

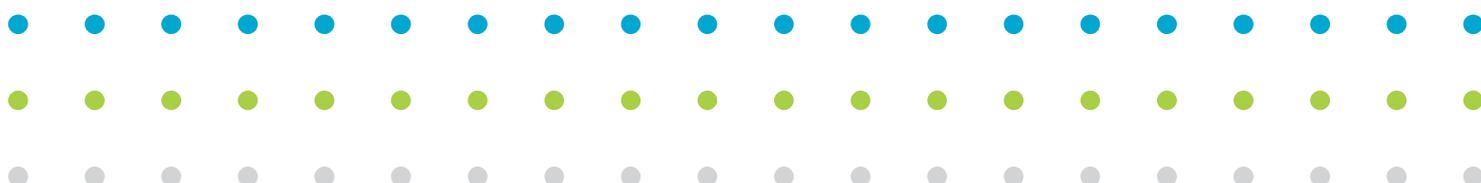


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AUTOMATIC OXYGEN ANALYZER FOR BLISTERS

AUTOMATIC O₂ ANALYZER B-O2

FOR MAP PACKAGING IN PHARMACEUTICAL AND FOOD & BEVERAGE APPLICATIONS

B-O2: Fully automatic optical O₂ analyzer for determination of oxygen concentration in blister packs and other MAP packaging for pharmaceutical industry in quality control and production lines. The analyzer can analyze 1-6 blisters at once, with up to 72 measuring points in one serial measurement. Device is compliant to pharmaceutical standard, **21 CFR Part 11** and Industry 4.0.

Applications

Applications B-O2

- O₂ concentration in blister packs. Measuring 1-6 blisters at once, with up to 72 measuring points in one serial measurement.



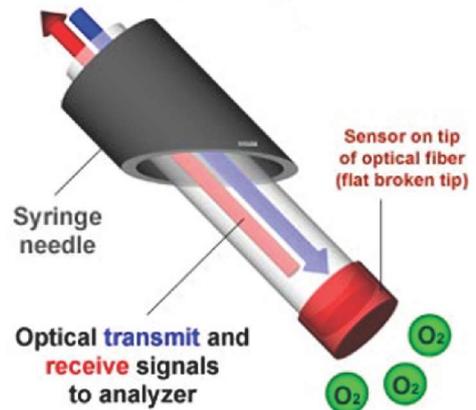
Principles

Optical sensors with optical transmitter installed combined with intelligent software instantly measure the O₂ concentration in very small headspaces.

Devices provide reliable, accurate and reproducible analysis that eliminates the possibility of human errors. The measuring procedure is simple, fast and efficient. The user interface is designed for easy operation. The operator selects the required type of analysis, i.e. single point analysis or serial measurements. Statistical analysis report is automatically generated by the software, compliant to **21 CFR Part 11**. Special designed cartridges enable fast and precise measurements of different types of blisters.

Advantages

- Measurements in headspace;
- No sample extraction;
- High accuracy;
- No O₂ consumption during measurements;
- Automatic calibration;
- **IQ & OQ** documentation;
- **21 CFR Part 11 compliant**;



Optical O₂ sensor

Technical specifications

- Needles Ø: 0.4 mm, 0.8 mm;
- Measuring range: 0–25 % O₂;
- Accuracy: ±0.1 % O₂;
- Limit of detection: 0.1 % O₂;
- Operating temperature range: 5–40 °C;
- High precision positioning: < 0.02 mm;
- Interface: USB, RS485, Ethernet;
- Dimensions: 500 × 400 × 360 mm (l x w x h);
- Weight: 35 kg;
- Level of protection: IP 10;
- Power supply: 120 V-260 V AC / 47-63 Hz;
- Required gases for calibration:
 - Synthetic air with 20–21 % O₂,
 - Nitrogen 4.5, 5.0.

ECHO Instruments B-O2 software



PORTABLE OXYGEN ANALYZERS IN MAP PACKAGING

HAND O2 & FOOD O2

FOR MAP PACKAGING IN PHARMACEUTICAL AND FOOD & BEVERAGE INDUSTRY

Hand O2 & Food O2 devices are used for determination of oxygen concentration in headspace in various MAP packaging (MAP – modified atmosphere packaging). Micro-invasive measurements are enabled by optical sensor tips smaller than 140 μm . Devices are compliant with pharmaceutical standards and **21 CFR Part 11**.

Principles

Optical sensors with optical transmitter combined with intelligent software instantly measure the O_2 concentration in very small headspaces.

Applications

- Pharmaceutical: O_2 concentration in blisters, vials, tubes, patches, sealed bags, etc;
- Food & Beverage: O_2 concentration in coffee, meat, dairy products, all MAP packaging;
- Science: Biotechnology, Micro-respirometry, marine research, R & D.



Advantages

- Measurements in gas or liquid phase;
- No sample extraction;
- High accuracy;
- No O₂ consumption during measurements;
- Salinity factor input for different salinity samples in vials;
- IQ & OQ documentation;
- Sterilizable sensors;
- Calibration is fast and can be performed by the user;
- Battery or regular power supply;
- Measuring range: 0–25 % or 0–100 % O₂;
- Accuracy: ±0.4 % at 20.9 % O₂ or ±0.05 % at 0.2 % O₂;
- Temperature measurement range: 0–50 °C;
- Response time (t₉₀) < 15 sec;
- Calibration: 2-point calibration using nitrogen and synthetic air;
- Dimensions: 180 × 90 × 270 mm, Weight: 1 kg;
- Interface: USB, RS485, Ethernet;
- Needles Ø: 0.4 mm, 0.8 mm.

ECHO Instruments HAND O2 & FOOD O2 software

Measurements :

O2: 20.19 % O2[avg]: 14.13 %
O2: 8.432 mg/l O2[avg]: 5.90 mg/l
T: 19.98 °C p: 979 mBar

Data logging: ON OFF
 Location : USB SD card
 File name : 06062022Log
 Interval : 1 min sec
 Salinity : 0 ppt

Secondary units:
 hPa Torr Air saturation %
 mg/l ppm µmol/l
 10 : measurements average

Status : Select next position

| | | | | |
|-------------------|-------------------|-------------------|-------------------|--------------------|
| No.2 O2: 0.0 % | No.4 O2: 4.6 % | No.6 O2: 0.0 % | No.8 O2: 0.0 % | No.10 O2: 0.0 % |
| No.1 O2: 7.6 % | No.3 O2: 0.0 % | No.5 O2: 0.0 % | No.7 O2: 0.0 % | No.9 O2: 0.0 % |

O2 : 0.00
T : 20.0°C

Next blister
Print report
Exit

Status : Measurements in vial 1 in liquid are finished

| | | | |
|---|--------------------------|------------------|-----------------|
| Headspace O2: 0.0 % Liquid O2: 0.001 ppm | Vial | O2 | O2[vial] |
| | | Current | Average |
| | Headspace : 0.0 % | 0.0 % | 0.0 % |
| Liquid : 0.001 ppm | 0.001 ppm | 0.001 ppm | |

O2:0.00 % O2:0.001 mg/l
T:20.2°C p:989mBar

Next
Finish

Status : Measurements in tube 1 are finished

| | | | |
|------------------|---------------|--------------|-----------------|
| O2: 0.0 % | Tube : | O2 | O2[tube] |
| | | Current | Average |
| | 0.0 % | 0.0 % | 0.0 % |

O2:0.02 % O2:0.010 mg/l
T:20.2°C p:988mBar

Next
Finish

INSTRUMENTS FOR BIODEGRADATION MEASUREMENTS

SOLID / LIQUID / AEROBIC / ANAEROBIC

Respirometer is a device that measures respiration of living organisms. Respirometer determines aerobic or anaerobic biodegradability of solid, liquid and algae samples in various applications. The system measures O₂ and CO₂ concentration in flow through the sample under controlled conditions. Flow, temperature, pressure, humidity are also measured continuously. Software automatically calculates **CO₂ production** and **biodegradation %**. Additional gases can also be measured.

Applications

- **ISO 14855-1, ASTM D 5338**; Aerobic biodegradability of plastics in compost;
- **ISO 14852**; Biodegradability of plastics in aqueous medium;
- **ISO 17556**; Biodegradability of plastic materials in soil;
- **ASTM D6691**; Marine degradation, **OECD 301 B**, etc;
- Sea and lake sediment biodegradability tests;
- Sludge measurements;
- Organic waste biodegradation measurements;
- Insects and small animals respirometry;
- Food respiration, R&D in plastics, biotechnology, ecology, pharmacy, packaging, etc;
- **¹³C Isotope** measurements (with additional **δ¹³C** analyzer).

Advantages

- Modular design (upgradable);
- On-line biodegradation measurements;
- Plug & Play system;
- Aerobic or anaerobic measurements;
- 12 / 24 / 36 / 48 / 60 channel systems;
- Laboratory or industrial use;
- MFC (mass flow controller) for each channel;
- Various flow configurations;
- Flow leakage alarm;
- Automatic humidification;
- Multitube cable connections;
- Customizable;
- O₂ and CO₂ sensors installed;
- Optional sensors: CH₄, H₂S, H₂, NH₃;
- Temperature range +3...+70 °C;
- Air source (compressor) included;
- Internal air supply connection;
- Various sizes of vessels;
- Vessels with illumination;
- No special connections required;
- Remote control software;
- Data export in MS Excel;
- Calculation of CO₂ production;
- Calculation of biodegradation %.



12 channel Respirometer

Technical specifications

● Dimensions – Control units:

- 12 channel respirometer: 60 × 60 × 60 cm;
- 24 channel respirometer: 60 × 60 × 120 cm;
- 36, 48 & 60 channel respirometer: 60 × 60 × 200 cm;

● Dimensions – Thermostatic chambers:

- 12 channel respirometer: 60 × 60 × 150 cm;
- 24 channel respirometer: 80 × 80 × 200 cm;
- 36 channel respirometer: 150 × 86 × 200 cm;
- 48 & 60 channel respirometer: 150 × 86 × 200 cm (2x);

- O₂ and CO₂ sensors (additional sensors on request);

- MFC ± 1.5 % full-scale: 0–200 mL/min, 0–500 mL/min or 0–1000 mL/min;
- Connecting multicore cables;
- Vessels for solid samples: 2.8 L;
- Vessels for liquid samples: 250–1000 mL;
- Vessels for algae samples (controlled LED lighting): 1000 mL.



60 channel Respirometer



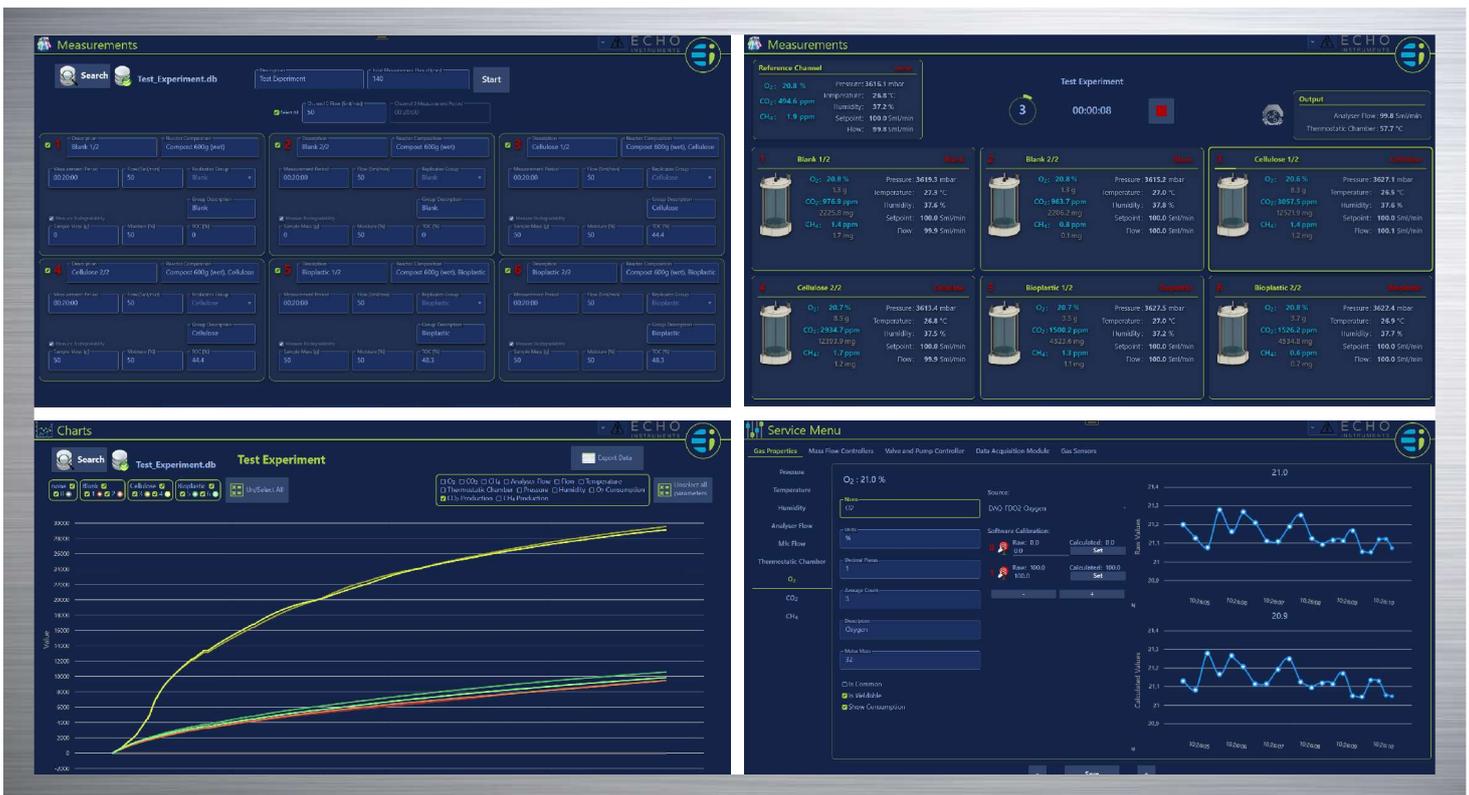
Vessel for solid samples



Vessel for liquid samples

Vessels

ECHO Instruments ER respirometer software





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