The Tandem Family is now the affordable industry standard for dedicated exhaust gas analysis, for all lab, pilot and production applications.

TANDEM Family of Gas Analysers

Magellan | Instruments

TANDEM Family of Gas Analysers

The Tandem Family of Gas Analysers offers you sophisticated CO2 and O2 gas measurement at a similar price to your other standard probes and sensors. Formerly the reserve of expensive equipment, you can now afford dedicated, individual, on-line monitoring and control of your processes. You gain the reliability and the flexibility required in your facility. At a time of squeezed capital budgets, the Tandem fits your needs.

Tandem MULTIPLEX For facilities with several reactors where dedicated, continuous, monitoring is not required, the Mutliplex is the ideal choice. The functionality is similar to the PRO model, while it comes with a choice to connect from 6 up to 18 fermenters at one time. The cycle time between fermenters can be set by the user.

Tandem PRO The PRO model is used from laboratory through to production facilities and adds extra functionality to the TGA via a screen and microprocessor. An integrated pump aids installation where high gas flow rates are used, for example in large reactors. Manual and automatic calibrations are performed by the unit with alarms and error messages available. The output signals require no further calibration or modification in the reactor software.

Tandem TGA The attractively priced entry level model is ideal for all laboratory and pilot applications. The small footprint means it can be placed right beside the reactor making installation quick and easy. It outputs a signal to the local fermenter control system where calibration is performed and the measurements displayed - just like other standard sensors such as pH and DO.

"Dedicated on-line gas analysis is now being viewed as essential by companies, in contrast to traditional expensive multiplexed systems, such as mass spectrometers." Helix Magazine

"We needed increased process monitoring capability in order to improve development times for our contract clients. By just attaching the Tandem to our existing system, we now have increased flexibility in our GMP plant, plus have a reliable system with which to base new control strategies on."

Paul Ives, Senior Scientist, DSM Biologics, The Netherlands

Gas Analyser Benefits

The Tandem is incredible value and offers you all these benefits:

Greater understanding of your cells and processes

- Physiological state measurement on-line
- Scale-up and scale-down predictions
- Batch variation studies: feature analysis
- Metabolic flux analysis and mass-balance calculations

Increase the reliability and repeatability of your processes

- Accurate fed-batch control
- Repeatable event decisions: induction, infection, harvesting etc.
- Batch variation studies: anomaly analysis

Automate your processes

- Metabolic activity based feeding
- Repeatable event decisions: induction, infection, harvesting etc.

Dedicated, continuous, standard signals for all your reactors

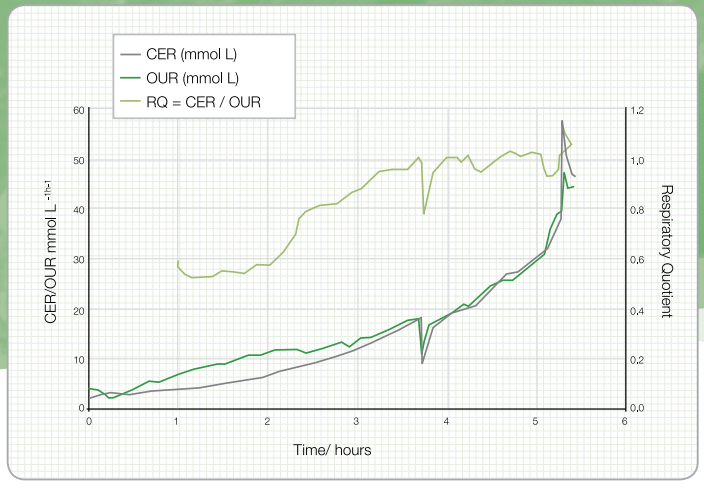
- On-line information, allows real-time calculation of RQ, CER, OUR, growth rate, KLa etc.
- 0-10V and 4-20mA, with RS232 on PRO & Multiplex
- Integrates to any reactor size (250ml – 100m^3)

TANDEM Family

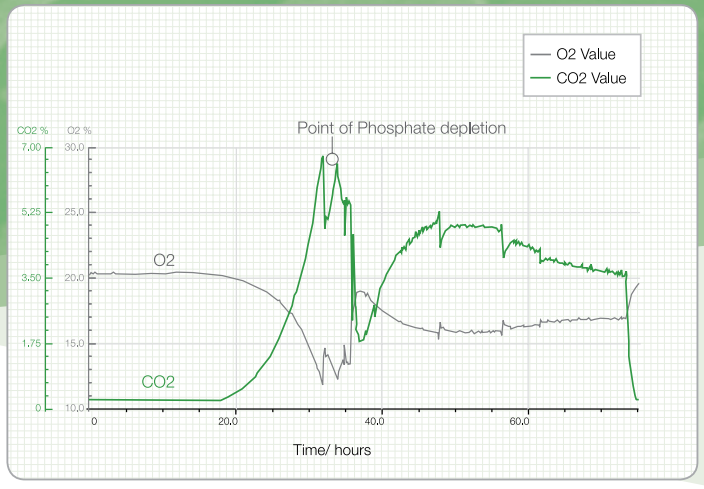
Case Studies:
Escherichia Coli Process Development

The Tandem provides fine detail on the real-time activity of the organism: the first switch in feed is clearly visible while RQ changes may reflect metabolic changes in carbon and nitrogen substrates. Automating the feed profiles from this information has optimised the process.

The example below shows how the Tandem gas analyzer was used to determine the point of phosphate depletion. There was a sharp fall in carbon dioxide and a rise in oxygen in the exhaust gas, corresponding to a metabolic event.



By kind permission of Andrew Collis, GSK Operations, Ulverston, UK



Predict metabolic events with a Tandem - UCB Group, UK- Dominic Reeks

"The Tandem is both reliable and consistent. The information gained from CO2 measurements directly correlates with product formation, and so we now use it to monitor the physiological state of our cultures."

Paul Milner, Fermentation Leader, Agrol Ltd, UK

"We use Tandems for analysis of laboratory fermentations. Using the instrument is a very easy and cost effective solution. Also, customer service has been outstanding."

David M. Anderson, Research Director, ChemGen Corp., USA

TANDEM Family of Gas Analysers

Specifications

Feature	CO2	O2
Measurement Principle	Infra Red Absorption	Electrochemical
Range	0-5%, 0-10%, 0-20%	0-30% 0-50%, 0-100%
Resolution	0.01%	0.01%
Accuracy	+-2% of full scale	+-2% of full scale
Drift	<0.05%/month full scale	<0.05%/month full scale
Operating Temperature	0 - 45°C	0 - 45°C
Temp. Compensation	Included	0.02%/°C
T90 Response Rate	<50 secs	<10 secs

Model name	No. of lines	Sampling Interval	Local Display	Calibration, with two known gases	Gas flow rate	Internal gas pump	Output	Dimensions
TGA	1	Continuous	No	Manual, on fermenter controller	25-1000 ml/min	No	Dual 0-10V and 4-20mA	250w x 260d x 170h Bench mount
PRO	1	Continuous	Yes	Manual & Automatic, on local display	25-1000 ml/min	Yes	Dual 0-10V and 4-20mA plus RS232	250w x 260d x 170h Bench mount
Multiplex	6, 8, 12 or 18	User-definable, from 30 secs	Yes	Manual & Automatic, on local display	25-1000 ml/min	Yes	RS232	320w x 260d x 410h Bench or wall mount

Installation of all systems is simple and can be done by the end-user. The exhaust gas analyser is placed after the condenser and filter. We recommend a foam trap before the analyser and, if the condenser is not efficient, a drying agent may be used (e.g. drierite.com). Connections for gases are 6mm nylon tubing gas compression fittings.

There is a one year guarantee for the systems and, depending on use, we recommend a service every 1-2 years.

Magellan | Instruments

Magellan Instruments Ltd, The Old Rectory, Church Road, Limpenhoe, Norfolk, NR13 3JB, UK
www.magellaninstruments.com sales@magellaninstruments.com