

optimize your plant



## **Multitec® BioControl** | Combined stationary measuring device with mobile gas meter



# Multitec® 540 and Multitec® 545: independent measuring anywhere

The mobile **Multitec® 540** and **Multitec® 545** gas measuring devices can simultaneously measure the concentrations of up to five gases. This makes them ideal for the precise analysis and monitoring of gas mixtures that are produced during biological processes. Equipped with infrared sensors, they can reliably determine the methane and carbon dioxide concentrations without distortion from other gases. The large display shows the values simultaneously and clearly so that you can see everything at a glance. The mobile measuring devices can be fitted with optional electrochemical sensors to calculate oxygen, hydrogen sulphide and carbon monoxide concentrations. The measurement data saved in logs can be conveniently transferred to PC via the USB port. Sewerin provides the necessary software free of charge.

## Advantages

- **Certified explosion protection:** TÜV 07 ATEX 553353 X (Ex) TG8 carrying bag; allows analysis of (raw) biogas produced in all areas of the plant
- **Easy-to-service design, minimal downtime, highly cost-effective:** quick and easy maintenance thanks to durable built-in sensors, mobile devices easy to send by post (maintenance by SEWERIN Maintenance Service available even through local utility companies)
- **Extremely user-friendly** thanks to jog dial, intuitive menu navigation and large function keys
- **Selective infrared sensors** for distortion-free measurement of hydrocarbon and carbon dioxide concentrations
- **Durable electrochemical sensors** for measuring the concentrations of oxygen and toxic gases; **Multitec® 545** extended H<sub>2</sub>S measuring range 5,000 ppm, **Multitec® 540** up to 2,000 ppm, device selected according to individual application
- **Economical and user-friendly power supply:** four replaceable AA-size rechargeable or disposable batteries
- **Long operating times:** minimum seven hours, rapid charging in four hours
- **Practical, steady bow-shaped handle for carrying and setting up:** easy to carry, lightweight measuring device (approx. 1,000 g)
- **Clear, semi-transparent 4.3" matrix display:** with practical backlight, excellent readability even in direct sunlight
- **Convenient data transfer** to computer via USB port



## Measuring ranges and sensors

| Gas type          | Measuring range <b>Multitec® 540</b> | Measuring range <b>Multitec® 545</b> | Sensor type             |
|-------------------|--------------------------------------|--------------------------------------|-------------------------|
| Methane           | 0.0 – 100% vol.                      | 0.0 – 100% vol.                      | Infrared sensor         |
| Carbon dioxide    | 0 – 100% vol.                        | 0 – 100% vol.                        | Infrared sensor         |
| Oxygen            | 0.0 – 25% vol.                       | 0.0 – 25% vol.                       | Electro-chemical sensor |
| Hydrogen sulphide | 0 – 2000 ppm                         | 0 – 5000 ppm                         | Electro-chemical sensor |
| Carbon monoxide   | 0 – 500 ppm                          | 0 – 500 ppm                          | Electro-chemical sensor |



# BioControl 2: user-friendly, flexible, efficient

## The entry-level model for automated gas analysis supporting process optimisation

**Multitec® BioControl** is the ideal system for the continuous automatic measurement and monitoring of the composition of gas: simple, safe and efficient. Be it in a **biogas plant, landfill, wastewater treatment plant** or even a **composting plant** – the unique device combination of a stationary unit and mobile gas measuring device offers a cost-effective and easy switch to process optimisation and control.

The **BioControl 2** fulfils the main measuring requirements of all **small to medium-sized plants**: it saves time and money, it is user-friendly and flexibly customisable. For plant manufacturers the **BioControl 2** is an option that offers high quality technology at a very reasonable price.

The **Multitec® BioControl** system consists of the permanently installed, fixed **BioControl 2** device and a mobile gas measuring device. Depending on your unique requirements, you can choose between the **Multitec® 540** or the **Multitec® 545** mobile measuring device.



## Operating principle

The **BioControl 2**, with its two gas sample inputs, offers all you need to automatically and thus effortlessly measure the exact gas composition in a plant from a stationary position. The system allows reliable data storage and continuous monitoring. For example, the first stationary measurement location can continuously monitor the gas composition at the motor while the second stationary measurement location is used e.g. for calibration purposes with test gas. The mobile measuring device, on the other hand, can be easily used for infinite manual measurements at remote parts of the plant at irregular intervals.

Data can be transferred via LAN, or optionally by Modbus, Profibus or Profinet. The alarm relay can be freely configured via the touchscreen.



## Advantages

- **Module-based concept** (one mobile and one stationary measuring device, easy maintenance due to measuring technology installed in mobile device)
- **Data communication** with superordinate control and remote operation based on several interfaces
- **Individual configuration** according to specific requirements
- **Reliable measurement results** due to permanent self tests under normal operation and automatic calibration with test gas
- **User friendly** operating concept with menu navigation
- **Autonomous and regular storage** of all measurement data and settings on USB flash drive
- **Remote maintenance** and diagnostic via internet possible
- **7" high-resolution** colour touchscreen
- **Settings protected** by password



# Multitec® BioControl 4 and 8

## The premium system for gas analysis and volume measuring supporting professional process optimisation

All plant operators producing electricity from biogas, sewage gas or landfill gas aim to optimize processes and thus ensure greater efficiency – in other words, obtain as much methane as possible. At the same time, however, harmful components in the gas need to be kept to a minimum.

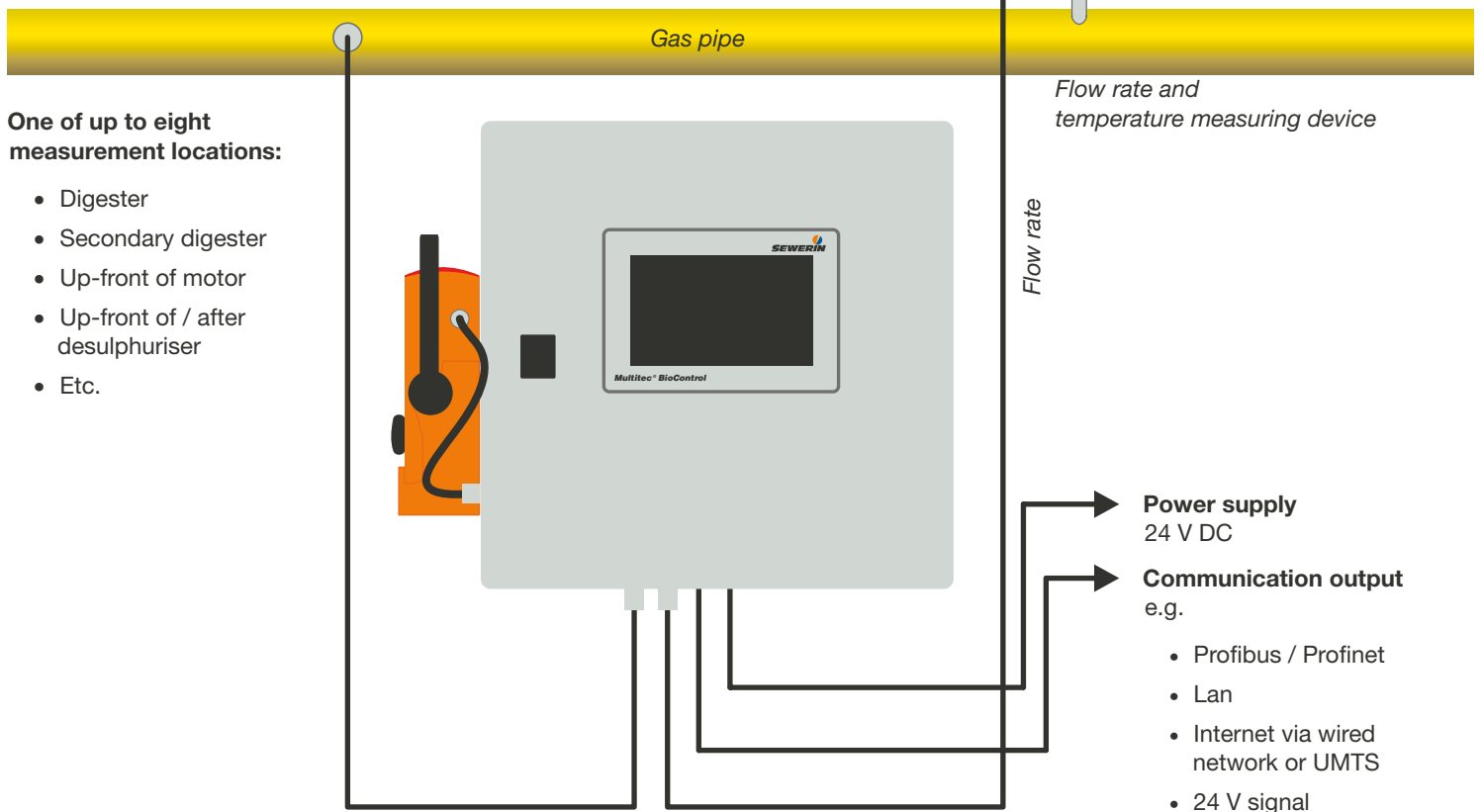
Only constant monitoring of the gas composition in a plant can indicate changes in time and thereby prevent prolonged outages. The continuous monitoring of hydrogen sulphide ( $H_2S$ ) prevents expensive corrosion damages of the motor by giving an alarm in case of high concentration of  $H_2S$  in the gas. Also the oxygen concentration can be monitored to avoid explosive gas composition in the motor.

If the power generation is subsidised, the plant operator must regularly document the gas composition and volume. The **Multitec® BioControl** can reliably and sustainably handle all these tasks, though dirt, deposits, moisture, corrosion and fluctuating gas compositions still pose a major challenge.

The **Multitec® BioControl** can also determine the gas flow rate and the gas temperature. Effects of pressure, temperature, moisture and gas composition are compensated intelligently, which results in a high accuracy of the flow volume measurement.



## System drawing





# Multitec® BioControl 4 and 8

## One system for stationary and mobile measurements

The **Multitec® BioControl** is a modular measuring device consisting of the **Multitec® BioControl** fixed installation and the mobile gas measuring device **Multitec® 540 / 545**.

Depending on the version of the **Multitec® BioControl**, the gas composition and volume can be automatically measured and monitored at up to eight measurement locations.

The **Multitec® 540** monitors the values at the individual measurement locations sequentially. The values are transferred to the **Multitec® BioControl** via an interface.

The **Multitec® BioControl** allows easy automatic calibration and adjustment with test gas.

The **Multitec® BioControl** fixed installation is non-wearing and low maintenance. The maintenance is limited to regular check for dust / dirt of the filters and (i.a.) the flow meter and calibration of the mobile device. The mobile **Multitec® 540** gas measuring device must be regularly maintained to guarantee accurate measuring results. It can be easily sent in for servicing. A spare device prevents disruption to operation.

## Flow volume measurement

ATEX-certified mass flow meters and temperature transmitters, which can be permanently installed outdoors (connected to the **Multitec® BioControl** by transmitter cable), are available as optional accessories for **Multitec® BioControl 4 / 8**. The flow measuring is based on the specific heat capacity of the gas and is realised by a robust device, which comes along without any moving parts. To ensure high measuring accuracy the thermal mass flow meters are calibrated to a "typical" gas mixture of 60% Methane and 40% carbon dioxide. The calibration certificate is included in the scope of delivery. To cope with the typical fluctuating gas compositions of a biogas process and the content of humidity in the gas, correction functions take into account the true gas composition and/or the humidity on demand. Altogether the combination of the **Multitec® BioControl 4 / 8** with the thermal mass flow meters provides a very accurate, robust and wear-free measurement of flow volume.



## Measurement ranges / resolutions

|                            | Measuring range                            | Resolution / comment                            |
|----------------------------|--|---|
| Flow rate                  | 0 – 30 Nm/s                                | Flow velocity measuring range                   |
| Nominal installation width | 60 – 260 mm                                | Adjustable diameter                             |
| Temperature                | 0 – 55 °C, equivalent to 0,5 – 18.7 % vol. | Measuring range corrected according to humidity |

# Multitec® BioControl 4 and 8

## Mobile measurements

Individual measuring locations can also be set up for mobile, i.e. manual measurement if preferred. The **Multitec® 540** is simply taken out of the **Multitec® BioControl** docking station for the measurement.

When being replaced in the docking station following a mobile measurement, the stored logs of the mobile measurement can be transferred to the **Multitec® BioControl** and stored and displayed as an extra measurement location.

Mobile measurements allow you to integrate even remote outdoor measuring points reliably and cost-effectively in the system.

## Advantages

- **Large, state-of-the-art 7" colour touchscreen:** simple user-defined settings, language selection
- **Flexible configuration to individual requirements:** measurement locations/cycles, saving intervals, limits, alarm thresholds
- **User settings can be reproduced from the day of commissioning** (saved on USB stick)
- **Reliable measuring results** by way of self testing during operation
- **Sturdy and durable:** all relevant components resistant to aggressive gases
- **Autonomous and regular saving of all measurement values and settings** to USB stick; no data loss, no manual logging, complete documentation
- **Comprehensive servicing:** stationary unit virtually maintenance-free, rapid first-class support thanks to customer-friendly remote maintenance and diagnostics – anywhere in the world by internet, simple automatic calibration/adjustment by test gas

The **BioControl 4 / BioControl 8** and **Multitec® 540 / 545** combination is a unique system. Not only does it provide precise information about the gas composition, it also accurately measures and evaluates the volume of gas produced. The efficiency of a biogas plant, landfill, sewage treatment or composting plant can be exactly calculated at any time. For example, when seasonal changes occur in the substrate, you can immediately see how these affect not only the gas quality, but also the volume of gas produced.

The high-quality device combination enables diverse, complex measurements with up to four to eight measurement locations and four 4 - 20 mA output signals. The flexible **Multitec® 540 / Multitec® 545** device is a huge asset. Not only can it be removed from the base unit for servicing, it also allows independent, mobile measurements – simply unique!

## Product

- **Multitec® BioControl 4**
- **Multitec® BioControl 8**

The number at the end of the product name indicates the maximum number of measurement locations that can be connected by hose as part of the installation.





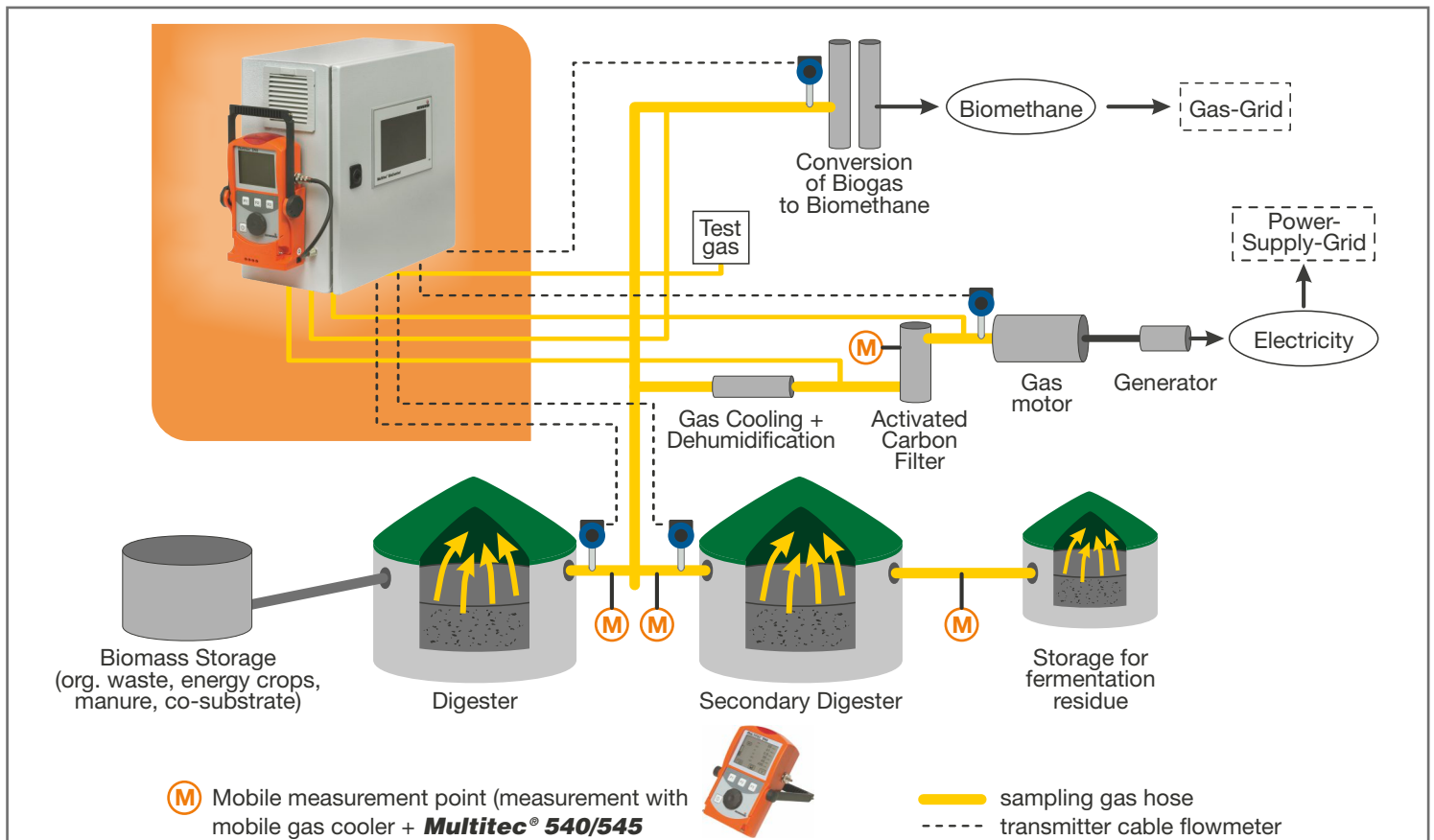
# Multitec® BioControl points of measurement

The **Multitec® BioControl** brings benefit to numerous applications, which require the analysis of gas quality and perhaps the gas volume measurement. In the biogas process, monitoring the gas quality and gas volume is of particular importance at several points in the process flow:

- Before handing-over the produced biogas to subsequent process steps as power generation or the conversion to biomethane, in order to
- Meter the quantity of produced methane to monitor process efficiency
- Control the oxygen concentration (explosion protection)
- Prevent corrosion of the motor due to high concentration of hydrogen sulphide ( $H_2S$ )
- Control the loading status of the activated carbon filter by the concentration of hydrogen sulphide ( $H_2S$ )
- At the gas outlet of the particular digestion steps in order to monitor the process biology by means of the content of methane, carbon dioxide, oxygen and/or hydrogen sulphide

## Gas preparation

In order to ensure reliable measurement results and a long life of the sensors, humidity inside of the measuring devices must be avoided in either case! For dry or dehumidified gas, as e.g. gas at the hand-over point to the power generation (after gas cooling / dehumidification) an installation with permanently connected hoses is excellent. In case of doubt, a gas cooler helps to cool and dehumidify the gas in order to prevent condensation in the hose or in the measuring device. Humid gases as e.g. moisture saturated digester gas, can be analysed safe and trouble-free as mobile measurement location with the aid of a mobile gas cooler.



# Multitec® BioControl

## Optional accessories



### Flow rate and temperature transmitter 300

- Thermal mass flow meter, robust and explosion protected device
- For wear-free measurement of gas volume and gas temperature in combination with **BioControl**
- Correction of flow volume according to gas temperature, gas composition and gas humidity by **BioControl** on demand

### PROFIBUS module

- Preconfigured serial interface module for connecting to controls as PROFIBUS DP-V0 slave
- Including GSD file

### PROFINET module

- Preconfigured interface module for connecting to controls as a PROFINET slave
- Including GSDML file
- LED status indications

### Test set SPE BioControl

- For calibration and adjustment of measuring accuracy of **Multitec® 540 / 545** within the **BioControl** with test gas
- Ensures consistent measuring accuracy
- Connection for SEWERIN test gas can
- For using test gas can Bio IR, 60% vol. CH<sub>4</sub> (methane), 40% vol. CO<sub>2</sub> (carbon dioxide) and 180 ppm H<sub>2</sub>S (hydrogen sulphide)
- Including one test gas can BioIR

### Portable measuring gas cooler

- For **Multitec® 540, 545, 560**
- Strongly recommended for the mobile measurement of moist or warm measuring gas (e.g. raw biogas)
- For regulating the measuring gas to ambient temperature and draining off condensate from the gas sampling tube for greater accuracy of measurement values
- Prevents condensation in the measuring device and consequent measuring errors as well as premature wear of the sensor
- Fitted and ready to operate on tilted base plate with carrying handle, adjustable feet and water separator



Please contact us for a comprehensive quotation, including additional technical specifications and information on accessories.