Speed Pressure Flow rate Temperature

Stationary Gas Analysis System Goliath

for bio methane, landfill gas, sewage gas , mine gas and biogas

Rev.-no.: Goliath-DS 320 E-V0.3 2013-11-08

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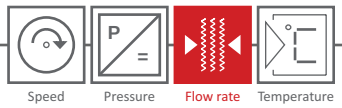

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Overview

The stationary gas analysis system consists of the following components:

- **Gas Analysis Goliath**
  robust gas analysis with ATEX certification (mobile use) and integrated pump for the special use in the sector bio methane, landfill gas, sewage gas, mine gas and biogas
- **MLK Station**
  for measuring, loading and communication (stationary measuring point)
- **Goliath Controller**
  for communication, control and supply of up to 4 MLK Stations (measuring points) and transmission of all measuring values via RS 232 to Esters devices or PLC systems

Gas Analysis Goliath and MLK Station incl. wall mounting

Goliath Controller

- Due to the modular design of the whole system, onsite-maintenance by technicians is not necessary anymore. The exchange of broken components is done by technically skilled personnel. Delivery of components takes place on “pick up and return” basis.
- The battery powered Gas Analysis Goliath provides ample protection against EMC interferences which might occur at feed-in stations. A sensor drift caused by EMC influences in fact is excluded.
- The use of infrared sensors for CH_4 and CO_2 guarantees a quick setup phase and extremely short reaction time and cross-sensitivity against other gases are ruled out when measuring.
- The Gas Analysis Goliath can also be used as a mobile device or to detect leakages – just by being removed from the MLK Station. In mobile mode, the device has the ATEX certification BVS 09 ATEX E 079 X iEx II 2G Ex ib d II B T3/T4.
- Multiple MLK Stations can be used with one Goliath gas analysis.
- Using multiple MLK Stations and Goliath gas analysis, the devices can be interchanged for controlling the measuring values.
- With the optional available long probe set, the Goliath can be used as a gas detection system.

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General Description

In the sector of biogas, landfill gas and sewage gas production, the monitoring and control of the gas composition and also the monitoring of the plant for unintended gas outlets is an integral part of the work flow.

The Gas Analysis System Goliath combines the advantages of stationary and mobile measuring systems.

Device Description

The gas analysis system Goliath biogas consists of the components Gas Analysis Goliath, MLK Station and Goliath Controller.

Gas Analysis Goliath

The Esters Goliath is a robust gas analysis with an integrated pump for the special use in the sector of bio methane, landfill gas, sewage gas, mine gas and biogas.

The device needs only a very short initial running and guarantees fast and definite results. The built-in infrared sensor measures the concentration of methane and carbon dioxide in less than 10 seconds.

For stationary use, measurement intervals from 5 minutes to 12 hours are preferable. The robust and shock resistant device is easy to operate. All measuring values can be seen on the clear and backlit display.

MLK Station

The MLK Station serves as stationary measuring point/ system bus participant for the gas analysis and provides the functions measuring, loading and communication.

The station and the Gas Analysis Goliath communicate via an infrared interface. When using multiple gas analysis and MLK Stations, the gas analysis can be interchanged to validate measuring results.

Each MLK Station is equipped with magnetic valves for test gas, sample gas and purge gas. The station is fixed on a wall mounting with a “quick out” functionality which allows a fast swapping of the components. The connection to the Goliath controller is realized via a system bus interface.

Gas Analysis Goliath with MLK Station

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Goliath Controller

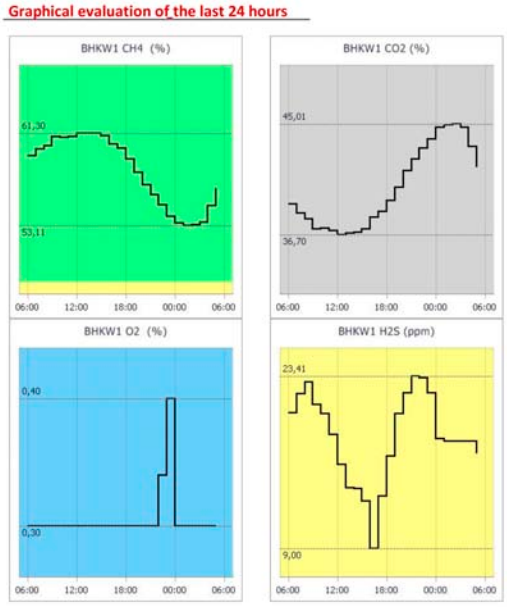
The Goliath Controller is used for communication, control and supply up to 4 MLK Stations. The device controls the measurement cycle of all connected analysis including peripherials via RS 485 data bus. On base of the RS 485, distances of up to 100 meters between measuring points can be bridged. With it, star cabling and series cabling is possible.

The transmission of the measuring data is realized via RS 232. The Goliath Controller can be connected directly to the devices GDR 1404, GDR 1407 and GDR 1408 from Esters or to other controllers.

From there, the measuring values can be transmitted via industry bus systems (PROFIBUS DP, Modbus RTU, Modbus TCP) and Ethernet TCP/IP to PLC systems.

Additionally, the Esters devices support the storage of measuring values into an external SQL database via USB or Ethernet TPC/IP. With the software Esters Energy Efficiency Management and Device Manager (E3DM), the stored data can be analyzed in tables and graphics. A daily status report can be created and sent via email with the Esters Infoserver (EIS), using the SQL database. The time of delivery of the reporting is freely choosable.

Gas Analysis System Goliath with connection to the Firing Thermal Capacity Calculator GDR 1408



Extract of the status report from the Esters Infoserver

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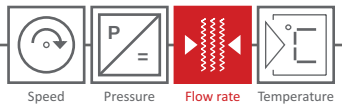

Technical Details

Measuring ranges

SENSORS		MEASURING RANGE	RESOLUTION	MEASURING PRINCIPLE	WARRANTY
HYDROCARBON (METHANE)	standard	0 - 100 Vol.-% CH_4	0,1 Vol.-% CH_4	infrared	24 months
CARBON DIOXID	standard	0 - 100 Vol.-% CO_2	0,1 Vol.-% CO_2	infrared	24 months
OXYGEN	optional	0 - 25 Vol.-% O_2	0,1 Vol.-% O_2	electrochemical	24 months
HYDROGEN SULPHIDE	optional	0 - 2.000 ppm H_2S	1 ppm H_2S	electrochemical	12 months

APPLICATION LEAKAGE DETECTION	MEASURING RANGE	RESOLUTION	ALARM
DETECTION OF GAS LEAKS	0 - 10.000 ppm CH_4	approx. 100 ppm CH_4	acoustically and visually
	0 - 10.000 ppm CO_2	approx. 100 ppm CO_2	acoustically and visually

Gas Analysis Goliath

	DESCRIPTION
DISPLAY	LC display with a resolution of 128 x 64 pixels, backlit
OUTPUT	RS 485 interface with transmission protocol for connection to the Goliath controller
POWER SUPPLY	NiMH cells
WORKING TEMPERATURE	-10 °C to +40 °C
OPERATING TIME (WITHOUT BACKLIGHT)	> 9 hours
CHARGING	MLK Station with 12 V supply or charging station with 230 V / 12 V charging time 5 hours
DATA STORAGE	flash memory with 4 MB for more than 1 million measurement values
HOUSING	protection class IP 54
DIMENSIONS	168 x 90 x 80 mm without coupling connections
WEIGHT	approx. 1200 g, depending on sensors equipped
EX VERSION	BVS 09 ATEX E 079 X – II 2G iEx ib d IIB T3/T4

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Goliath Controller

ELECTRICAL VALUES GOLIATH CONTROLLER	
SUPPLY VOLTAGE	12 V, DC, ± 1,0 %, maximum 14 V, DC
POWER CONSUMPTION	150 mA + 1 A per measuring point, maximum 5 A
POWER CONSUMPTION	60 W when using 4 measuring points

ENVIRONMENTAL CONDITIONS	
AMBIENT TEMPERATURE	-10 to +60 °C
STORAGE TEMPERATURE	-20 to +85 °C
TEST VOLTAGE	3 kV
HUMIDITY CLASS	E-DIN 40040
ELECTROMAGNETIC COMPATIBILITY	according to EN 50082-2

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Ordering Codes

ORDER NO.	DESCRIPTION
320-1000	Gas Analysis Goliath as gas analyzing system
320-1001	MLK Station to set up a measuring point, incl. wall mounting
320-1002	Goliath Controller to control the Gas Analysis Goliath and MLK Station
320-0001	integrated oxygen sensor for No. 320-1000, measuring range 0 to 25 Vol. % O_2
320-0002	integrated hydrogen sulphide sensor for No. 320-1000, measuring range 0 to 2000 ppm H_2S
320-0003	pressure regulator PED basis pressure and flow limiter for targeted gas supply
320-0004	areal probe V2 SIGI EX with flexible probe V2
320-0005	long probe set incl. carrier bag scope of delivery: 3 x extension 1 m probe handle 1 m triangle probe connection hose 1 m carrying system industrial probe set
320-0006	switching power supply 230 V, AC to 12 V, DC for Goliath Controller rail mounting, closed construction protected screw connections overload protection through current limiting LED display for power on

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Speed Pressure Flow rate Temperature

CHP Gas Monitor GDR 1404
for sewage gas, mine gas, landfill gas and biogas

- for direct measurement in Nm^3

for more information please see data sheet DS 307 E

CHP Efficiency Calculator GDR 1407
for sewage gas, mine gas, landfill gas and biogas

- for continuous monitoring of the energy generation

for more information please see data sheet DS 307 E

Firing Thermal Capacity Calculator GDR 1408
for sewage gas, mine gas, landfill gas and biogas

- for calculation of the primary energy in MWh

for more information please see data sheet DS 311 E

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