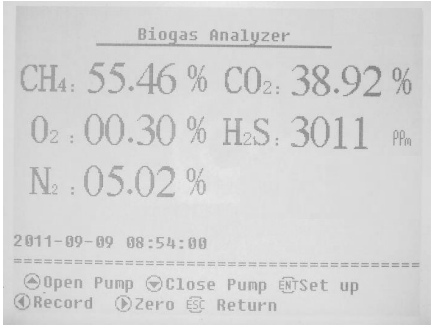
Non contractual presentation (optional St-St version)

[(1)] When installed in the field, GAS 3200 WM BIOGAS shall be located under a canopy to protect it against rain, snow deposit and direct sunlight radiations. Outdoor installation with Tamb < +5°C requires the heating unit with blower controlled by a PT100 probe to maintain the internal temperature of the cabinet at +8°C for outdoor temperatures down to -25°C.

TECHNICAL SPECIFICATIONS

Electrical specifications

- 220 VAC-50Hz power supply with main circuit breaker
- External 24 VDC power supply (for increased safety option, provided by the client)
- Cable glands for 220 VAC, 24VDC, RS232, 4-20mA and relays outputs

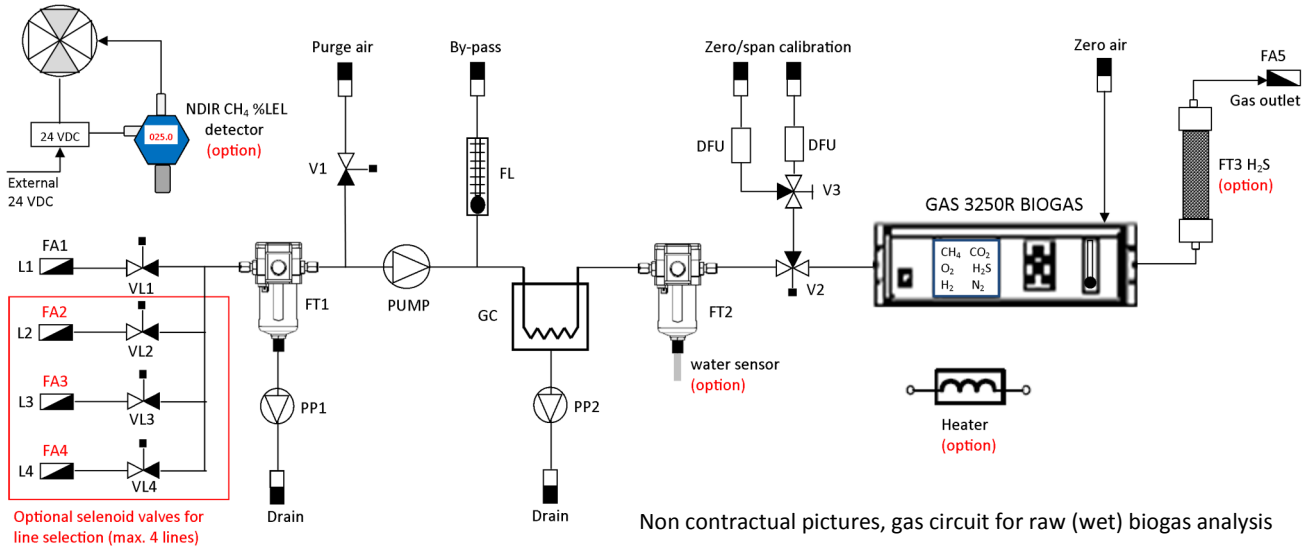


Gas sampling and conditioning

Our gas sampling and conditioning circuit is customisable to suit specific biogas quality, ambient operating conditions and single or multiple sampling points. It implements :

- Pressure reducer adjusted at 50 mbar @1L/min for biogas in pressure or powerful sampling pump (-600mbar @1L/min) for biogas at Patm or in under pressure
- FT1 + FT2 for biogas measure on clean and dry gas (after desulfurization unit) or additional Peltier gas cooler for raw biogas analysis

The analyser is fully assembled and tested in factory before delivery.



Non contractual pictures, gas circuit for raw (wet) biogas analysis

FA1-FA5

VL1-VL4
V1-V2

FT1

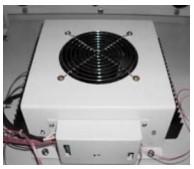
PUMP

GC1

FT2

V3

FT3



Heater

PP1

PR

PP2

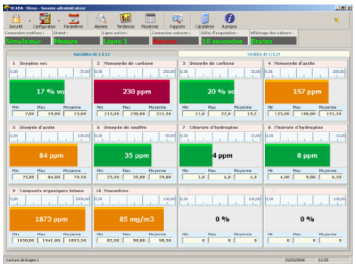
Water sensor

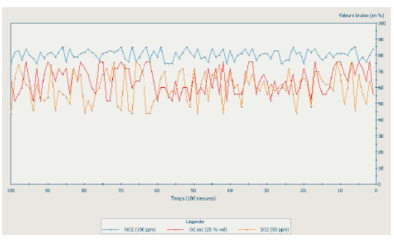
Legend

FA1-FA5	Flame arrestors on biogas inlet/outlet
VL1-VL4	2/2 biogas inlet solenoid valve
FT1	2 µm coalescing gas filter
PP1	Peristaltic pump for condensate removal
V1	2/2 air inlet solenoid valve (only with pump)
GC	1-path Peltier cooler for gas drying
PP2	Peristaltic pump for condensate removal
PUMP or PR	Gas sampling pump or Pressure regulator
FL	By-pass flowmeter (only with pump)
FT2	0.1µm safety gas filter
V2	3/2 solenoid valve for measure/calibration
V3	3/2 manual selection valve for zero/span
DFU	Inline filter
GAS 3250R	5-gas Biogas analyzer for online measure of CH_4, CO_2, O_2, H_2S and H_2
FT3	H_2S filter on gas exhaust
NDIR	Exd IIC T6 detector for increased protection

Options

- **Sequential analysis** on max. 4 sampling points
- **Water sensor** on FT2, with alarm module
- **H_2S Scrubber filter** FT3 on gas outlet
- **Internal heater** for outdoor installation
- **Increased safety protection with** internal Ex-proof NDIR %LEL CH_4 gas detector and forced ventilation (± 160 air renewal/hour).
- **Ethernet/TCP-IP or Ethernet Profinet COM** to PLC/DCS/PC
- **SCADA supervision software** for real-time acquisition and display of gas measures (as bar graphs or trend lines) & system status, and permanent archiving in a SQLserver2000 database (only with COM options)





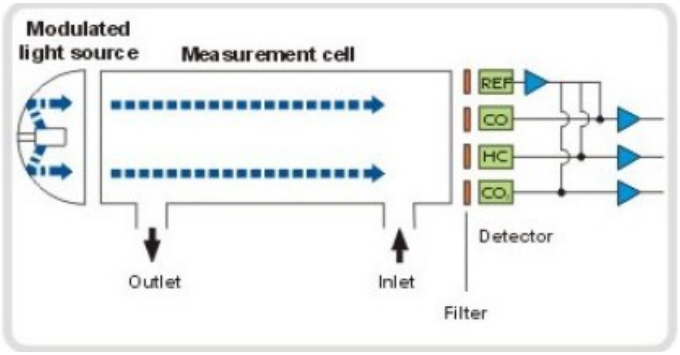
BIOGAS ANALYSER SPECIFICATIONS

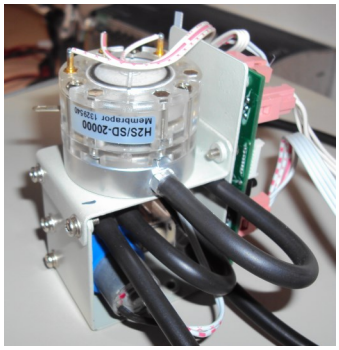
Measures	CH_4% - CO_2% - O_2% - H_2S ppm - H_2 ppm	
Calculation (option)	N_2%	
Gas analysis principle	CH_4 - CO_2	Infrared dual beam detectors (NDIR)
	O_2 - H_2S - H_2	Industrial electrochemical cells (ECD)
Standard measuring ranges	CH_4	0-100%vol
(other ranges on request)	CO_2	0-50% or 0-100%vol
	O_2	0-25%vol
	H_2S	From 0-10 ppm to 0-20000 ppm (2%vol)
	H_2	0-2000 ppm
Display	LCD (320 x 240), 4 digits	
Display resolution	CH_4 - CO_2 - O_2 : 0.01%	
	H_2S range ≤ 500 ppm: 0.1 ppm	
	H_2S range ≥ 1000ppm: 1 ppm	
	H_2S range 0-2%vol: 0.001%	
	H_2: 1 ppm	
Precision	CH_4 - CO_2 - O_2 : ≤ ±2% FS / H_2S - H_2 : ≤ ±3% FS	
Repeatability	≤ 1% FS	
Zero & Span Drift	± 1% FS/week	
Warm up time	800 seconds (30 minutes to full specifications)	
Auto zero function	Auto-zero function on ambient air during the last 100 seconds of the warm-up time	
	Programmable auto-zero function on ambient air via setting menu	
	Note : 4-20mA outputs are frozen during the zeroing cycle + 120 sec.	
H_2S measure/zero module	H_2S module with programmable measuring/air refreshing cycle for H_2S sensor ≥ 1000 ppm;	
	The module includes the H_2S sensor, solenoid valve, air pump and control board.	
Response time (T_{90})	CH_4 - CO_2 - O_2: ≤ 10 s / H_2S - H_2: ≤ 30 s	
Calibration	5 points factory calibration saved on the main board of the gas analyzer	
	2 points (zero and span) user calibration (span gas to be min. 90% of the full range)	
Sample Gas Conditions	Flow rate	Nominal 1L/min (0.7 to 1.2 L/min)
	Inlet pressure	20 mbar mini - 500 mbar maxi
	Outlet pressure	Atmospheric pressure
	Temperature	Gas dew point +4°C
	Quality	Free of dust, water and oil traces
Operation conditions	T_{AMB}	+5 to 50°C
	P_{AMB}	86 to 108kPa (860 to 1080 mbar)
	R_H	≤ 95% non-condensing
Communication interface	RS232 with proprietary communication protocol	
Analogue output signals	4-20 mA output per measuring channel	
Digital output signals	2 alarm relays (1A-24VDC) per measuring channel (freely adjustable level on the full range)	
Power supply	220 ±44 VAC - 50Hz ± 1 Hz	

Configurations

GAS 3250R	$CH_4 + CO_2 + O_2 + H_2S + H_2$
GAS 3240R EFF	$H_2S_{HIGH} + CH_4 + CO_2 + O_2 + H_2S_{LOW}$ (2 paths)
GAS 3240R	**$CH_4 + CO_2 + O_2 + H_2S$ (standard config.)**
GAS 3232R	$CH_4 + CO_2 + H_2S$
GAS 3231R	$CH_4 + CO_2 + O_2$
GAS 3230R	$CH_4 + O_2 + H_2S$
GAS 3222R	$CH_4 + CO_2$
GAS 3221R	$CH_4 + H_2S$
GAS 3220R	$CH_4 + O_2$
GAS 3210R	CH_4 or CO_2 or H_2S or O_2 or H_2

NDIR dual beam NDIR technology

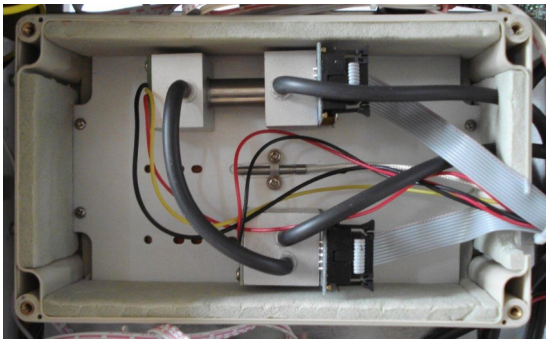




H_2S and H_2 range ≤500 ppm:
Continuous measuring mode

H_2S and H_2 range >500 ppm:
Discontinuous measuring mode with user programmable measure /refreshing cycle, to extend the ECD sensor lifetime.
Special module including air pump, solenoid valve and electronics.

Measure /refreshing cycle setting
Measuring time adjustable from 1 to 7 minutes
Refreshing time adjustable from 4 to 60 minutes
Default factory setting : 2min/32 min



Heated enclosure for NDIR detectors with auto regulation at 50°C controlled by PT100 probe