COMBIMASS®

Technical Data

COMBIMASS® GA-s hybrid premium

BINDERGROUP
MEASUREMENT & CONTROL

BETTER CONTROL. BETTER ENVIRONMENT.

For decades now, Binder has been supplying leading plant manufacturers with innovative systems for industrial gas flow measurement. In the last few years, the demand for reliable, precise and cost-effective measuring systems for biogas, sewage gas and landfill gas has increased significantly. Since the composition of these gases changes over time, the combination of flow measurement and gas analysis brings great advantages:

- Always providing the most precise quantity measurement, even in changing conditions
- Cost advantages by avoiding the doubling up of components
- Attractive additional functions by linking the data up of components

Modern agricultural anaerobic digestion plants cannot meet commercial and environmental requirements without appropriate measuring and analyzer technique. Analyzer technology is used to determine the gas composition in the individual fermenter stages, for filter monitoring in gas treatment and upstream of the CHP unit. In biomethane plants, analysis technology is used to monitor and control each individual process stage.

In solid waste fermentation or waste treatment plants (box fermentation), the measuring cycle must be adapted by the start-up and shut-down phases. Here, not only the gas quantity but also the gas composition changes substantially more strongly. The methane concentration may vary from 15 to 75 % Vol.%. A combination of the quantity measurement with the gas analysis is inevitable, if the values are to exhibit an acceptable accuracy.

In sewage treatment plants, the analysis is used to monitor the biogas quality and to monitor the H_2S filter upstream of the CHP, to reduce the wear of the CHP units and to meet the requirements of the CHP unit manufacturers with regard to monitoring the gas quality. The biogas quality itself is subject to much smaller fluctuations compared to biogas plants.

At landfills, analysis technology is used (mostly mobile) for long-term monitoring of individual fields or (stationary) for monitoring landfill gas quality in the header pipeline. Since the quality of the gases deteriorates with increasing age of the landfill, in older landfills the landfill gas (poor gas) often has to be mixed with gas with a higher methane content (good gas), e.g., from a green waste fermentation plant or composting plant, in order to meet the minimum requirements with regard to methane content upstream of the CHP. Also, in this application the gas analyzer can monitor the quality of the gas mixtures. At landfills, it is advisable to measure the gas quality automatically only at the CHP plant and to measure distant measuring points of individual fields on a mobile basis

Exhaust air may contain traces of methane and hydrogen sulfide. Measuring ranges and measuring cycles are adapted according to the measuring task.

The GA-s hybrid premium analyzer station is completely modular. All pumps and valves are individually mounted on top-hat rails for easy replacement. The gas cells are installed in modules which are also mounted on a top-hat rail in the analyzer cabinet. On the one hand this offers the possibility to measure single gas components in higher concentrations or continuously, on the other hand it also improves the flexibility regarding measuring cycles of single gas streams. The data can be stored internally or transmitted via various standard interfaces.

The analyzer station is available in different versions: for indoor or outdoor installation in a safe room (non-EX) or also in an EX-version for zone 2. The outdoor version is available for different temperature ranges: moderate up to max. +30°C, for warmer climatic installation locations up to +45°C, special versions up to +55°C. The hardware and its temperature resistance are adapted to their respective ranges. Emergency shutdowns in case of overtemperature are integrated.

All stations have software-integrated maintenance diagnostics that indicate the need for recalibration via a pre-alarm and the need for service via a main alarm. Some models additionally use traffic light colors for visualization. If an analyzer station from another supplier is sent in for maintenance, the operator has to do without current values during this time or, alternatively, bear comparably high costs for on-site service. All spare and wear parts in the station can be easily replaced via Click-OUT! / Click-IN! on the top-hat rail by the operator himself or a service company without limiting the warranty. This takes less than 15 minutes. Only the gas modules should be serviced by the manufacturer or a local service center.

APPLICATION VERSTALITY

- Biogas from biogas fermentation plants
- Biogas from sewage treatment plants
- Landfill gas
- Biogas from solid waste treatment plants (Composting)
- Biogas in gas processing & upgrade to biomethane
- Exhaust air from covered tanks or rooms (e.g., from wastewater pretreatment)

TECHNICAL DATA ANALYZER STATION

DETAILS CABINET

- Analyzer cabinet for wall mounting / stand mounting
  Indoor: min. 400x600x200 (plastic enclosure)/ 600x600x210 (stainless-steel), IP22, 24 VDC
  Outdoor/EX-Version: 800x1.000x300 (plastic or stainless-steel), IP 54, 230 VAC
  for wall mounting, option with a stand and weather protection hood (outdoor)
  Installation temperature: Indoor +5 to +40°C respectively outdoor/ EX -25 to +45°C/55°C
  Gas temperature: +5 to +40°C, option to +70°C (operation with a gas cooler)
- SPS and 4,3“or 7“(option) colored-touch-Graphic display in the door or mounted inside the cabinet, with connections for plastic hoses or stainless-steel pipes
- 2-10 Solenoid valve NC-/ 3-Way valve on a top-hat rail, 1-3 sample gas pumps (OPTION: low-wear brushless pump) on top-hat rail
- Gas module(s) depending on the version, pressure- and temperature compensated (other gases on request)
  COMBIMASS® CH_4 -NDIR-hybrid 0-100 Vol.-%
  COMBIMASS® O_2 -EC-hybrid 0- 30 Vol.-%
  COMBIMASS® H_2S -EC-hybrid 0- 50 … 10.000 ppm (various measuring ranges) …
  options: high-precision calibration (HA), Hight temperature version (HT, with integrated cooling system)
- Integrated maintenance diagnostics function for gas modules using traffic light colors
- 1-3 Test gas inlets for calibrating the gas cells in the Analyzer station (manual and menu-driven, optional: Auto calibration function)
- Transmission of data & alarms: 4-20 mA, digital- or relay outputs, standard bus system
- Automatic correction of read-in gas flow signals to current gas composition, determination of dry biogas quantity in standard condition according to DIN1343 for partially saturated gases with a humidity sensor
- Option: gas feedback to process pipe

TECHNICAL DATA

Dimensions	Indoor KS (plastic) 400 x 600 x 200 (Standard plastic cabinet for 1-4 gas modules and up to 2 gas sampling points, otherwise correspondingly larger) SS (stainless steel) 600 x 600 x 210 (SS for 1-4 gas modules and up to 2 gas sampling points, otherwise accordingly larger) Outdoor resp. EX-Version KS (plastic) / SS (stainless steel) 800 x 1.000 x 300 (EX-version: SS design only)
Installation place	Indoor: room monitored by separate means, +5 to + 40°C, humidity < 80% rel., non-corrosive Outdoor/ EX: -25 to + 45°C Option: Design maritime climate/desert climate (+55°C)
Gas properties	+5 to +40°C, < 90% rel. humidity optionally with gas cooler
Protection class	IP22 (indoor) IP54 (outdoor, EX)
No. Gas sampling points Test gas	 Standard: 1 (expandable) Standard: 1 (expandable)
Weight	standard analyzer cabinet from 12 kg (depending on equipment valves, pumps and gas modules)
Power consumption	50 W/h for the analyzer cabinet (standard indoor) Energy consumption outdoor / climatized cabinet depending on design
Gas pre-treatment	Fine particle filter, coalescence filter with condensate trap and manual drainage/with automatic drainage, pressure regulator, flame arrester, gas cooler
Connections GAS-IN / GAS-OUT / CONDENS-OUT	Standard: plastic, recommendation: Norprene Ø 6.4 mm/ Ø 3.2 mm; option Tygone Ø 6.0 mm/ Ø 4.0 mm) Option: stainless-steel Ø 6.0 mm/ Ø 4.0 mm)