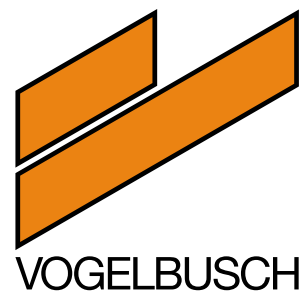
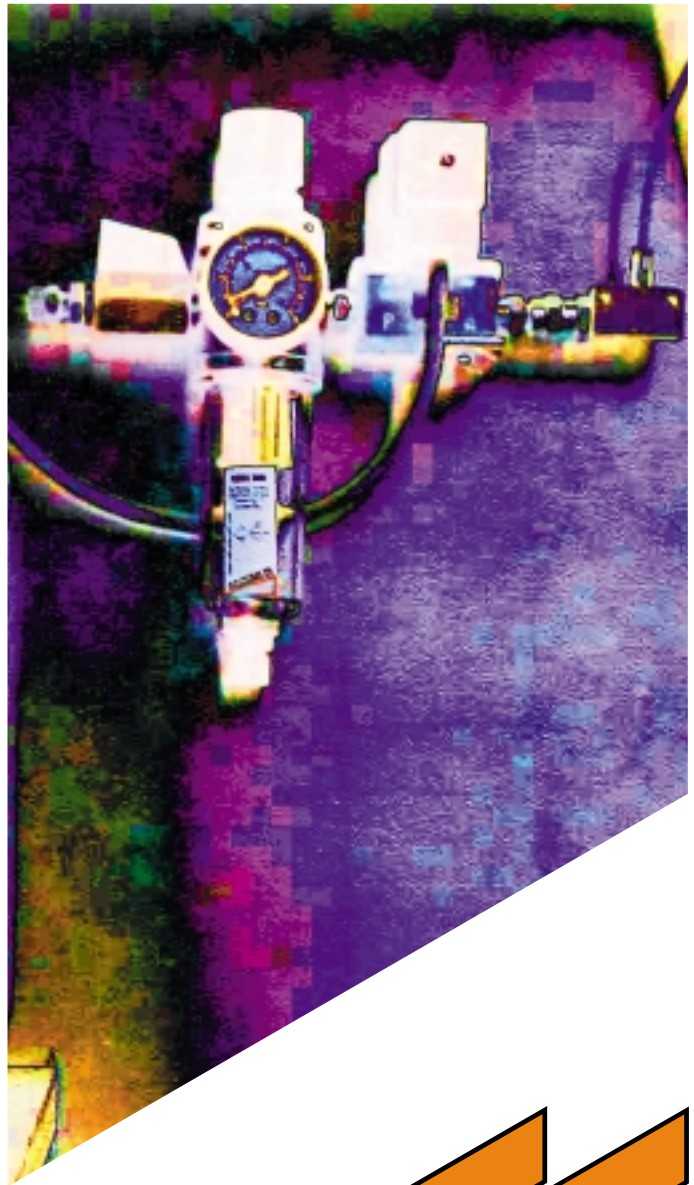


# GS 2/7

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# alcohol analyser

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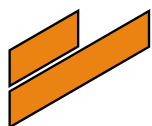
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## Vogelbusch GS 2/7 alcohol analyser

*This gas analyser was developed for reliable on-line detection of ethanol during aerobic yeast fermentation, but it can also be used for other combustible organic materials such as methanol detected and evaluated during pichia yeast fermentation.*

*In addition to the GS 2/7 Vogelbusch provides different types of alcohol analysers which are used also in the alcohol and vinegar industry.*



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### General

The GS 2/7 is a further development of previous designs, and is characterised by the use of standard industrial electronic components, thus ensuring optimum availability with minimum maintenance.

It is designed to operate as a stand-alone field instrument with all necessary process values (ethanol concentration, sensor resistance and temperature) being displayed locally at the instrument, however the main objective is communication with a central switchboard (process control system or flow controller) by a linearised, standardised signal.

### Function

Exhaust air from the fermenter is aspirated to the gas analyser by air jet pump, thus eliminating mechanically moving parts.

Detection of organic material such as ethanol is performed by a semiconductor sensor element, with changes in the concentration of the organic material causing a change in the electrical resistance.

The logarithm of the resistance is inversely proportional to the concentration of the organic matter in the gas and can thus be converted to the corresponding (ethanol) concentration. The signal is automatically temperature-compensated.

Linearisation of the sensor signal is performed by a calculating multifunction unit according to calibration data which is pre-installed in the instrument as standard.

The linearised signal is converted to a standardised current signal (4 - 20mA) which is displayed locally as (ethanol) concentration on the instrument and can be used as an input signal for any process control system or flow controller (remote set-point operation).

As an additional feature, the instrument's multifunction unit can serve as an independent flow controller for molasses feed linked to ethanol concentration by a built-in controller function. This function can be activated on request (standard design).

New calibration data can be easily transmitted to the multifunction unit.

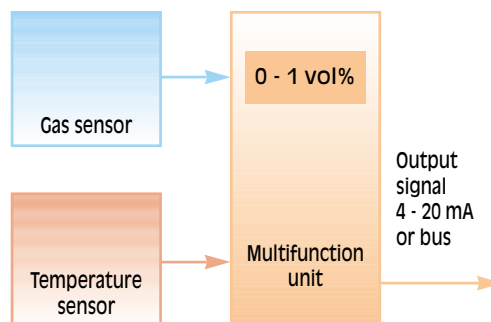
### Installation

The GS 2/7 is designed as a field instrument in the vicinity (< 5 m) of the fermenter exhaust gas pipe.

Necessary provided services:

- 230 V power supply
- 1/2" welding socket in the exhaust gas pipe
- Instrument air (4 bar)
- (electric connections to PCS or flow controller)

### Function diagram



### Additional features

(included in standard design scope of delivery)

#### Heat tracing

Fermentation exhaust gas is generally saturated with vapour at slightly elevated temperatures, therefore gas piping is fitted with a self-regulating heat tracing system to control condensation.

#### Automatic temperature compensation

Temperature measurement at the gas probe allows automatic temperature compensation independent of measured fermenter temperature.

#### Overtemperature autoprotection

When temperature at gas probe exceeds a pre-determined value set in the multifunction unit, gas flow from the exhaust gas pipe to the instrument is blocked and the semiconductor sensor is provided with ambient air.

This prevents entrance of condensate and consequential damage in the event of the instrument not being shut off manually during CIP or steaming. Normal operation continues automatically as soon as temperature falls back below limit value.

#### Foam entrance auto-protection

The GS 2/7 detects foam or liquid entrainment in the exhaust gas directly at the gas sampling point and, in such cases, shuts off automatically (emergency shutoff) to prevent any damage.

### Supplementary services

The sensors used are extremely stable, with a design service life of several months. In the event of sensor replacement, calibration of the new sensor for precise operation can be carried out on site by the operator or, alternatively, precalibrated sensors can be obtained from Vogelbusch. These sensors are delivered ready for use (after preheating) together with new calibration data which can easily be transmitted to the multifunction unit by the operator. Calibration is performed by skilled personnel in the Vogelbusch laboratory after careful equilibration in a specific laboratory assembly.

## Specific advantages

- Easy installation and integration with existing equipment
- Applicable for any type of fermenter
- Applicable for any type of control system
- Rapid response, generally approximately 60 seconds
- No further calibration required after installation
- Local display of all process variables
- Automatic overtemperature and foam protection
- Delivered complete with heating tracing system and spare sensor
- All components of standard industrial design
- Calibrated spare sensors available (on stock)
- Low investment due to standardised components
- Flow controller function for molasses feed linked to ethanol concentration (multifunction unit) available

## Technical data:

Weight:	10 kg
Dimensions:	400 x 300 x 200 mm (H x W x D)
Power supply:	230V / 50Hz
Instrument air supply (4 bar g):	1Nm <sup>3</sup> /h
Power consumption:	approx. 100W
Operating range:	selectable 0 - 0.1 and 0 - 1 vol% ethanol
Sensitivity:	better than 0.01 vol% ethanol
Reproducibility:	approx. ±0.05 vol% ethanol
Ambient temperature:	0 - 45 °C



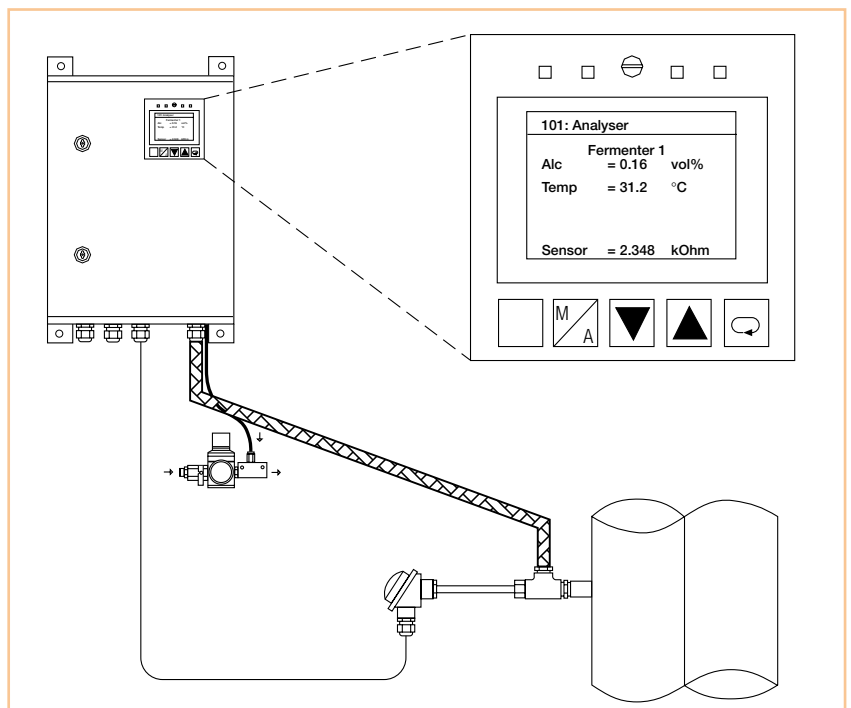
## Reference Installations

### Client

- Pliva, Croatia
- Pakmaya, Turkey
- ACFC, Kenya
- Trebisov, Slovakia
- Harmer Hefe, Austria
- Deutsche Hefe Werke, Germany
- Baxter/Immuno, Austria
- Institute of Applied Microbiology/University of Agricultural Sciences, Austria

### Application

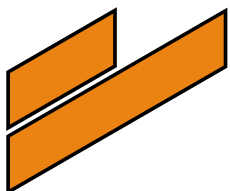
- Baker's yeast
- Baker's yeast
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- Pichia
- Pichia



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A-1050 Wien, Blechturm-gasse 11, Austria - Letters: P.O.B. 189, A-1051 Wien  
Tel.: +43 1 546 61-0 - Fax: +43 1 545 29 79  
office@vienna.vogelbusch.com - www.vogelbusch.com

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