

DO Analyser



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The DO Analyser is an easy to use, PC controlled instrument for the determination of dissolved oxygen in aqueous solutions according to the method developed by L.W. Winkler in 1888.

This chemical titration method is the standard for determination of oxygen in samples, even in modern times, because all in situ systems are less accurate. The method needs well educated and experienced personnel but nevertheless produces individual results because the titration endpoint is determined by eye. Qualified personnel get very reproducible results which have an individual offset. This offset limits the accuracy to a value considerably beyond the principle accuracy limits of the method. The current trend towards increasing international cooperation and participation in joint programmes brings with it the greater need for measurement comparability.



The DO Analyser fills this gap for it works at the accuracy limit of the method, does not need experienced and qualified personnel and potentially gives error free, well-documented results on machine readable media. The acquisition, and the chemical pretreatment, of the samples prior to titration are left unchanged but the determination of oxygen by titration of the iodine with thiosulphate solution is automated.

The system consists of a robust transportable box, the software and an interface cable from the box to PC. Within the box is a motor burette, a stand with a stirrer for the sample flask, the photometer and the interface box providing, via RS 232 serial link, communication for photometer and burette with the computer.

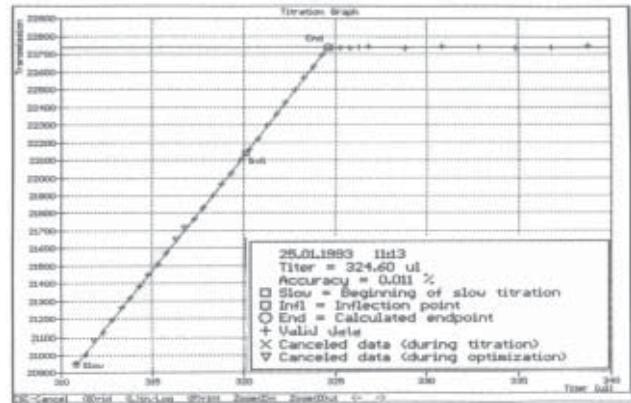
Photometer

The photometer uses a blue beam at the absorption wavelength of iodine. By use of a high resolution analog-to-digital converter the decreasing of the absorption during titration is recorded with very high precision. A red beam, which is scarcely attenuated by the iodine, is used to estimate the transmission endpoint after titration, because the transparency of the sample is then nearly identical. The light source is a multi colour solid state device (light emitting diode) with low power consumption. To prevent errors from daylight or illumination effects it is modulated.

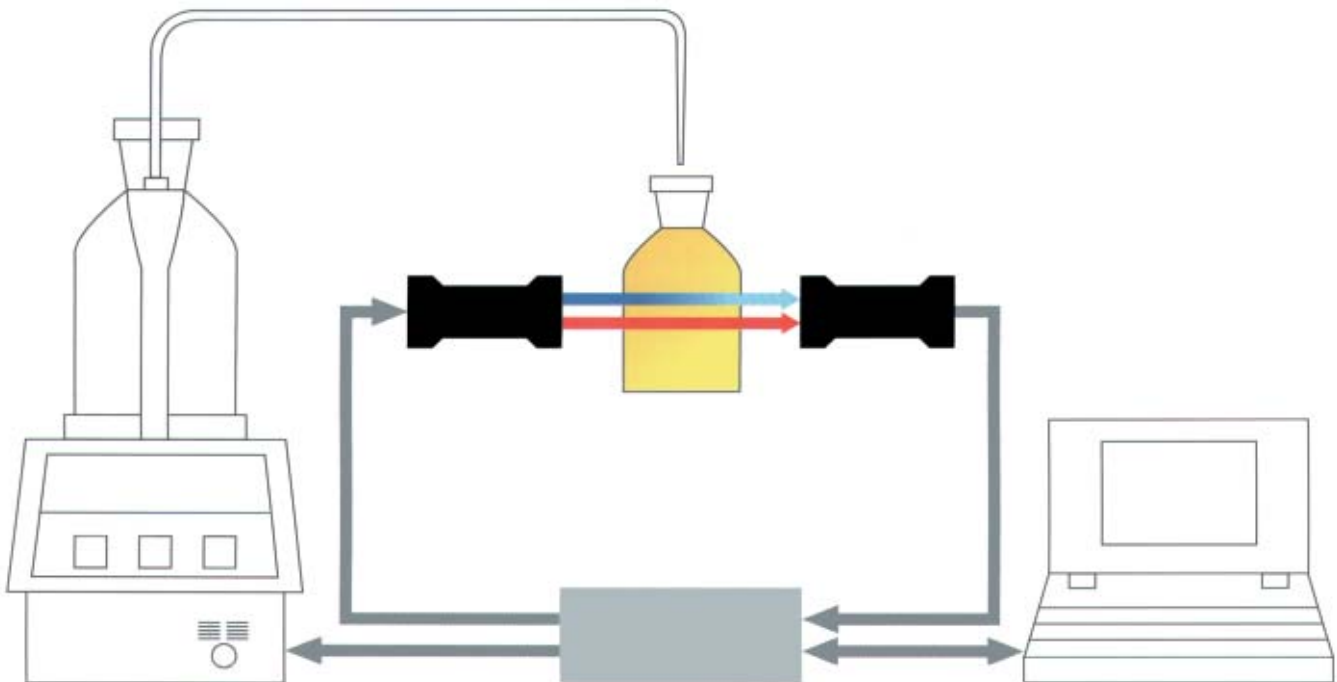
Titration Process

The titration is done in the following manner:

- Endpoint estimation by red beam
- Fast titration with decreasing titer amounts nearly up to the estimated endpoint
- Slow titration with small titer amounts until the transmission is constant
- During slow titration elimination of spurious points (eg from air bubbles)
- Endpoint calculation by approximation and optimization in the slow range
- Calculation of titration precision



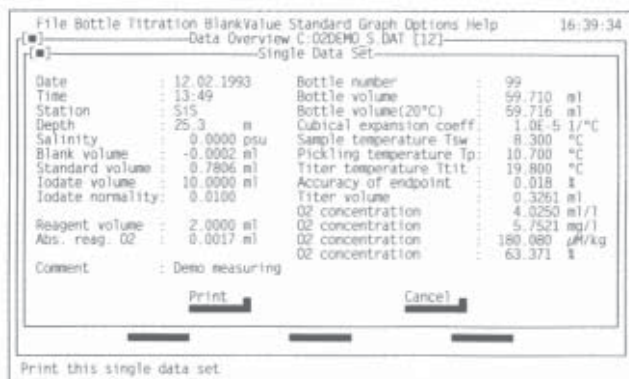
Screen shot 'Titration Graph' from DOA software



Titration Results

The system supports the calculation of dissolved oxygen concentrations according to the WOCE and ISO 5813 / EN 25 813 standards. Some WOCE features like duplicate samples and temperature corrections are also supported in ISO mode.

The results of titrations, standardizations and blank determinations with all associated data can be viewed or printed to line printer and text files.



Screen shot 'Single Data Sheet' from DOA software

Technical Specifications

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Dimensions:	43 x 54 x 41 cm (w x h x d) 17 x 21 x 16 in. (w x h x d)
Weight:	20 kg, 44 lb.
Voltage:	120 and 240 V AC
Frequency:	50 . . . 60 Hz
Consumption:	20 VA
Ambient temperature:	+5 . . . +40 °C
Storage temperature:	-40 . . . +70 °C
Burette:	Metrohm 765 Dosimat
Exchange unit:	1, 5, 10, 20 or 50 ml
Accuracy:	Abs. 0.3 % Rep. 0.1 %
Photometer:	Alternating light photometer operating with two wavelengths 15 Bit ADC

Features

Menu driven user interface
Context sensitive help
Optional mouse control
Selectable ports for hardware
and printer
Different burette fill speeds
Monochrome and colour display
English and German language
Hardware and transmission test
functions
Support of WOCE and ISO 5813
standards

System Requirements

System:	IBM® PC/XT/AT or true compatible
Operating system:	MS-DOS® 3.10 or higher
Processor:	Minimum 8088, preferred 80286
Memory:	640K (minimum 448K free memory)
Drives:	Any with 1 MB free disk space; Hard disk preferred
Video card:	MDA (Hercules® monochrome), CGA, EGA, VGA or MCGA
Serial ports:	One 8250 based RS 232 C interface (Two for use of serial mouse)
Optional:	One Centronics® interface for Epson®-FX compatible line printer Coprocessor Mouse with Microsoft® compatible mouse driver

Temperature corrections for
volumes and normality
Duplicate samples
Optimizing algorithms for
endpoint detection
Calculation of titration precision
Graphic display of titration curve
Printer output
Convenient data management for
bottles, standardization, blank
determination and titration data

Demo version with tutorial available

SiS reserves the right to change
specifications without prior notice



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