

# SONOS

## Gas Analysing System for bio reactors

The gases O<sub>2</sub>, CO<sub>2</sub> and the total hydrocarbons are process relevant with procedural procedures in the bio reactor.

The concentration of these gases is affected by the biochemical process.

Because of the gas concentration measured the process can be optimised by the operator by adding or deducing bio-active components.

The gas analysing system SONOS is a flexible system which can be applied any time to the special requirements and measurement tasks of the bio reactor. This is of particular importance in view of the problem of the gas samples with small bio reactors because of the low quantity of gas.

### ➤ Contemporaneous measurement

Measuring of all three components in one measuring cell by acoustic velocity measurement and other integrated measurements.

### ➤ Optimum sampling by variable adjustment of the gas flux

Due to the variable adjustment of the gas flux an optimum sampling of smaller gas quantities of minor bio reactors takes place which are at disposition for measuring.

### ➤ Reducing of dead volume

Due the pre-extraction by means of valve engineering control a reduction of the dead volume can be obtained and thus a measurement acceleration.

### ➤ Internally realized field bus

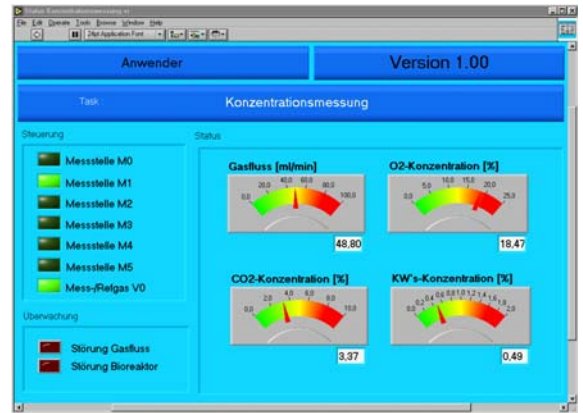
An internal field bus has been realized for the most important SONOS' gas analysing system. These are the modules of:

- analytic
- display-indication and keyboard input
- control of peripheral components, valves and analogous read outs

Due to this field bus technology an internal data processing system can access any of these modules. All data flows running via the field bus can be processed by this computer system.

### ➤ Service via ISDN

The analysing system can be checked any time and location independent via ISDN.



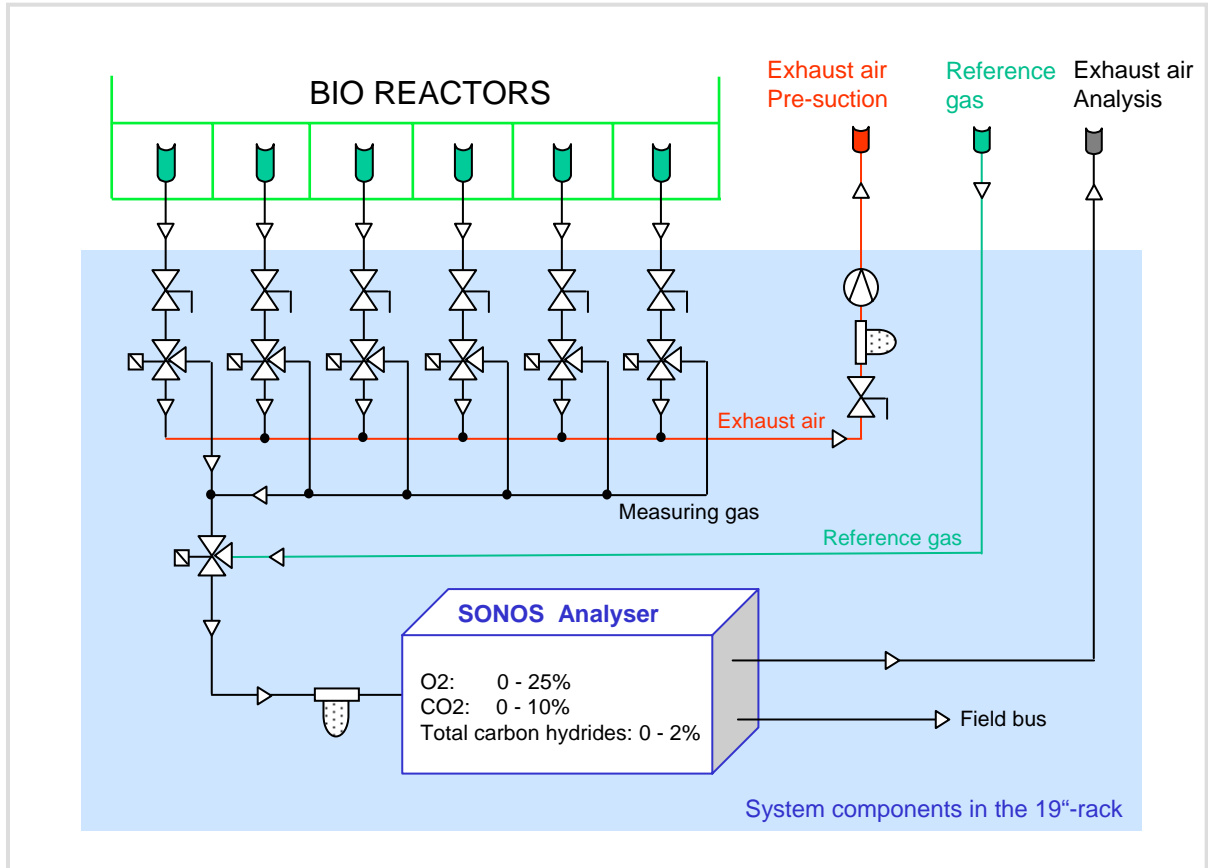
Condition measuring of gas. Process visualizing with Lab View\* on a PC connected. (\*Trade mark of National Instruments)



SONOS analysing system in the 19" rack with analytic-case, metering valves, control and adjustment



Integration of the analytic in a cassette with plug-in-connections. Ease of service and maintenance is achieved hereby.



**Configuration: SONOS gas analysing system at the bio reactor**

### Technical Data

Components to be measured	Oxygen	Carbon dioxide	Carbon hydride
Material of the parts touching gas	PTFE and refined steel	PTFE and refined steel	PTFE and refined steel
Measuring gas connection	1/8" clamping ring Pipe connection	1/8" clamping ring Pipe connection	1/8" clamping ring Pipe connection
Calibration	With reference gas	With reference gas	With reference gas
Calibration Size	VOL %	VOL %	VOL %
Measurement range	0-25% and 0-1%	0-10% / 100%	0-2%
Measurement accuracy	± 2% of measurement range selected	± 3% of measurement range selected	± 3% of measurement range selected
Linearity	≤ 0,2% of measurement range selected	≤ 0,3% of measurement range selected	≤ 0,3% of measurement range selected
Repeatability	≤ 0,2% of measurement range selected	≤ 0,4% of measurement range selected	≤ 0,4% of measurement range selected
Zero drift/week	1% of measuring span	1% of measuring span	1% of measuring span
Range drift/week	1% of measuring span or 500ppm. The higher value applies.	1% of measuring span	1% of measuring span
Gas temperature	5 – 40°C	5 – 40°C	5 – 40°C
Measurement gas admission pressure	20 – 500mbar	20 – 500mbar	20 – 500mbar
Quantity of measurement gas	adjustable 20ml-40l/h	adjustable 20ml-40l/h	adjustable 20ml-40l/h
Response sensitivity	1% of measuring span	1% of measuring span	1% of measuring span
Pick up time	3sec	5sec	5sec
Adjusting time T 90	10 – 30sec	10 – 30sec	10 – 30sec