

**Environmental Technology**



## **Respirometer**

**BSBdigi - O<sub>2</sub>**

**BSBdigi - CO<sub>2</sub>**

## **Description**

## ***BOD Measuring System BSB digi***

***The system can be universally used and is well suited for routine measurement of BOD values in sewage plants, factories and water monitoring facilities as well as in research centers.***

***The system complies with the „German standard for the investigation of water, waste water and sludge“ ( DIN 38 409 - H 52 ) and can also be employed for investigations beyond this standard.***

## ***Applications***

***Apart from routine determination of biochemical oxygen demand, the BSB digi system can also be used for:***

- ◆ the determination of BOD<sub>5</sub> (acc to. DIN EN 1899-2, 1998-05 DEV H 52)***
- ◆ decomposition tests in water and soil (mineral oils, hydrocarbon chlorides)***
- ◆ toxicity tests***
- ◆ the determination of biological activity of different substrates ( e.g. compost, seeping water on dumps)***
- ◆ respirometric measurement***

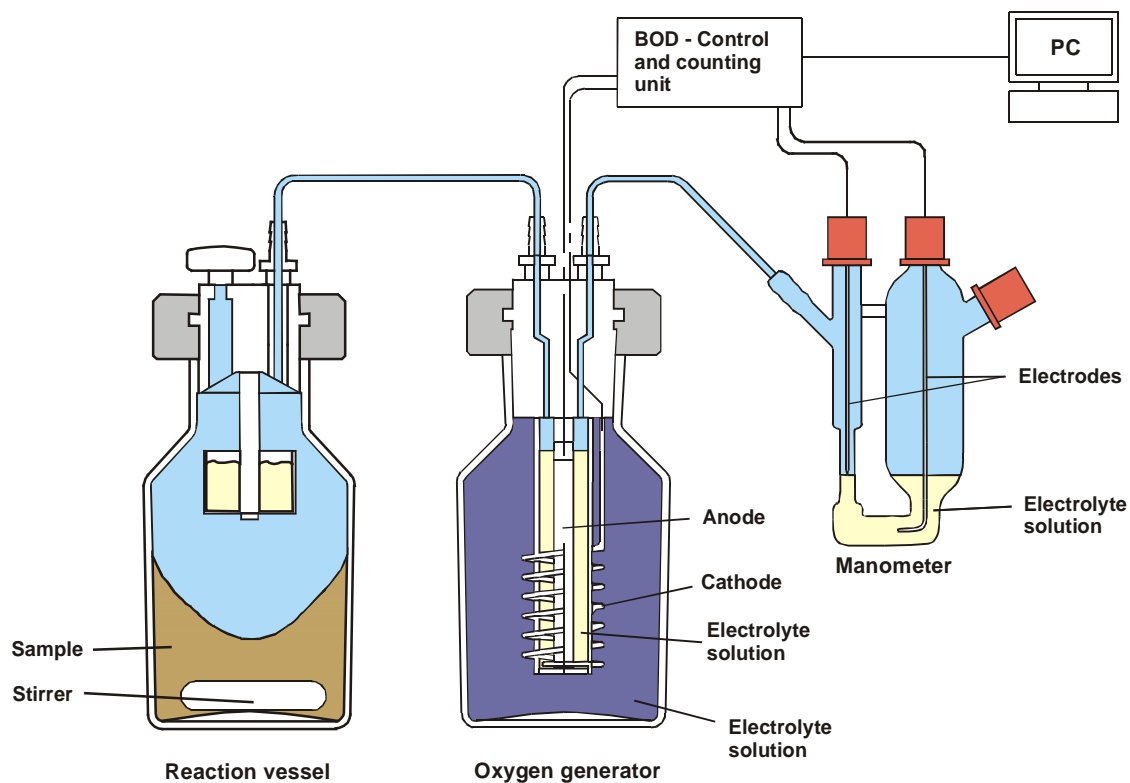
***Many other applications are possible and thinkable. Our experts will be with pleasure at your disposal for further information.***

## ***Advantages***

- ◆ The compact construction requires little surface space***
- ◆ By a continuous balance of consumed oxygen, a very high oxygen depletion can be detected without sample dilution***
- ◆ Tempering is carried out in air, thus no corrosion and no creeping current***
- ◆ The oxygen consumption can be registered for any random time intervals, thus an affirmative consumption curve is always possible***
- ◆ thank to its modular design, the BSB digi system can be extended to up to more than 100 measuring points. This allows individual adaption of the system to the requirements of the user***
- ◆ high pressure constancy***
- ◆ no stress for bio- organism***

## Operation principle

The operation principle of the system is based on the direct method and the coulomb-metric oxygen measurement. A sample is agitated in the reaction vessel with a magnetic stirrer so that it absorbs oxygen to the point of saturation. The resulting carbon dioxide is bound by an absorbing agent. These processes give rise to a partial vacuum which, in turn, controls the electrolytic generation of oxygen via a contact pressure gauge. A precise time control switches the oxygen generator on for a certain time until a defined amount of oxygen has been generated ( $1 \text{ mg / L O}_2 = 1 \text{ mg / L BOD}$ ). The sum of all BOD values is registered at the measuring insert or added and stored for each measuring point via computer control system. The stored data can then be displayed on the screen in form of tables or graphics, or printed.



**Scheduled diagram of the principle of BSB digi**

## Software

**BSBdigi software allows you to gather and process BSB-data of the BSBdigi instruments of the SELUTECH GmbH.**

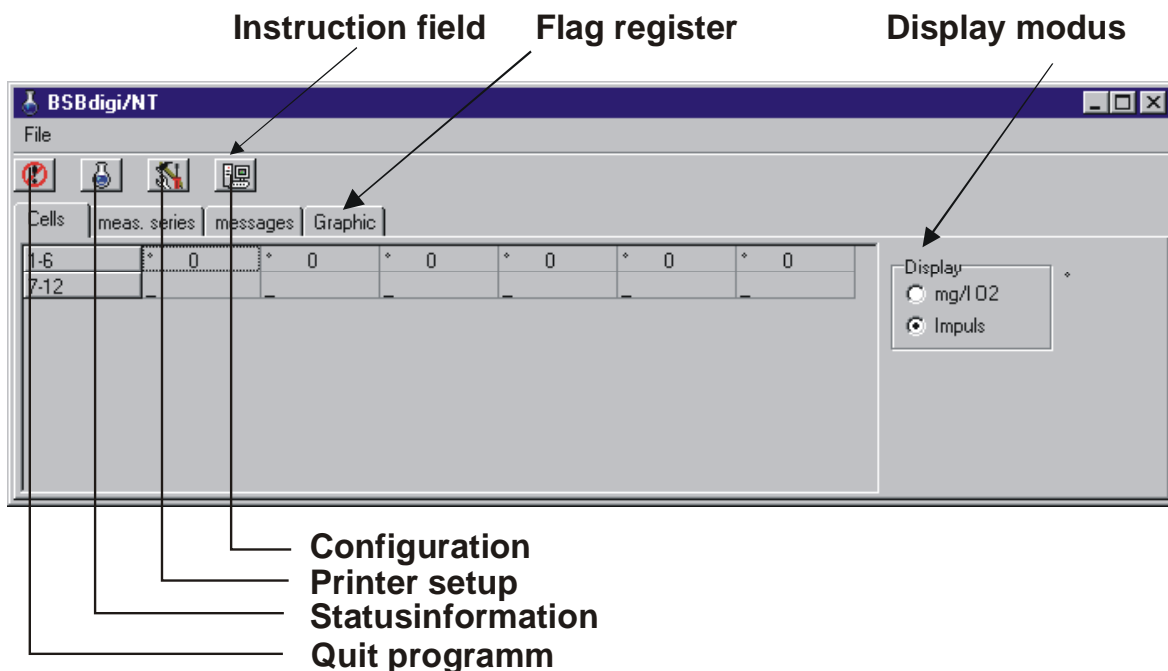
**BSBdigi works with menus and windows. You can use the mouse and / or the keyboard. The user interface is easy and fast to learn, so even occasional users can work with it.**

**Several cells of a measurement can be combined in a measuring series, for which the oxygen consumption is measured in a fixed time interval over a certain time. On the monitor you can observe the current values at any time. The chronological course of the oxygen demand can be shown or printed in form of a table or graphics.**

**Important events as the start or the end of a measuring series will be recorded. You can also add your own notes to the protocol.**

**A screen saver program can be activated at your own timing.**

**You can store your data within BSBdigi in different formats (for example EXCEL, QuattroPro) on a disk for further evaluation.**



**figure 1: display structure of BSBdigi**

## **Description of the system**

*Thanks to the modular design of the BSB digi system it can be combined in many ways. The single components are described in more detail below.*

### **BSB-digi Basic unit**

*The standard BSB digi basic device consists of 6 units. The magnetic stirrers are driven by an electric drive.*

*The basic unit can be used as a single system, or several basic devices of 6 units can be mounted one above the other with corresponding racks and telescope systems.*

*The versions with sample vessels 3 x 2 ltr. / 3 x 5 ltr. And larger oxygen vessels are based on the standard system.*

### **Sample Measuring System**

*The sample measuring vessel contains the sample. The sealing stopper has corresponding connectors for the tubing of the oxygen vessel and holds the CO<sub>2</sub> absorber. Soda lime is used as absorbing agent for CO<sub>2</sub>.*

*Vessel standard volume 500 ml for 250ml sample.*

*Available vessels: 250 ml, 1.000ml, 2.000ml and 5.000ml.*

### **Oxygen vessel**

*Oxygen is generated by electrolysis in the oxygen vessel. The complete electrolysis part is attached to the sealing stopper for the vessel. Cupric sulfate is used as electrolyte. The system can be completely sealed against the outer pressure in order to ensure that no other gases are generated except oxygen.*

### **Precision Manometer**

*The precision manometer is made of glass and has two stainless steel electrodes. The switch electrode has a pointed tip and is centered in a capillary immersion tube which is open at the bottom. This immersion tube reaches into the electrolyte reservoir with which it forms a communicating tube. The immersion tube has a connection to the oxygen generator. A low-conductive H<sub>2</sub>SO<sub>4</sub> solution is used as electrolyte. Both electrode connections are made via flexible lines to the collective plug output.*

## ***BSB-digi Measuring insert***

***For each measuring point a BSB digi measuring control unit is required for the exact current of the oxygen vessel . These inserts are wired in the basic unit. Each can house 6 BSB digi places and includes the clock-pulse module for these 6 inserts. The required stabilized power unit is located in the control unit of the thermostated cabinet. For communication with the computer only one USB communication cable is needed. Each BOD value is registered in the RAM of the microprocessor counter which is integrated in the measuring insert. At the same time, the measured values are logged into the computer. In case of power failure the datas are stored in the RAM for more than one day.***

## ***Thermostated Cabinet***

***The thermostated cabinet ensures an exact reference temperature of 20°C ( ± 0,5°C ) and has room for max. 18 measuring points (500 ml vessel). The BSB digi basic units are mounted on telescope systems for comfortable operation. The plug connections to the computer system are led out or are at the outside.***

## ***BSB-digi Computer System***

***For automatic measuring operation of the system it is recommendend to use a suitable personal computer. The standard PC which is delivered with the system has the following configuration:***

***IBM compatible, Pentium computer,  
64 MB RAM, 10,0 MB free on fixed disk,  
CD-ROM, VGA graphic card,  
USB  
WIN 98 and upward all versions***