

**Overview**

The Set BGA (**biogas analyzer**) is a standardized system for stationary, continuous operation for the analysis of landfill gas, sewage gas or biogas.

**Benefits****Standardized complete system**

The standardized complete system has a modular configuration and can thus be used at various measuring locations for different measuring tasks.

- Simple and fast to configure
- Field-tested and matched Set in rugged industrial design
- Extremely high long-term stability
- The Set BGA is based on the proven ULTRAMAT 23

**Field-proven, reliable technologies**

- Autocalibration function with ambient air reduces the maintenance requirements
- Detonation protection in accordance with EN 12874
- Modular system design based on long-term tested components
- LEL sensor for cabinet monitoring (optional)

**Simple operation**

- Intuitive menu guidance
- Configuration on large displays with plain text
- Two freely-configurable limits per measured component

**Application**

The efficiency of biogenic production processes and optimum operation of the plant largely depends on continuous monitoring of the biogas composition. The basic version of the Set BGA analyzes CH<sub>4</sub> and CO<sub>2</sub> using the proven ULTRAMAT 23 IR analyzer. The concentrations of O<sub>2</sub> and H<sub>2</sub>S are optionally measured using electrochemical sensors and also converted into output signals of 4 to 20 mA. In this manner, the Set BGA contributes to operational safety and explosion protection in addition to process optimization.

The modular design of the system takes into account the physical conditions of the gas with regard to temperature and moisture in that various gas preparation components for heating or drying the sample gas can be configured as required.

The gas mixture can be explosive at critical concentration ratios between methane and oxygen. Even if such critical gas compositions occur extremely rarely, the danger of ignition must nevertheless be avoided. For this reason, the Set BGA is designed with a high safety standard and even the basic version is equipped with flow monitoring and detonation protection in accordance with EN 12874 in the sample gas path. To increase safety even further, a gas sensor for monitoring the ambient air can be connected as an option.

It is also possible to monitor up to six measuring points using an optional sample switching cabinet. In this case the sample flows are sucked in continuously using a powerful pump in order to achieve fast measuring times.

## Analytical Application Sets

### Biogas analysis

#### Set BGA

#### Design

The Set BGA consists of the following components:

- ULTRAMAT 23 analyzer with four measured components max.
- Analyzer cabinet with modularly configurable gas preparation components
- Cabinet for measuring point switchover (option)
- Heated line (option)

The ULTRAMAT 23 is selectable with two IR components (CO<sub>2</sub> and CH<sub>4</sub>). Furthermore, the configuration can be equipped with an electrochemical oxygen sensor and/or an electrochemical hydrogen sulfide sensor. The corresponding measuring ranges are listed in the table below.

Measured component	Smallest measuring range	Largest measuring range
CO <sub>2</sub>	0 ... 20 %	0 ... 100 %
CH <sub>4</sub>	0 ... 20 %	0 ... 100 %
O <sub>2</sub>	0 ... 5 %	0 ... 25 %
H <sub>2</sub> S (low)	0 ... 5 ppm	0 ... 50 ppm

The ULTRAMAT 23 calibrates the IR components and the electromechanical oxygen sensor automatically with ambient air. Calibration with calibration gas is recommended once a year or after oxygen sensor replacement. In order to comply with the technical specification data, the hydrogen sulfide sensor must be calibrated every three months. An appropriate calibration gas is therefore required. It is supplied to the analyzer through a manually switchable ball valve.



Set BGA measuring system



2-stream sample preparation

#### Technical specifications

<b>Installation</b>	
Ambient temperature	5 ... 38 °C, with cabinet heating ± 0 °C
Site	Indoor/outdoor installation (configurable)
<b>Gas inlet conditions</b>	
Sample gas pressure	<ul style="list-style-type: none"> <li>• With pump, depressurized suction mode, selectable with internal or external pump</li> <li>• Provision must be made for a pressure reduction for pressures greater than 1 200 mbar absolute</li> </ul>
Pump performance	Adjustable to 60 ... 80 NI/h
Sample gas temperature	Max. 45 °C, with moisture saturation
<b>Power supply</b>	
Supply 1	200 ... 240 V AC, 47 ... 63 Hz
Supply 2	100 ... 120 V AC, 47 ... 63 Hz
Power consumption	Approx. 180 VA (without cooler and sample preparation)
<b>Connection systems</b>	
Teflon hose	With PVDF screwed glands
Connection systems	Metric (6 mm) or imperial (1/4") selectable
<b>Dimensions</b>	
Set BGA measuring system (W x H x D)	600 x 781 x 600 mm
Sample preparation (W x H x D)	600 x 600 x 220 mm
<b>Weight</b>	
Set BGA measuring system	Approx. 50 kg
Sample preparation	Approx. 22 kg
<b>System design</b>	
System housing	3-part sheet-steel housing with window
Degree of protection	IP54
Cabinet conditioning	Fan
Cooling system	Peltier cyclone cooler (optional)
Sample preparation	Max. six sample streams can be controlled using Logo module with fast loop pump in separate housing
Analog outputs	Per component 0/2/4 ... 20 mA; NAMUR, floating, max. load 750 Ω
<b>Measured components / measuring ranges</b>	
CH <sub>4</sub>	0 ... 100 vol.% to 0 ... 20 vol.% (NDIR)
CO <sub>2</sub>	0 ... 100 vol.% to 0 ... 20 vol.% (NDIR)
O <sub>2</sub>	0 ... 25 vol.% to 0 ... 5 vol.% (electrochemical or paramagnetic optionally selectable)
H <sub>2</sub> S	0 ... 5 ppm to 0 ... 50 ppm (electrochemical); optional
<b>Safety assemblies</b>	
Assembly 1	Detonation protection F501
Assembly 2	Flow measurement with limit monitoring at the output
Assembly 3	LEL monitoring (optional)
<b>Comment</b>	
<ul style="list-style-type: none"> <li>• The system concept of the Set BGA is based on the preconfigured ULTRAMAT 23 solutions (7MB2335-..., 7MB2337-...)</li> <li>• The technical performance data concerning the measuring response correspond to the catalog data of the ULTRAMAT 23. The preconfigured version does not contain any ULTRAMAT 23 add-ons or retrofitting sets.</li> </ul>	



## Analytical Application Sets

### Biogas analysis

#### Set BGA

Set BGA basic configuration, including flame arrestor	7MB1955-	Cannot be combined
<b>H<sub>2</sub>S measurement</b> Without H <sub>2</sub> S sensor With H <sub>2</sub> S sensor, 0 ... 5 ppm to 0 ... 50 ppm	A D	D
<b>Documentation</b> German, 1 set (paper and CD) English, 1 set (paper and CD) French, 1 set (paper and CD)	0 1 2	
<b>Further versions (add-ons)</b>		
Add "-Z" to Article No. and specify Order code		
Heated sample gas line, self-regulating, Ex-proof		
<ul style="list-style-type: none"> <li>Length: 5 m, supplied separately</li> <li>Length: 10 m, supplied separately</li> <li>Length: 15 m, supplied separately</li> <li>Length: 20 m, supplied separately</li> <li>Length: 25 m, supplied separately</li> <li>Length: 30 m, supplied separately</li> <li>Length: 35 m, supplied separately</li> </ul>	A01 A02 A03 A04 A05 A06 A07	
Communication		
<ul style="list-style-type: none"> <li>PROFIBUS PA interface</li> <li>PROFIBUS DP interface</li> </ul>	A12 A13	
Fast loop design and sample switching		
<ul style="list-style-type: none"> <li>2-stream sample switching with Logo and external pump</li> <li>3-stream sample switching with Logo and external pump</li> <li>4-stream sample switching with Logo and external pump</li> <li>5-stream sample switching with Logo and external pump</li> <li>6-stream sample switching with Logo and external pump</li> </ul>	B02 B03 B04 B05 B06	
Gas sensor for leak monitoring of the Set BGA system		
<ul style="list-style-type: none"> <li>Alarm monitoring: 20 % LEL methane</li> </ul>	C01	