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The FerMac 368 for measurement of microbial activity

Technical Information
FerMac 368
Gas Analyser

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FERMAC 368 GAS ANALYSER

TECHNICAL INFORMATION

The FerMac 368 Gas Analyser is designed to analyse the O_2 and CO_2 content of the exit (headspace) gas from a bioreactor.

This data refers to the Gas Analyser <u>only</u> and excludes any sampling system.

CO$_2$ Sensor

The infra-red CO_2 sensor was developed specifically for laboratory use to provide accurate and reliable determination of CO_2 gas concentrations. The wave length is selected to avoid cross-sensitivity with other gases.

Range	0-10% CO_2		
Resolution	0.01% CO_2		
Repeatability	@ 0% CO_2	=	0.05% CO_2
	@ 10% CO_2	=	0.15% CO_2
Response time	With a flow rate of 100mls/min = 50 seconds		
Temperature drift	0.1% of full scale /C		
Typical Warm up time	10 minutes		
Operating temperature range	0-45ºC		
CO$_2$ cell expected operating life	5-10 years		
Cross sensitivity	None		

O_2 Sensor

Range	0-50% O_2
Resolution	0.1% O_2
Repeatability @ 21% O_2	0.2% O_2
Response time	With a flow rate of 100mls/min = 20 seconds
Typical Warm up time	10 minutes
Operating temperature range	0-45°C
O_2 cell expected operating life	2 years in 21% O_2

Cross sensitivity:-

The O_2 cell has been tested for cross-sensitivity to a number of gases. The gas concentrations used and the response of the O_2 cell are summarised below:-

Gas	O_2 Cell Output (% O_2 equivalent)	Gas	O_2 Cell Output (% O_2 equivalent)
16% CO_2/Balance N_2	←0.01	6% CO/Balance N_2	←0.002
5% H_2 /Balance N_2	←0.001	3000ppm NO/Balance N_2	←0.002
2000ppm n-hexane/Balance N_2	←0.01		

These figures show that, of the gases tested, none show a sufficiently large cross-sensitivity to cause any inaccuracy in readings. In addition the baseline was unaffected by exposure to these gases.

Analogue Output

O_2	0-5V = 0-50% max output 10V
CO_2	0-5V = 0-5% max output 10V (10%)
Option	*4-20 mA*

Calibration Gases Required

For zero	N_2 100%
For Calibration	Typically 20% O_2, 8% CO_2, remainder N_2
	The exact calibration values are normally supplied with the gas

Sample Inlet Connection

Push connector for 6mm OD tubing

General Information

Voltage	115 or 230 VAC +/- 10% (switchable)
Instrument Size	190mm wide x 190mm high x 330mm deep
Packed Size	300mm wide x 310mm high x 410mm deep
Instrument Weight	6 kgs
Packed Weight	7 kgs

Accessories Supplied

Qty.	Item
1	Power supply cable
6 metres	Polyurethane tubing 6mm OD, 4mm ID
0.3 metres	Neoprene 3.2mm ID/1.6mm wall tubing
3	Gas inlet connector
2	Adapter, Luer, male, 3mm
1	Filter, 50mm PTFE hydrophobic
2	Fuse, 1 amp
1	Adjustment screwdriver
1	Output cable
1	T-piece, 12mm through with 6mm T (Supplied as a sample)
1	T-piece, 8mm through with 4mm T (Supplied as a sample)
1	Drying tube (Supplied as a sample - Ideal size & type will depend on application)
1	Instruction manual

Service/Spares

The FerMac 368 Gas Analyser comes with a 12 month guarantee covering all parts and labour.

A Service Contract giving a lifetime guarantee is available.

All spare parts available for a minimumm of 10 years.

Data Logging

Data Logging Using an Electrolab Bioreactor

The analogue output from the gas analyser plugs into the input/output socket of the FerMac 360 controller and the data is logged along with other data from the fermenter. Adaption cable interface cards are extra.

Data Logging Using Other Bioreactors

The analogue output from the gas analyser plugs into any spare analogue input channel.

Data Logging Using Stand-alone Software

The Electrolab eLogger is a data logging and graphing system comprising a hardware interface and software package which provides an intuitive means of logging analogue signals to your computer. The data is displayed on screen by means of a virtual instrument and a live chart display. Contact us (info@electrolabtech.co.uk) for further details.