OPERATING MANUAL

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OxiTop®-i
OxiTop®-IDS

MEASURING HEADS FOR BOD DETERMINATION (RESPIROMETRIC TEST PROCEDURE)

WTW

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Index

1 Overview 5
1.1 Measuring system OxiTop® 5
1.2 Measuring heads OxiTop®(-i/-IDS) (variants) 5
1.3 Measuring principle 6
1.4 Operation of the measuring heads 6
1.5 Supporting functions for BOD measurements 7

2 Safety 8
2.1 Safety information 8
2.1.1 Safety information in the operating manual 8
2.1.2 Safety signs on the meter 8
2.1.3 Further documents providing safety information 8
2.2 Safe operation 9
2.2.1 Authorized use 9
2.2.2 Requirements for safe operation 9
2.2.3 Unauthorized use 9

3 Commissioning 10
3.1 Scope of delivery 10
3.2 Power supply (OxiTop® measuring heads) 10
3.3 Initial commissioning 10

4 Operation 11
4.1 General operating principles 11
4.1.1 Display 12
4.1.2 Status information 12
4.2 Navigation 13
4.2.1 Operating modes 13
4.2.2 Menus and dialogs 13
4.2.3 Elements in menus and dialogs 14
4.2.4 Example on navigation: Setting the language 14
4.2.5 Example on navigation: Setting the date 15
4.3 BOD determination 16
4.4 Measuring (example: BOD determination) 16
4.4.1 Preparing the measurement 16
4.4.2 Starting the measurement 18
4.4.3 Displaying measurement data 19
4.5 Calibration 20

4.5.1 OxiTop®-PM (Cal-Test) 21
4.5.2 OxiTop®-PT (pneumatic test). 21
4.6 Settings 22
4.6.1 Measurement settings 22
4.6.2 System settings 23

5 Maintenance, cleaning 25
5.1 Maintenance 25
5.1.1 Exchanging the battery 25
5.2 Cleaning. 26
5.2.1 Measuring head 26
5.2.2 Sample bottles 26
5.3 Packing 27

6 What to do if... 29

7 Technical data 31

8 Disposal 34

1 Overview

The measuring heads OxiTop®(-i/-IDS) are part of the OxiTop® measuring system for BOD determination and pressure measurement.

1.1 Measuring system OxiTop®

The OxiTop® measuring system consists of the following components:

- Stirring platform IS 6, IS 12, IS 6 VAR
- Sample bottles
- Measuring head OxiTop®(-i/-IDS)
- Only for the measuring heads OxiTop®-IDS:
  IDS meter with MultiLine OxiTop® IDS software for wireless operation of the OxiTop®-IDS measuring heads

1.2 Measuring heads OxiTop®(-i/-IDS) (variants)

figure 1-1 OxiTop®(-i/-IDS) variants

1 OxiTop®-i B (blue)
2 OxiTop®-i G (gray)
3 OxiTop®-IDS (orange)
4 OxiTop®-IDS /B (orange/gray)

Measuring heads (variants)

Characteristics	OxiTop® variants		
	-i	-IDS	-IDS /B
Color	Gray or blue	Orange	Orange/ gray
Operating elements (display and keys)	x	x	
Wireless operation		x	
Transmitting measurement data		x	
Suitability for biogas			x
Max. measured values	7	360	
Max. measuring duration (days)	7	180	

1.3 Measuring principle

BOD determination with the OxiTop® measuring system is based on pressure measurement (difference measurement). The recording of the measured values is done by means of pressure measurement via piezo-resistive electronic pressure sensors.

1.4 Operation of the measuring heads

Operating elements of the measuring heads

All OxiTop®(-i/-IDS) measuring heads can be operated with the operating elements at the measuring heads (details: see present operating manual).

Wireless operation

Additionally, the OxiTop®-IDS measuring heads can be connected to a meter wirelessly via the WLM system. The meter must be equipped with the BOD software MultiLine OxiTop® IDS.

As soon as the measuring heads are connected to the meter wirelessly via the WLM system, you can operate several measuring heads conveniently and simultaneously.

With the meter, several additional options for evaluation, processing and output of measurement data are available (e.g. output to a USB memory device or a PC).

Details on the wireless operation of the OxiTop®-IDS measuring heads via a meter is given in the "MultiLine OxiTop® IDS operating manual for Multi 3630/3620 IDS".

The general functions of the meter, e.g. transmitting measurement data to a PC, are described in the operating manual of your Multi 3630 IDS or Multi 3620 IDS meter.

1.5 Supporting functions for BOD measurements

To reduce the measuring work and costs, the OxiTop® measuring system is especially adapted to the procedures of respirometric BOD measurement by means of the following functions:

Function	Explanation
AutoTemp	Function to control the temperature adjustment. Measurement is started automatically (at least 1 hour, at most 3 hours after the OxiTop® measuring head is started). Pre-tempering the samples to exactly 20°C is not required. The samples can be inserted with a temperature in the range of 15°C ... 21°C. The *AutoTemp* function takes over the temperature control.
Measured value memory	OxiTop®-i: Automatic measurement with daily measured value recording for 7 days: OxiTop®-IDS: Automatic measurement with daily measured value recording for 180 days: The setting of more than 7 measured values is only possible via the wirelessly connected meter.
Momentary value	Display of the current measured value in the selected unit at any time during a measurement.

2 Safety

2.1 Safety information

2.1.1 Safety information in the operating manual

This operating manual provides important information on the safe operation of the instrument. Read this operating manual thoroughly and make yourself familiar with the instrument before putting it into operation or working with it. The operating manual must be kept in the vicinity of the instrument so you can always find the information you need.

Important safety instructions are highlighted in this operating manual. They are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "CAUTION") indicates the danger level:

WARNING
indicates a possibly dangerous situation that can lead to serious (irreversible) injury or death if the safety instruction is not followed.

CAUTION
indicates a possibly dangerous situation that can lead to slight (reversible) injury if the safety instruction is not followed.

NOTE
indicates a possibly dangerous situation where goods might be damaged if the actions mentioned are not taken.

2.1.2 Safety signs on the meter

Note all labels, information signs and safety symbols on the meter and in the battery compartment. A warning symbol (triangle) without text refers to safety information in this operating manual.

2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the measuring system:

- Operating manuals of further accessories
- Safety datasheets of calibration- or maintenance accessories

2.2 Safe operation

2.2.1 Authorized use

The authorized use of the OxiTop®-IDS measuring system is exclusively the respirometric determination of the Biochemical Oxygen Demand (BOD) according to the self-monitoring procedure, as well as additional respirometric test procedures.

Only the operation and running of the instrument according to the instructions and technical specifications given in this operating manual is authorized (see section 7 TECHNICAL DATA, page 31).

Any other use is considered unauthorized.

2.2.2 Requirements for safe operation

Note the following points for safe operation:

- The instrument may only be operated according to the authorized use specified above.
- The instrument may only be supplied with power by the energy sources mentioned in this operating manual.
- The instrument may only be operated under the environmental conditions mentioned in this operating manual.
- The instrument may only be opened if this is explicitly described in this operating manual (example: Inserting the batteries).

2.2.3 Unauthorized use

The instrument must not be put into operation if:

- it is visibly damaged (e.g. after being transported)
- it was stored under adverse conditions for a lengthy period of time (storing conditions, see section 7 TECHNICAL DATA, page 31).

3 Commissioning

3.1 Scope of delivery

OxiTop® measuring heads are included in several scopes of delivery that contain also other accessories or a varying number of measuring heads.

Here, only those scopes of delivery are listed that include only measuring heads (without any other accessories):

- Measuring head / measuring heads (number of heads in set compositions)
  - OxiTop®-IDS (/2/6) (number: 1, 2 or 6)
  - OxiTop®-IDS/B
  - OxiTop®-i G
  - OxiTop®-i B
  - OxiTop®-i 6 (number: 3 x OxiTop®-i G and 3 x OxiTop®-i B)
  - OxiTop®-i 12 (number: 6 x OxiTop®-i G and 6 x OxiTop®-i B)
- Operating manual

3.2 Power supply (OxiTop® measuring heads)

All OxiTop® measuring heads are supplied with power by batteries (see section 7 TECHNICAL DATA).

3.3 Initial commissioning

No extra steps are required for the initial commissioning of an OxiTop® measuring head.

Each measuring head can be assigned an individual ID (see section 4.6.2 SYSTEM SETTINGS), so the measurement values can be correctly assigned to the measuring heads and sample bottles.

4 Operation

The OxiTop®-i measuring heads are exclusively operated with the keys on the measuring heads.

The OxiTop®-IDS measuring heads are optionally operated via a wirelessly connected control meter (Multi 3630/3620 IDS) or via the keys on the measuring heads.

4.1 General operating principles

figure 4-1 Control panel example: OxiTop®-IDS

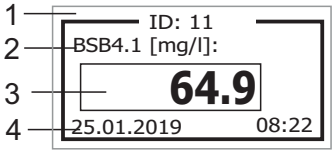
1 LED to indicate operating conditions
2 IDS measuring head (suitable for wireless communication)
3 Display
4 Key **<M>**
5 Key **<ENTER>**
6 Navigation key **<▲▼>**

Keys In this operating manual, keys are indicated by brackets <..> .
The key symbol (e.g. **<MENU/ENTER>**) generally indicates a short keystroke (under 2 sec) in this operating manual. A long keystroke (approx. 2 sec) is indicated by the underscore behind the key symbol (e.g. **<MENU/ENTER_>**).

To switch a measuring head on, press any key.

<M>	● In the start display (*ID...*): Display the measurement settings (Info display *BOD parameters*) ● In the info display *BOD parameters*: Start the measurement ● In menus/submenus/settings: Take over the selection / entry, Exit the menu/submenu and go one level higher
<M_>	Switch off the measuring head (if a measurement is running, there is a security prompt for confirmation)
<ENTER>	● In the start display (*ID...*) / info display (*BOD parameters*): Opens the menu for measurement settings ● In menus: Confirm selection / entry
<ENTER_>	In the start display (*ID...*) / info display (*BOD parameters*): Opens the menu for system settings
<▲▼>	● In menus: Navigation in the menu ● In the selection: change numerical values
<▲▼_>	Only for OxiTop®-IDS Establish wireless connection to the meter

4.1.1 Display



1 ID of the measuring head
2 Info on displayed measured value
3 Measured value
4 Date and time

4.1.2 Status information

Status information in the display

Batteries almost empty.
Before starting a measurement, exchange the batteries (see section 5.1.1 EXCHANGING THE BATTERY).
For suitable measures, see section 6 WHAT TO DO IF...

Status LED The status LED indicates the current state of a measurement.
The LED flashes slowly (approx. every 5 secionds).

Color	Explanation
Magenta (Only OxiTop®-IDS)	Measurement is running. The measuring head can be reached via radio.
Blue	Measurement is running. The OxiTop®-IDS measuring head cannot be reached via radio.
Red	Measurement is running. The measuring head is in a critical condition: ● The battery is nearly discharged or ● The pressure in the sample bottles is too high. For suitable measures, see section 6 WHAT TO DO IF...
Green	The measurement is finished. The status LED flashes green for approx. 24 hours. The OxiTop®-IDS measuring head can be reached via radio.

4.2 Navigation

The principles of navigation in menus and dialogs are explained in the following sections.

4.2.1 Operating modes

The instrument has the following operating modes:

Operating mode	Explanation
Measuring	The measurement data of the connected sensor are shown in the measured value display
Setting	The display indicates a menu, submenu, settings or functions

Only those displays and functions are available in the active operating mode that are currently being required.

4.2.2 Menus and dialogs

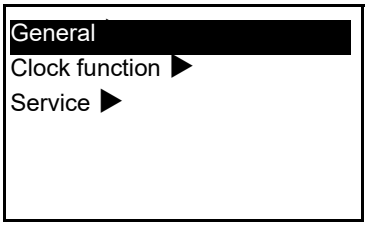
The menus for settings and dialogs in procedures contain further subelements.

- Select a submenu or change a numerical value with the **<▲▼>** key.

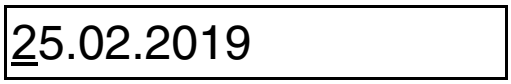
- Using **<ENTER>**, activate (✓) or deactivate a function, or confirm a numerical value and switch to the next digit.
- Press **<M>**
  - to take over a selection / entry,
  - to quit a menu/submenu/setting or
  - to go to the superordinate level.

4.2.3 Elements in menus and dialogs

- Submenus
  Menu items that open a submenu are indicated by an arrow pointing to the right side (▶).
  Submenus are opened by confirming with **<ENTER>**. Example:



- Numerals settings (e.g. date/time)
  The first digit is indicated by an underscore.

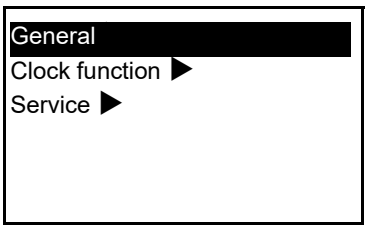


  - using **<▲▼>**, change the digit with the underscore
  - using **<ENTER>**, confirm the digit and go to the next digit.
  - using **<M>**, confirm the entire number (e.g. date or time and exti the setting.

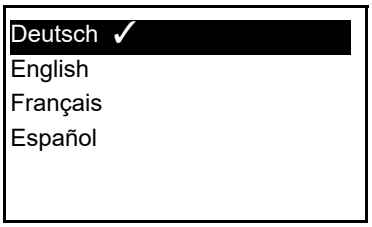
- Functions (activate/deactivate)
  Active functions are indicated by a checkmark ✓ next to the function name. They are activated/deactivated by being confirmed with **<ENTER>**.
  Example: function *Illumination* ✓, language Deutsch ✓.

4.2.4 Example on navigation: Setting the language

1. Switch on the measuring head with **<M>**.
   The current ID of the measuring head is displayed.
2. Open the system menu with **<ENTER_>**.
3. Using **<▲▼>**, highlight the *General* menu.



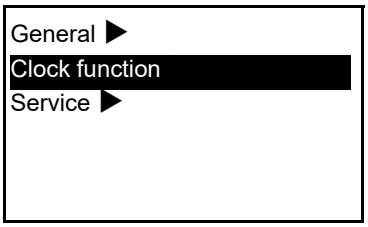
4. Using **<ENTER>**, open the *General* menu.
5. Using **<▲▼>**, highlight the *Language* setting.
6. Using **<ENTER>**, open the *Language* menu.



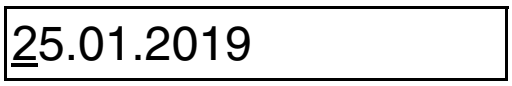
7. Select the required language with **<▲▼>**.
8. Confirm the setting with **<ENTER>**.
   The menu is closed.
   The measuring head is restarted.
   The selected language is active.

4.2.5 Example on navigation: Setting the date

1. Switch on the measuring head with **<M>**.
   The instrument ID is displayed.
2. Open the system menu with **<ENTER_>**.
3. Using **<▲▼>**, highlight the *Clock function* menu.



4. Using **<ENTER>**, open the *Clock function* menu.
5. Using **<▲▼>**, highlight the *Date...* setting.
6. Using **<ENTER>**, open the *Date...* menu.



7. Using **<▲▼>**, select the number for the highlighted digit.
8. Using **<ENTER>**, confirm the number for the selected digit and go to the next digit.
9. Repeat the two last steps for all digits.
10. Exit the setting with **<M>**.

4.3 BOD determination

Municipal wastewater does not normally contain any toxic or inhibiting substances. There are enough nutrient salts and suitable microorganisms present. Under these conditions, BOD determination in the undiluted sample using the OxiTop®(-i/-IDS) measuring system is possible.

Instruments and accessories required

- OxiTop®(-i/-IDS) measuring head
- Stirring platform (inductive stirring system)
- Thermostat cabinet or box (temperature 20 °C ± 1 °C)
- Brown sample bottles (bottle volume 510 ml)
- Magnetic stirring rods
- Magnetic stirring rod remover
- Suitable overflow volumetric flask
- Rubber sleeves
- Nitrification inhibitor (NTH 600)
- Sodium hydroxide tablets (NHP 600)

Further documents for BOD determination

- WTW application reports (see www.wtw.com)
- DIN EN 1899-2 Water quality - Determination of the biochemical oxygen demand after n days (BOD_n) - part 2: Procedure for undiluted samples (ISO 5815:1989, modified)

4.4 Measuring (example: BOD determination)

4.4.1 Preparing the measurement

Determining the sample volume

1. Estimate the expected BOD value for the waster water sample.

The expected BOD value is approximately 50% of the COD value.

2. Look for the relevant measuring range in the following table and take the values for sample volume and multiplier.

Sample volume (ml)	Measuring range (mg/l)	Multiplier *
432	0 - 40	1
365	0 - 80	2
250	0 - 200	5
164	0 - 400	10
97	0 - 800	20
43.5	0 - 2000	50
22.7	0 - 4000	100

* for the conversion of digits (only with the setting: *Unit...*[digit])

Too big a measuring range will lead to inaccurate results.
A measuring range selected too small will cause the results to be not evaluable.

Preparing the stirring platform

1. Install a stirring platform for the sample bottles in a temperature-controlled environment (e.g. in a thermostat cabinet or thermobox, see operating manual of the thermostat cabinet or thermobox).

Preparing the sample bottles

2. Rinse the sample bottles with the water sample and let the water drip off well.

Preparing the measuring head

3. Check and specify the measurement settings at the measuring heads.

Preparing the samples

4. Follow the specification (and application reports) and exactly measure the oxygen-saturated (well homogenized) sample volume required.

To measure the sample volume, overflow measuring flasks or measuring cylinders are normally used.

5. Place the magnetic stirring rod in the sample bottle.
6. Fill the measured sample volume into the sample bottle.
7. Add nitrification inhibitor NTH 600 (see table).

BOD measuring range [mg/l]	Sample volume [ml] (overflow measuring flask)	Quantity of NTH 600 [drops per sample bottle]
0 - 40	432	9
0 - 80	365	7
0 - 200	250	5
0 - 400	164	3
0 - 800	97	2
0 - 2000	43.5	1
0 - 4000	22.7	1

To guarantee an optimum and safe stirring function:
Use only original accessories (RST 600 stirring rod).

8. Insert a rubber sleeve into the bottle neck.
9. Place 2 sodium hydroxide tablets in the rubber sleeve using tweezers.

The sodium hydroxide tablets must not get into the sample!

10. Screw the OxiTop® measuring head directly on the sample bottle (close tightly).
11. Place all sample bottles in the center of the stirring places on the stirring platform.
12. Observe the stirring operation, correct the bottle positions if necessary. (see operating manual of the stirring platform)
13. For OxiTop®-IDS (function *Wireless* active):
Connect the measuring heads with the meter (see operating manual "Multi 3630/3620 IDS operation with OxiTop®-IDS".

4.4.2 Starting the measurement

1. Display the info display (BOD parameters) with **<M>**.

Check the settings. If necessary, change the measurement settings with **<ENTER>**.

2. Start the measurement with **<M>**.
   If the signal LED is active, it will flash blue.
   The display shows *AutoTemp*.

3. Keep the sample bottle (with the OxiTop®(-i/-IDS) measuring head screwed on) in a place that is controlled to 20°C (e.g. thermostat cabinet/box) for the specified number of days.
   When the measuring temperature has been reached (function *AutoTemp*: after at least 1 hour, at most approx. 3 hours), the OxiTop®(-i/-IDS) measuring head automatically starts measuring the oxygen consumption.

4. Stir the sample continuously during the specified measuring duration (stirring platform).
   During the specified measuring duration, the OxiTop®(-i/-IDS) measuring head automatically saves a measured value once every 24 hours.

5. Read out the saved measured values after the specified measuring duration has expired.
   If the signal LED is active, it will flash green.

4.4.3 Displaying measurement data

You can view the measurement data during a measurement (LED flashes blue) and after a measurement (LED flashes green).

1. When the display is switched off:
   Switch on the display with any key.
   The current value (during measurement) or the value last determined (after the end of the measurement) is displayed.

2. Using **<▲▼>** , scroll through the values stored last.
   The measured value can be assigned to the day via the index (BOD0,1,2 ...7).

3. You can display the measured values as a graphic with **<▲▼_>**.

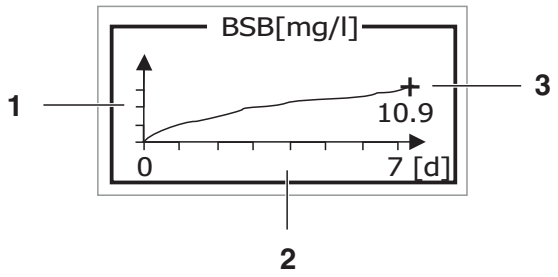


figure 4-2 Graphic display of a BOD measurement

1 Y-axis: Measured value
2 X-axis: Days
3 Cursor

4. Using **<▲▼>** , indicate the measured value of the individual days with the cursor.
5. Using **<▲▼_>** , quit the graphic display.
   The stored data are displayed again.
6. Terminate the display of the stored measured values with **<M>**.

4.5 Calibration

Why calibrate? The condition of the heads can be evaluated by checking the tightness and measuring accuracy (see BOD application report).

When to calibrate? Routinely within the framework of the company quality assurance.

Calibration procedure Creation of a defined negative pressure and balancing with the display (see BOD application report).

In contrast to physical or chemical measuring methods, BOD systems do not provide standardized values, as the use of microorganisms has a great spectrum depending on their composition and food supply. With the aid of testing tools and suitable tests, errors due to defective pressure sensors or untight measuring head threads can be identified.

You can check the OxiTop®(-i/-IDS) measuring heads with the following procedures.

- OxiTop®-PM (Cal-Test)
- OxiTop®-PT (pneumatic test)

4.5.1 OxiTop®-PM (Cal-Test)

The test checks the tightness and calibration of the pressure measuring system with the aid of a chemically simulated BOD.

The OxiTop®-PM calibration tablet contains, among other, a defined amount of sodium sulfite. The oxygen in the sample bottle oxidizes the sodium sulfite to sodium sulfate. This process consumes the oxygen present in the sample bottle. The reduction of oxygen causes a defined negative pressure. The BOD value corresponding to this negative pressure is given in the packet.

The procedure is similar to a BOD5 measurement with

- specified filling volume (164 ml) and
- addition of the calibration tablet

Details on sample preparation and steps of the test: see operating manual of the OxiTop®-PM test resource.

Start of the test

The test is started in one of the following ways:

- OxiTop-i®, OxiTop®-IDS without wirelessly connected meter:
  BOD5 measurement (with fixed filling volume)
- OxiTop®-IDS with wirelessly connected meter:
  Menu-guided test OxiTop®-PM
  (see operating manual of the meter)

Evaluation at the measuring head

1. Display the measurement result at the measuring head.
2. Compare the measured value to the lot test value (see operating manual OxiTop®-PM).

With the OxiTop®-IDS measuring heads, the calibration date for the measuring heads is stored in the wirelessly connected meter.

Evaluation in the meter

see operating manual "MultiLine OxiTop®-IDS".

4.5.2 OxiTop®-PT (pneumatic test)

The test checks the measurement accuracy of the integrated pressure sensor with the aid of a testing device creating a defined negative pressure. Correctly functioning OxiTop® measuring heads indicate the negative pressure created. The altitude above sea level is taken into account for evaluation.

To perform the pneumatic test, you require the test resource OxiTop®-PT.

The test says nothing about the long-term impermeability of the system.

Start of the test

1. Open the menu **<ENTER_>**/*Service*/*OxiTop PT...*.

2. Follow the instructions on the display.
3. Set the plunger of the syringe on the OxiTop® PT test resource to 0.5 ml.

While this is being done the measuring head must not yet be screwed on the test resource OxiTop®-PT.

4. Confirm the current air pressure at the measuring head to be tested with **<ENTER>**.
5. Tightly screw the measuring head onto the OxiTop® PT test resource.
6. Set the plunger of the syringe on the OxiTop®-PT test resource to 2.0 scale parts.
   This creates a negative pressure.
7. Confirm the displayed negative pressure at the measuring head with **<ENTER>**.
   The difference pressure is displayed as the result.

4.6 Settings

4.6.1 Measurement settings

Menu		Explanation
Duration...	1 ...5 ..7	Set the measuring duration in days For OxiTop®-IDS, a longer measuring duration can be set at the wirelessly connected meter.
Unit...	mg/l ΔhPa hPa digit	Select a unit.
Sample volume...	22.7 43.5 97.0 164.0 250.0 365.0 432.0	Select the sample volume.

4.6.2 System settings

Menu			Explanation
General	*Language* *Deutsch* *English* *Français* *Español*	 (✓) (✓) (✓) (✓)	Select the menu language The active language is marked with a checkmark (✓).
	Illumination	(✓)	Switches the display illumination on/off When the display illumination (*Illumination* ✓) is enabled, any keystroke starts the illumination for 10 seconds. If no key is pressed within 5 seconds the display illumination switches itself off.
	Signal LED	(✓)	Switch on/off the indication of the operating conditions by a 3-colored LED. The LED can be switched off to save energy.
	Switch-off time...	0 ... 9 min	● Active measurement: The display is switched off after the specified interval has expired. ● No active measurement: The instrument is switched off after the specified interval has expired. Set the switch-off time as short as possible to save energy.
	ID...	0 ... 999	Select an individual ID for each measuring head. Thus you will later be able to definitely assign the measurement data.
Clock function	*Date...* *Time...*		Set the date and time. The measurement data are documented with the date and time.
Service	*Service info...*		Overview of software- and hardware versions
	OxiTop PT...		Pneumatic test (OxiTop®-PT) with the aid of the OxiTop®-PT testing tool
	Update mode... (only for OxiTop®-IDS measuring heads)		Firmware update of the measuring head via the meter
	Wireless (only for OxiTop®-IDS measuring heads)	(✓)	The *Wireless* function has to be active so that the connection to the meter can be established. The radio connection can be switched off to save energy.
	Intern *Bottle volume...*		 Set the bottle volume

5 Maintenance, cleaning

5.1 Maintenance

The only maintenance activity required is replacing the battery.

5.1.1 Exchanging the battery

You can exchange the battery while measuring without losing any data. For the battery exchange, remove the bottle from the climatized zone for a short time and place it on a solid surface. Heed the normal precautionary measures when dealing with glass containers.

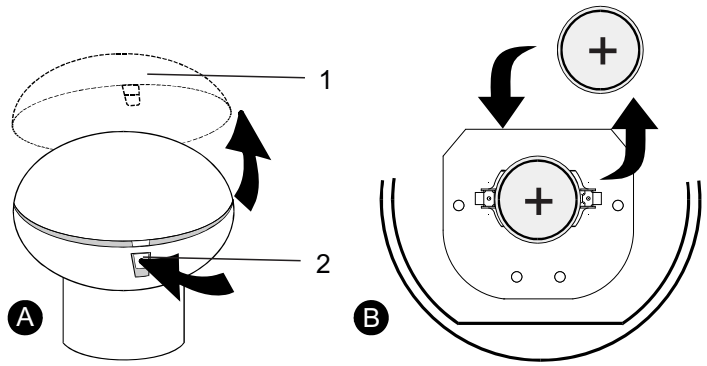


figure 5-1 Battery exchangeOxiTop-i®

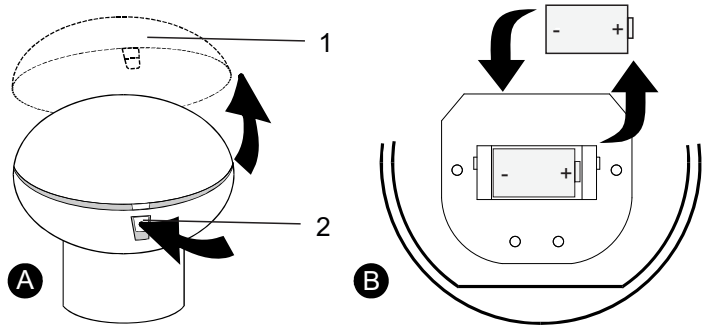


figure 5-2 Battery exchangeOxiTop®-IDS

1 Upper case
2 Snap-action holder

1. Press in the snap-action holder (2).
2. Open the upper case (1).
3. Remove the battery.
4. Insert a new battery. Make sure to insert with the correct polarity.

5. Insert the upper case (1) with the lug in the locking pin (lower case). Do not crush the cable connection!

6. Close the upper case (1) (snap-action holder catches).

7. Switch on the measuring head.
The input field for the date is displayed.

8. Re-set the date and time.
OxiTop®-IDS measuring heads: You can send from the meter to the measuring head the current date and time (see operating manual of your meter).

5.2 Cleaning

5.2.1 Measuring head

Occasionally wipe the outside of the measuring heads with a damp, lint-free cloth.

NOTE
The housing is made of synthetic material (ABS, PMMA). Thus, avoid contact with acetone or similar detergents that contain solvents. Remove any splashes immediately.

NOTE
Never use joint grease or other lubricants for your OxiTop®(-i/-IDS) measuring heads. Some of these products contain solvents that can cause damage to the plastic enclosure.

The sealing of the BOD bottles is also perfectly adequate without grease. However, always wipe off heavy contamination and particles on the sealing surfaces of the rubber sleeves and OxiTop®(-i/-IDS) measuring heads.

Any damage caused by using joint grease is excluded from warranty.

5.2.2 Sample bottles

Rinse the bottles with clear water or water from the next sample.

Remove gross contamination mechanically, e.g. using a brush.

After using detergents, rinse thoroughly!
Any remains of detergents can interfere with the BOD determination!

Do not use any disinfectants.
Disinfectants kill the required microorganism!

5.3 Packing

The OxiTop®(-i/-IDS) measuring head is shipped in a protective transport packing.
We recommend: Keep the packing material. The original packing protects the OxiTop®(-i/-IDS) measuring head from damage due to transport.

6 What to do if...

Displayed measured value too low

Cause	Remedy
– The measuring equipment is untight	– Tighten the measurement equipment
– Insufficient sample preparation, lacking sample conservation.	– Carry out suitable sample preparation, sample conservation
– The temperature of the sample had not sufficiently adapted (< 15°C).	– If possible, repeat the measurment.
– Too few NaOH tablets	– Use the recommended amount of fresh NaOH tablets

Displayed measured value too high

Cause	Remedy
– The measuring range selected is too small.	– With very high values (> 2000 mg/l): Dilute the sample and start a new measurement.
– Missing or lacking nitrification inhibitor (ATH)	– Use enough nitrification inhibitor (ATH)

Signal LED flashes red

Cause	Remedy
– Allowed pressure exceeded (OFL is displayed, only with anaerobic degradation tests)	– Vent the sample bottle
– Battery nearly discharged (the symbol for low battery is displayed)	The following measures are taken automatically during a measurement to avoid data loss: – Radio connection to the meter (only for OxiTop®-IDS): Off – Signal LED (green, blue): OFF The LED flashes red only. – Display illumination: Off – *Switch-off time*: 1 min The measurement can still be continued for 7 days after the low battery display appears.
	You can change the battery without data loss while the measurement is running (see section 5.1.1).

Measuring head does not react to keystroke

Cause	Remedy
– Operating condition undefined	– Press the **<M>** and **<▲▼>** keys simultaneously (reset)

Error: new date! **in the input field for the date**

Cause	Remedy
A measuring head has currently no valid reading of date and time (e.g. after the battery was exchanged). – There is no date stored in the measuring head (e.g. after the battery was exchanged) – A wrong current date was entered during a measurement (e.g. after the battery was exchanged). Possible causes: – Wrong manual entry or – Transmission of a wrong date from the meter	– Enter the current date at the measuring head or – For wireless operation of the measuring head with a meter: – Check whether the correct date is set in the meter – If necessary, set the current date and time in the meter (see operating manual of your meter) – Transmit the date from the meter to the measuring head (see operating manual OxiTop®-IDS (/B) Multi 3630/3620 IDS, setting of date and time at the OxiTop®-IDS measuring head)
– A correct current date is entered during a measurement (e.g. after the battery was exchanged). The stored start date of the measurement was erroneous.	– Measurement data that have an erroneous date while the measurement was started cannot be evaluated. Using **<M_>**, cancel the measurement and erase all data

7 Technical data

Dimensions	Approx. H 69 x ∅ 70 mm	
Weight	Approx. 85 g	
Mechanical structure	Type of protection	IP 54
Electrical safety	Protective class	III
Test certificates	CE	

Measuring principle	Manometric	
Measuring ranges	ΔhPa, hPa	500 ... 1250 (OxiTop®-IDS) 500 ... 1500 (OxiTop®-IDS/B) 500 ... 1250 (OxiTop-i®)
	mg/l	0 ... 4000
	digit	0 ...50
Resolution	mg/l ΔhPa, hPa digits (scale parts)	± 0.1 (max.) ± 1 ± 1
Accuracy	ΔhPa, hPa	± 0.5% of the measured value ± 1 hPa
Allowed measuring temperature	20 °C ± 1 °C	
Allowed sample temperature (when being filled)	15 - 21 °C	

Ambient conditions	Storage	- 20 °C ... + 70 °C
	Operation	0 °C ... + 55 °C
	Admissible relative humidity	Yearly mean: < 75 % 30 days/year: 95 % Other days: 85 %

Power supply OxiTop-i®	Lithium battery	Type CR 2450 / button cell battery (600 mAh, 3V)
	Operational life OxiTop-i®	Fully loaded battery: ● Measuring head OFF: Approx. 3.5 years ● Measurement active (display and illumination 1 min/day ON):

LED	Operational life
Off	~ 3 years
ON (✓)	~ 1.4 years

Power supply OxiTop®-IDS	Lithium battery	Type LS14250 / 1/2 AA (1200 mAh, 3.6 V)
	Operational life OxiTop®-IDS	Fully loaded battery: ● Measuring head OFF: Approx. 7 years ● Measurement active; (data transmission: 1/day):

LED	Readiness for radio communication (Eco mode)	Operational life
ON (✓)	1 h/day	~ 2 years
ON (✓)	5 h/day	~ 1 year
ON (✓)	24 h/day (Eco: OFF)	~ 100 days

Energy saving functions: see operating manual of your meter

Radio technology	Bluetooth LE	Bluetooth 4.0 Class 3 (0 dBm) Contains transmitter modules FCC ID: QOQBLE113 IC: 5123A-B6TBLE113

At the moment, there exist licenses of the BlueTooth LE radio module in use for Europe, USA, Canada, and other countries (list available from WTW on request.)

Most important licenses: CE, FCC. All countries following these directives can use this product without hesitation. Otherwise, further local licenses may be necessary. On request, WTW can make available excerpts from the datasheet of the supplier of the BlueTooth LE radio module.

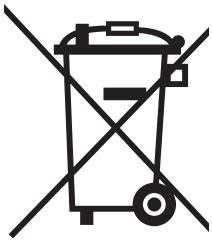
Guidelines and norms used	EMC	EU directive 2014/30/EU EN 61000-6-3 EN 61000-3-2 EN 61000-3-3 EN 61000-6-1 FCC Class A
	Radio data transmission	EU directive 2014/53/EU (RED) EN 300 328 EN 301489-1 EN 301489-17
	Instrument safety	EU directive 2014/35/EU EN 60950
	IP protection class	EN 60529

8 Disposal

All components of the OxiTop® contain electronics.

Handle and dispose of all waste in compliance with local laws and regulations.

EU only: Correct disposal of this product — WEEE Directive on waste electrical and electronic equipment

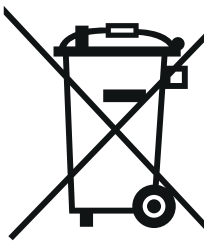


This marking on the product, accessories or literature indicates that the product should not be disposed of with other waste at the end of its working life.

To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Waste from electrical and electronic equipment can be returned to the producer or distributor.

EU only: Correct disposal of batteries in this product



This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other waste at the end of its working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in Directive 2006/66/EC. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material re-use, please separate batteries from other types of waste and recycle them through your local, free battery return system.

Xylem |ˈzīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com.

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