



Operating Instructions for OXYBABY[®] 6 for O₂/CO₂





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WITT-TECHNOLOGY FOR GASES

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2 Introduction

The OXYBABY® is an ergonomic, cordless, one-hand oxygen and carbon dioxide analyser, used for the preventive inspection of the shelf life of a food packed in modified atmosphere packaging (MAP). It has a measuring range of 0 per cent by volume to 100 % per cent by volume O₂ or CO₂ in non-combustible and non-aggressive gases, and can be used for determining the carbon dioxide content as well as the residual oxygen content in food packaging.



Caution!

The device is not designed to be used in potentially explosive areas and may not be used for measurements which involve burnable gases.

The OXYBABY® comes with an internal data memory for readings (ring buffer, for maximum number of data records refer to the Chapter on Technical data 14), which are retained in the memory even when the device is switched off.

If the rechargeable battery is spent,

- the stored data is retained (e.g. product, user, manufacturing date),
- the data and time are retained for approx. one week (buffer capacitor).

The measured values can be copied to your PC using the optionally-available software for the WITT Logger.

The OXYBABY® is equipped with a needle cover to protect the user.

Because of the variations in equipment your Oxybaby® may differ somewhat from these instructions.

2.1 Which symbols have been used?



The Caution! symbol indicates a possible hazard for people or the analyser device. These instructions must be noted and observed.



Note !

A pointing hand is used to denote general information, which explains operating procedures.

- A "dot" denotes operating instructions.
- This symbol indicates a list



This symbol prompts readers to turn over the page.

3 Scope of delivery

The Oxybaby[®] is delivered as a complete unit.

Also included in the scope of delivery along with the analyser device:

Quantity	Designation	WITT art. no.
1	Case	800.507400
1	Plug-in power supply unit / charger	800.736200
1	USB cable	850.012400
100	Foam pads as plate	800.507900
2	Injection needles in protective container	800.499700 800.286100
2	Needle filter with 0.45 µm filter unit	800.462800
1	Operating instructions for the Oxybaby [®] 6 terminal software* on CD-ROM and WITT Logger data logging software* on CD-ROM (DEMO version, with optional enabling) incl. USB drivers (* The WITT Logger and the Oxybaby [®] terminal program are not designed for use with the "Russian" and "Japanese" language versions.)	595.000001

4 Operating principle

The device uses the integrated pump to suck-in a gas sample from the packaging to be inspected and routes it to an O₂ and a CO₂ measuring cell.

The O₂ content in the aspirated gas mixture generates, in the chemical measuring cell, a weak electrical voltage proportionate to the O₂ content. This voltage is measured and converted to form a concentration value, which is then shown on the display.

The CO₂ measuring cell operates according to the infrared absorption principle.

Once the analysis is over, the O₂ and CO₂ concentration levels are stored with the date and time. The internal memory is designed as a ring buffer (maximum number of stored measuring data: see Technical data).

Everytime the memory is full, and a new measured value is stored, the oldest measured value is overwritten. The assigned memory location is displayed by a segment bar at the top of the display.



The O₂ measuring cell of the Oxybaby[®] has a service life of approx. 1.5 to 2 years with an O₂ content of 21 % per cent by volume. If the O₂ content is higher than 21 % per cent by volume, the service life for the O₂ measuring cell is reduced (See Technical data for details).

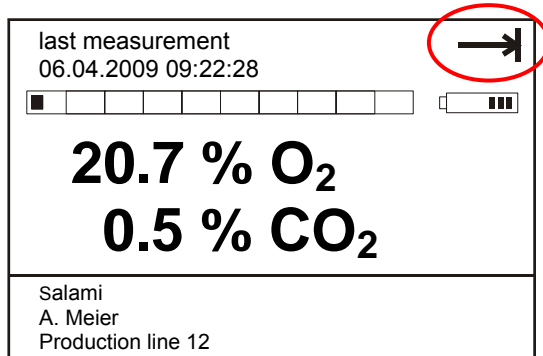
The CO₂ measuring cell is non-wearing.

Oxybaby[®] is equipped with automatic pressure compensation, which serves to prevent any falsified test results through changing ambient pressures or gas pressures in the packaging.

5 Sample Hold and Permanent operating modes

The Oxybaby® is designed for two different operating modes. The symbol at the right in the upper line on the screen indicates the operating mode:

- the  symbol denotes the "sample Hold" operating mode,
- the  symbol denotes the "permanent" operating mode



"Sample Hold" operating mode (sample measurement)

After the start of the measurement (see Chapter 7) the measuring program then runs automatically. A gas sample is taken from the packaging and the O₂/CO₂ concentration level measured. Once the measuring time process has ended (see Techn. data) the gas sample is automatically stopped.

The measured O₂/CO₂ concentration level is automatically stored once the measurement is over along with date and time (incl. product designation, inspector and production line).

"Permanent" operating mode

Once the measurement has started, (see Chapter 7) gas is continuously sampled and the O₂/CO₂ concentration level is measured.

The measurement can be stopped at any given time with .


The last determined measured value is automatically stored along with date and time (incl. product designation, inspector and production line).

6 Power supply

The power supply is provided by means of a rechargeable battery pack with three integrated, rechargeable batteries (Type: see Technical data). The service life of the rechargeable battery pack is dependent on the ambient conditions and the number of charge cycles.

If required, the rechargeable battery pack can be replaced. Only genuine WITT spare parts should be used here, a new rechargeable battery pack can be ordered from WITT-Gasetechnik .

The charge status of the rechargeable batteries is denoted by a battery symbol in the top right corner of the display, a dark battery indicates: fully charged. The Oxybaby[®] switches off when the rechargeable battery is spent.

 ***If the rechargeable battery charge is no longer sufficient to perform a reliable measurement, a warning message is shown on the display. In such an instance do not perform any more analyses, as the measurement accuracy may be impaired.***

 ***You can easily switch between rechargeable battery mode and power supply unit mode when operating it.***


6.1 Charging rechargeable batteries

We advise you to charge the rechargeable batteries for the Oxybaby[®] at the very latest when "battery low" is shown on the display.

Connect the Oxybaby[®] to the power supply unit / charge as follows and charge the batteries:

- fold down lug on right side.
- insert combined USB charging cable / power supply unit cable into USB connection on the Oxybaby[®].
- insert the plug of USB charging cable / power supply unit cable into socket on power supply (see Technical data) and charge the rechargeable batteries.
The battery symbol at the top right of the display flashes on and off as long as the rechargeable batteries are being charged.

 ***Do not perform any measurements during the charging process, as the measuring accuracy may be slightly impaired.***

 ***To ensure that the calibration accuracy is not impaired: do not calibrate the device until 1 hour after the rechargeable batteries have been charged.***



6.2 Power supply unit operation



Use the USB power supply unit / charger as supplied only! Otherwise the OXYBABY[®] may not function correctly. WITT-Gasetechnik will not be held liable for any damage caused by external power supply units or chargers.

 ***The USB connection is disabled when the power supply unit / charger is being used.***

- Fold down lug on right side.
- Insert combined USB charging cable / power supply unit cable into USB connection on the OXYBABY[®].
- Insert the plug of USB charging cable / power supply unit cable into socket on power supply (see Technical data).

OXYBABY[®] switches on and is now ready to perform measurements

 ***You can change into the rechargeable battery mode at any given time.***


7 Operation



Note!

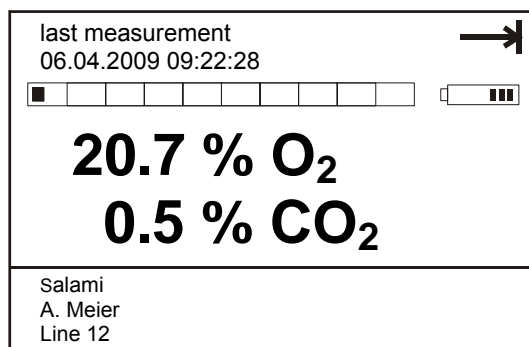
Before operating for the first time, charge the rechargeable batteries for 2 hours. (see Chapter 6)



7.1 Switching on

- Switch on device using .

When starting up the LCD display briefly shows the software version and the serial number of your device. The "version" menu item enables you to display the data during operation (see Chapter 8.10.6).

Finally, the OXYBABY® is in the **Measuring and display mode** and shows the **last measured value**:

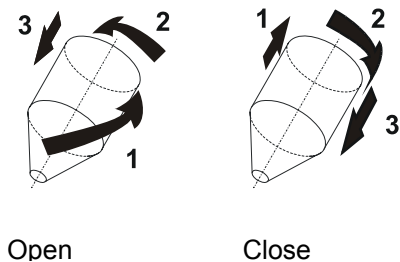


- The upper line of the display shows the date, time and operating mode of the last measurement for your OXYBABY®. The  symbol indicates the "sample Hold" operating mode, the  symbol denotes the "permanent" operating mode.
- The memory space available at any given time is indicated by the bars below: **assigned memory capacity** is displayed by darkened bar segments, **free memory space** by empty bar segments.
- The battery symbol at the right indicates the charge status for your OXYBABY®. A darkened battery signifies: fully charged.
- The last measured O₂ / CO₂ concentration level is shown by the OXYBABY® in the centre of the display as per cent by volume.
- Below the measured value the OXYBABY® shows the product designation, the name of the user and the line (production line) for the last measurement.

Example:	Product designation:	Salami
	User:	A. Meier
	Line:	Line 12



7.2 Opening /closing needle cover



Recommendation!
 Open the needle cover immediately before a measurement and then close it again immediately after each measurement.

7.3 Conducting measurements

Caution!
 Adapt the OXYBABY® before the measurement to any changes in climate, to avoid any falsified test results (see Technical data).
 This also applies to packaging which is stored at higher or lower temperatures than the OXYBABY®.

We advise calibrating the OXYBABY® before the first measurement (see Chapter 8.9 and 9).

You can increase measuring accuracy by

- performing two measurements at a very low temperature or by extending the measuring time.
- performing two measurements or extending the measuring time on successive measurements on packages with very different gas concentration levels.

7.3.1 Sample Hold measurement →

- Change to the “sample hold” operating mode if required (see Chapter 8.4).
- Select any product, user or line (production line) (see Chapter 8)
- Stick foam pads onto the packaging that you wish to measure. This seals the pierced position.
- Open the needle cover (see 7.2)
- Pierce the packaging through the foam pad.

Caution!
 Do not jab into the fluid or the packaged product. Otherwise the OXYBABY will be soiled, the needle or hose may clog up or the sensor may be damaged.

- Start measurement with .
- The remaining measuring time is shown by the OXYBABY® at the top right of the display. You can extend the measuring time during the measurement.
 - Press key again, the measurement continues, if you press the key again briefly.
- Close the needle cover (see 7.2)

The last current measurement is shown on the display.

The measurement ends automatically in the Sample Hold mode →.
 At very low temperatures, you may also need to run two measurements to increase the measurement accuracy.



7.3.2 Measurement in Permanent mode

- Change the operating mode to “permanent” if required (see Chapter 8.4).
- Select any product, user or line (production line) (see Chapter 8)
- Stick foam pads onto the packaging that you wish to measure.
This seals the pierced position.
- Open the needle cover (see 7.2)
- Pierce the packaging through the foam pad.



Caution!

Do not jab into the fluid or the packaged product. Otherwise the OXYBABY will be soiled, the needle or hose may clog up or the sensor may be damaged.

- Start measurement with .
- End measurement with .
- Close the needle cover (see 7.2)

The last current measurement is shown on the display.




During the permanent measurement, the current measured value is automatically stored every 10 seconds along with the date and time.

7.4 Switching off

When in **rechargeable battery mode**:

(i.e. operation without USB power supply unit and without USB cable at the USB interface)

- Press  key for approx. 2 seconds and hold.
- The device is now automatically purged with air and it then switches off.




The OXYBABY® is also equipped with an automatic switch-off function. It switches off automatically if no commands are received for approx. 2 minutes (e.g. key actuations or measurements).

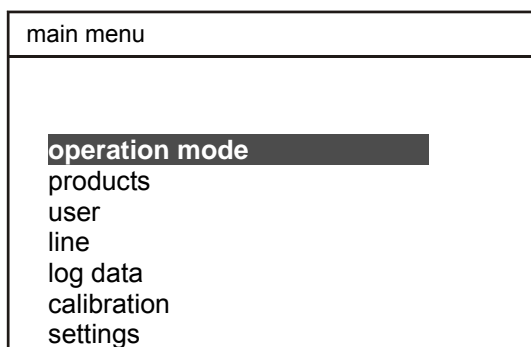
If the power supply is connected through the **USB interface** (through plugged-in USB power supply unit or a USB cable).



- Disconnect USB power supply unit or USB cable.
- Continue as described above in rechargeable battery mode.

8 Setting and managing the Oxybaby (program options)

8.1 Showing main menu, selecting or exiting menus





Pressing the  or  key takes you to the main menu.





 **Note!**
If you press the  key, you exit the main menu and return to the Measuring and display mode, without changing the settings for your OXYBABY®.

The name of the currently-selected menu (main menu here) is shown on the top line.

The OXYBABY® is available with a series of program options, which you can select using the arrow keys. The currently pre-selected program option appears in white lettering against a dark background:

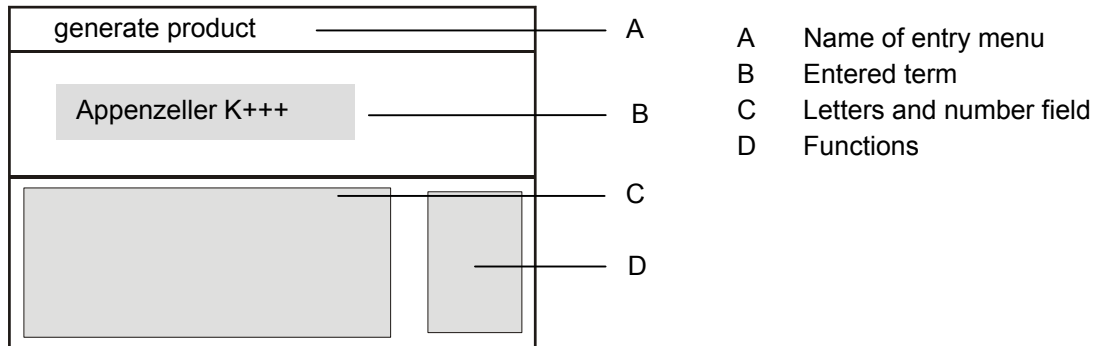
- press arrow key  or  until the desired program option is highlighted in black.
You may need to press the arrow key  several times to access submenus that are not shown on the display. The display of the submenus changes accordingly.
- press the  key. The corresponding submenu opens.


 **Note !**
If you press the  key, you exit the submenu and return to the main menu or the measuring and display mode, without changing the settings for your OXYBABY®.

8.2 Entering or changing data using the buttons on the OXYBABY®





8.2.1 Entering data (Product names, users, production lines)

To enter new data the OXYBABY® comes with an entry menu, e.g. the "generate product" menu.



The four arrow keys and the  key can be used to enter text, e.g. new products, users or production lines.

Entering characters:

- **letters or numbers** can be selected using the arrow keys     in the letter and number field, a shaded border indicates the selected character.

Letters and number field:






1	2	3	4	5	6	7	8	9	0
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z	-	,	.	



You can also enter spaces, full stops, commas and hyphens (bottom right).

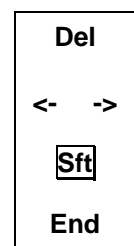
- Press  key, once the desired character has a border round it.

The character appears above the number field in the "Entered term" area (B).

To the right of the letters and number field you will find the following **functions**:

- "Delete" ,
- in the entered term, shift the cursor "_" to the left  and right ,
- switch between **upper and lower case** using the  key and
- end with simultaneous save of the entry with  :








Using the arrow keys     shift the cursor until the desired function is highlighted by the shared border (shown here by the Shift key 



In the entered term (B), the cursor is marked by a darkened underline "_", a position that has not yet been assigned by a + symbol:








Example: Appenzeller K+++

You can **shift** the cursor "_" in the entered term as follows:







- press the arrow keys     until the function "Cursor to the left (<-)" or "Cursor to the right (->)" with the is marked with a border:  or .
- press  key until the desired character is underlined.

Example: Appenzzeller K+++

You can **delete** a character as follows:

- move cursor "_" to entered term until the character that you wish to delete is underlined.
- press the arrow keys     until the "Delete (Del)" function is marked with a border: .
- press key  until the character is deleted.
If you press the key  is pressed again, the character currently underlined by the cursor is then also deleted.

You can **save** the entered term and complete the entry as follows:

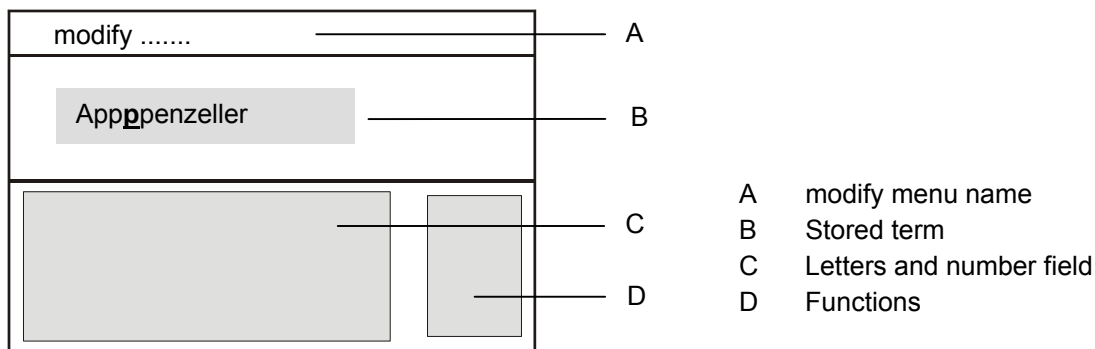
- press the arrow keys     until the "Save and end (End)" function is marked with a border: .
- press the  key.

A message is shown on the screen stating that the entry menu is being closed.
The term is entered and is then available under the respective program option "select".








8.2.2 Modifying data (Product names, users, production lines)

You can edit previously stored data using a modify menu provided by the OXYBABY, and recognisable by the term "modify", e.g. modify product. The keys can be operated as in the "Entering data" section (see above 8.2.1).



A darkened underline "_" denotes the cursor in the stored term (B).

When you enter a character, the character at this position changes to the new character just entered; and the old character is overwritten with the new one.

If you wish to delete the character, move the shaded border using the arrow keys     until the **Del** function is marked (see above 8.2.1). Then press the key .

More characters can also be added.



The existing log data will change!


8.3 Menu structure of OXYBABY® 6

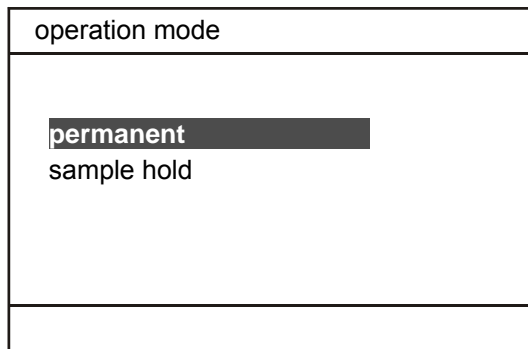
operation mode	permanent (see 8.4, and 5)
	sample hold (see 8.4, and 5)
products	select (see 8.5.1)
	export (see 8.5.2)
	generate (see 8.5.3)
	delete (see 8.5.4)
	modify (see 8.5.5)
user	select (see 8.6.1)
	export (see 8.6.2)
	generate (see 8.6.3)
	delete (see 8.6.4)
	modify (see 8.6.5)
line (Production line)	select (see 8.7.1)
	export (see 8.7.2)
	generate (see 8.7.3)
	delete (see 8.7.4)
	modify (see 8.7.5)
log data	show (see 8.8.1)
	delete (see 8.8.2)
	export (see 8.8.3)
calibration	O2 sensor Calibration point 0.0 % (For procedure see 9.1)
	O2 sensor Calibration point 20.9 % (For procedure see 9.2)
	CO2 sensor Calibration procedure 0.0 % (For procedure see 9.1)
	CO2 sensor Calibration procedure 100 % (For procedure see 9.3)







settings	date and time (see 8.10.1)	
	language (see 8.10.2)	Deutsch, English, Espanol, Italiano ...
	output (see Chapter 8.10.3)	search for Bluetooth device Bluetooth device (BT device) USB
	contrast (see Chapter 8.10.4)	
	brightness (see Chapter 8.10.5)	
	version (Oxybaby, device number, etc. see Chapter 8.10.6)	
	update (see 8.10.7)	

8.4 Selecting operation mode


- In the main menu, select the "operation mode" program option and run it using the key . The "operation mode" menu opens:

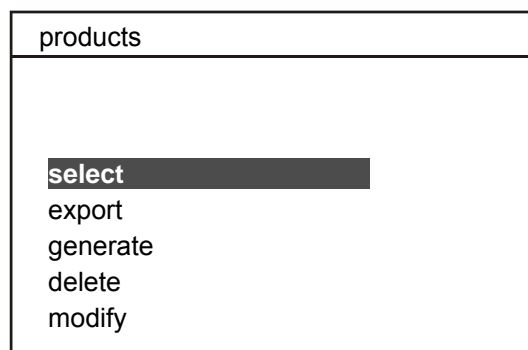


In the "operation mode" menu you can set the OXYBABY® to the permanent mode or the sample hold mode. The currently pre-selected program option appears in white lettering against a dark background:

- use the arrow keys  or  to select the permanent or sample Hold mode .
- press the  key.
- press the  key several times to return to the measuring window.

8.5 Selecting or managing products

- In the main menu, select the "products" program option and run it using the key . The "products" menu opens:






You can run these program options:

- select previously created products that you wish to measure (see 8.5.1).
- export product data on the export device that you configured in the "settings, output" program option (see Chapter 8.10.3).
- generate and store new products.
- delete existing products, where no log data are available on the corresponding product.
- modify existing products.


You can exit the "products" program option as follows.

- press  key and return to the main menu.





8.5.1 Selecting products

- In the "products" menu use the arrow key  or  to change to the "select" item and press the  key.
The "select product" menu opens and the currently pre-selected product appears in white lettering against a darkened background.

select product
<div style="background-color: black; color: white; padding: 2px;">Salami</div> Mortadella Salmon steak
Mortadella




- If you wish to leave the menu without making a change: press the key .

The lower line then displays the last-measured product, the middle shows the existing, created products.

- Use the  or  key to change to the desired product.
- Press the  key to select the product.
The newly selected product then appears in the lower line.
- Press the  key to return to the "products" menu.

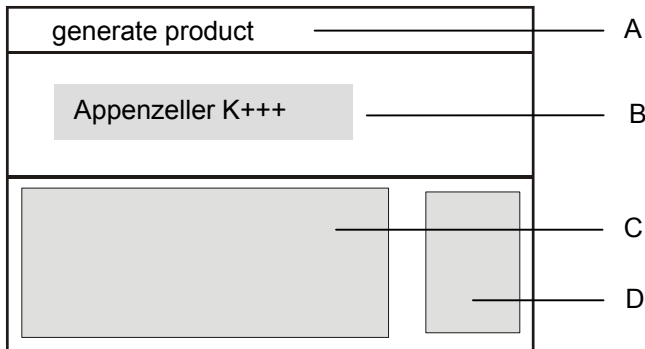
8.5.2 Exporting products

You can send all the stored products to a previously configured export device (see "settings, output" 8.10.3):

- Use the  or  key to change to the "export" program option.
- Press the  key. The OXYBABY sends the stored product data to the device and then returns to the "products" menu.

8.5.3 Generating products

The entry menu appears after selecting the "generate" menu item:



Details on operating the keys / functions are available in the Chapter 8.2. Details on entering new data see Chapter 8.2.1.

The "+++++" represent free character spaces **(B)**.

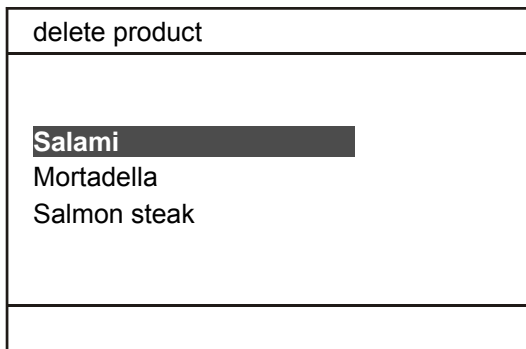
You can use the four arrow keys (▲ ▼ ◀ ▶) and the **(Enter)** key of the OXYBABY® to enter the new product (For details, see "Entering data", Chapter 8.2.1).

By using the four arrow keys and the **[End]** function you can save the new product and return to the "products" menu.

If you do **not wish to save** the product, press the **(ESC)** key, to exit the entry menu and return to the "products" menu.

8.5.4 Deleting products

The entry menu appears after selecting the "delete" menu item:



The currently pre-selected product appears in white lettering against a dark background:

- if you do **not wish to delete** a product, press the **(ESC)** key, to exit the "delete product " menu and return to the "products" menu.



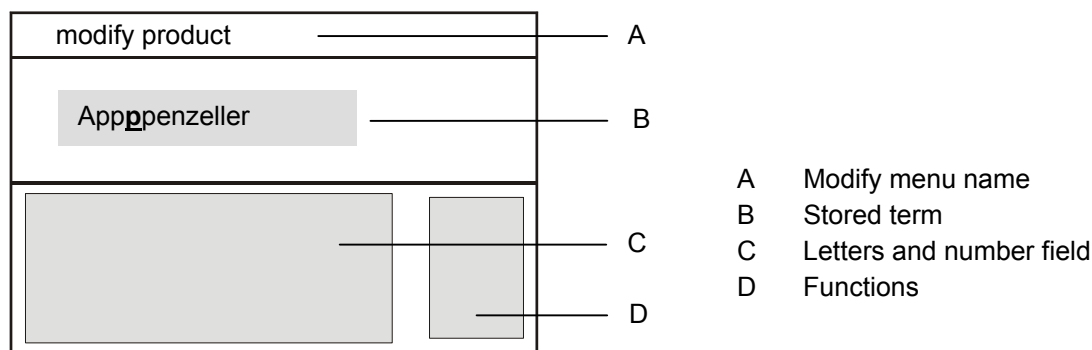
Log data must not exist for the product that you wish to delete.

- Use the arrow keys (▲ ▼) to select the product that you wish to delete.
- Press the **(Enter)** key. The product is deleted.
- Select another product to be deleted or press the **(ESC)** key and return to the "products" menu.

8.5.5 Modifying products

This product option enables you to modify the **currently selected product**. If you wish to change another product, select the product at "select" (see Chapter 8.5.1).

The entry menu appears after selecting the "product modify" menu item:



- If you do **not wish to modify** the product, press the **ESC** key, to exit without making a change and return to the "products" menu.



Details on changing stored data, see Chapter 8.2.2.

Details on operating the keys / functions, see Chapter 8.2.

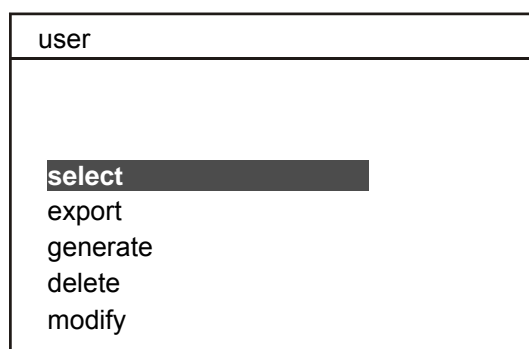
A darkened underline "_" denotes the cursor in the stored term (B).

The following editing options are available to you:

- move the cursor "_" in the stored term up to the position that you wish to change.
- the character that you wish to modify, overwrite or delete.
- enter a new character at the end of the term until the max. number of characters is reached.
- By using the four arrow keys **▲** **▼** **◀** **▶** and the **End** function you can save the changed product and return to the "products" menu.

8.6 Selecting or managing users

- In the main menu, select the "user" program option and run it using the **Enter** key. The "user" menu opens:



You can run these program options:


- select existing, previously created user.
- export user data on the export device that you configured in the "settings, output" program option (see Chapter 8.10.3).
- generate and store new user.
- delete given user when no log data are available.
- modify existing users.
- Press the **ESC** key to return to the main menu.

8.6.1 Selecting user





- In the "user" menu use the arrow key  or  to change to "select" and press the  key.

The "select user" menu opens and the currently pre-selected user appears in white lettering against a darkened background.

select user
Meissner
A. Meier
M. Müller
Meissner




- If you wish to leave the menu **without making a change**: press the key .

The lower line then displays the last-active user, the middle shows the existing, created user.

- Use the arrow key  or  to change to the desired user name.
- If you wish to select the user name: press the  key. The newly selected user then appears in the lower line.
- Press  key to return to the "user" menu.

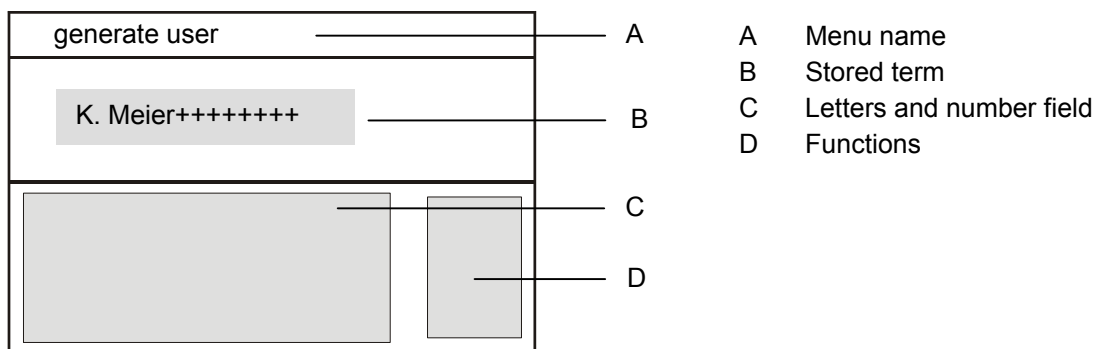
8.6.2 Exporting user

You can send all the stored users to a previously configured export device (see "settings, output", Chapter 8.10.3):

- use the  or  key to change to the "export" program option.
- press the  key. The OXYBABY sends the stored product data to the device and then returns to the "user" menu.






8.6.3 Generating users


The entry menu appears after selecting the "generate" menu item:



Details on operating the keys / functions are available in the Chapter 8.2. Details on entering new data are available in Chapter 8.2.1.

The "+++++++" represent free character spaces (**B**).

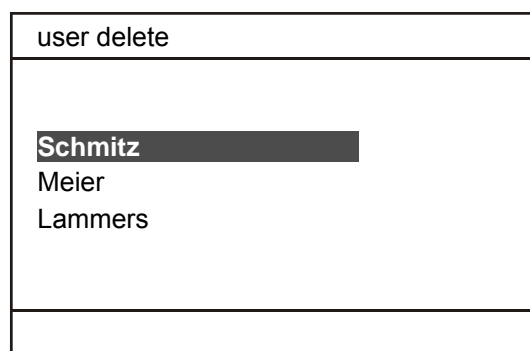
Enter new user names using the four arrow keys     and the  key (For details see "Entering data", Chapter 8.2.1).

Save the new user name using the four arrow keys and the "" function and then return to the "user" menu.


If you do **not wish to save** the user name, press the  key to return to the "user" menu.

8.6.4 Deleting users

The "user delete" menu appears after selecting the "delete" menu item:







The currently pre-selected user appears in white lettering against a dark background:

- if you do **not wish to delete** a user, press the  key, to exit the "delete" menu and return to the "user" menu.



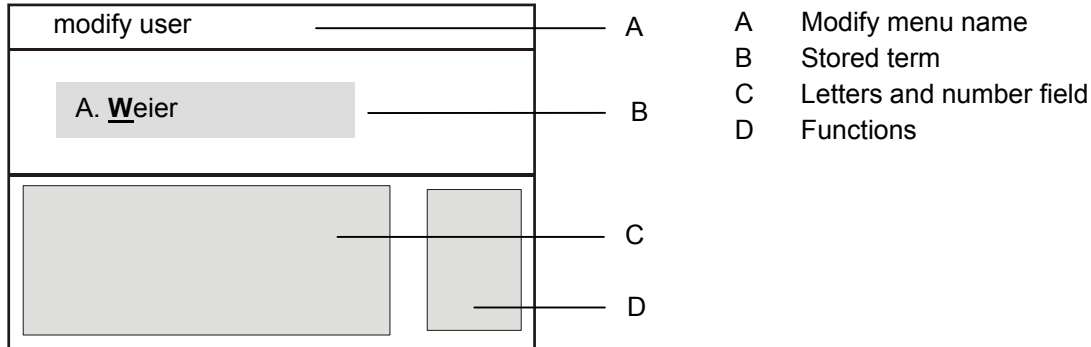
Log data must not exist for the user that you wish to delete.

- Use the arrow keys   to select the user that you wish to delete.
- Press the  key. The user is deleted.
- Select another user to be deleted or press the  key and return to the "user" menu.

8.6.5 Modifying users

This product option enables you to modify the **currently active user**. If you wish to modify another user, select the user at "select user" (see Chapter 8.6.1).

The entry menu appears after selecting the "modify " menu item:



- If you do **not wish to change** the user, press the key, to exit without making a change and return to the "user" menu.




Details on changing stored data, see Chapter 8.2.2.
Details on operating the keys / functions, see Chapter 8.2.

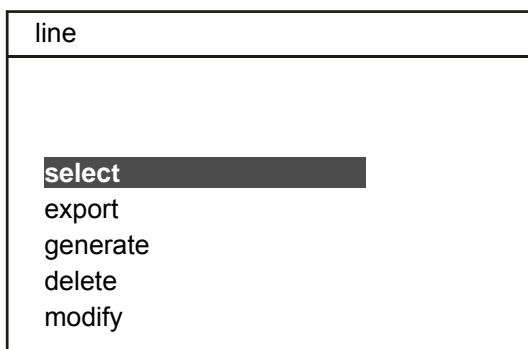
A darkened underline "_" denotes the cursor in the stored term (B).

The following editing options are available to you:

- move the cursor "_" in the stored term up to the position that you wish to change.
- the character that you wish to change, overwrite or delete.
- enter a new character at the end of the term until the max. number of characters is reached.
- By using the four arrow keys and the "" function you can save the changed product and return to the "user" menu.

8.7 Selecting or managing lines (production line)


- In the main menu, select the "line" program option and run it using the key . The "line" menu opens:






You can run these program options:

- select existing, previously created lines (production lines).
- export production data (lines) on the export device that you configured in the "settings, output" program option (see Chapter 8.10.3).
- generate and store new lines.
- delete lines when no log data are available.
- modify existing lines.

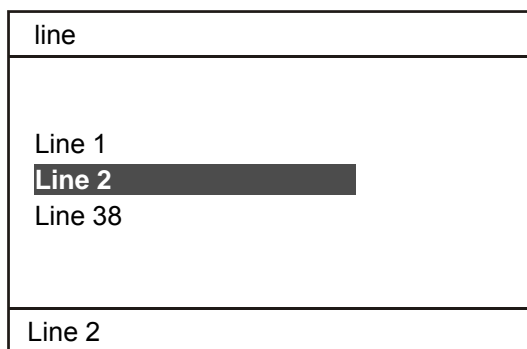
You can exit the "line" program option as follows:

- press the  key and return to the main menu.

8.7.1 Selecting line





- In the "line" menu use the arrow key  or  to change to the "select" menu item and press the  key.

The "line select" menu opens and the currently pre-selected line appears in white lettering against a darkened background.



- If you wish to exit the **menu without making any changes**: press the  key.

The lower line then displays the last-selected line, the middle shows the existing, created lines (production lines).

- Use the arrow key  or  to change to the desired line.
- If you wish to select the line:
press the  key.
The newly selected line then appears in the lower line.
- Press the  key to return to the "line" menu.

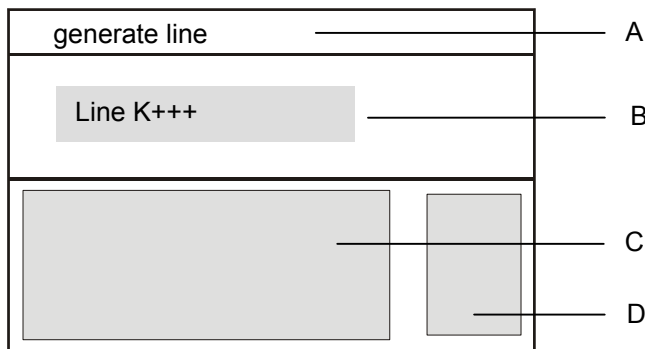
8.7.2 Exporting lines

You can send all the stored lines (production lines) to a previously configured export device (see "settings, output", Chapter 8.7.2):

- use the or key to change to the "export" program option.
- press the key. The OXYBABY sends the stored lines (production lines) to the device and then returns to the "user" menu.

8.7.3 Generating lines

The entry menu appears after selecting the "generate" menu item:



Details on operating the keys / functions are available in the Chapter 8.2. Details on entering new data are available in Chapter 8.2.1.

The "+++++" represent free character spaces **(B)**.

You can use the four arrow keys , , , and the key to enter the new line (production line) (For details see "Entering data", Chapter 8.2.1).

By using the four arrow keys and the "**End**" function you can save the new line and return to the "line" menu.

If you do **not wish to save** the line, press the key, to exit the entry menu and return to the "line" menu.

8.7.4 Deleting lines

The entry menu appears after selecting the "delete" menu item:

delete line
Line 12
Line K12
Line 11

The currently pre-selected line appears in white lettering against a dark background:

- If you do **not wish to delete** a line, press the **(ESC)** key, to exit the "delete" menu and return to the "line" menu.



Log data must not exist for the line (production line) that you wish to delete.

- Use the arrow keys **(▲)** **(▼)** to select the line that you wish to delete.
- Press the **(Enter)** key. The line is deleted.
- Select another line to be deleted or press the **(ESC)** key and return to the "line" menu.

8.7.5 Modifying lines

This product option enables you to modify the **currently selected line**. If you wish to change another line, select one at "select line" (see Chapter 8.7.1).

The entry menu appears after selecting the "modify" menu item:

modify line	A
Line K12	B
<input type="text"/>	C
<input type="text"/>	D

A modify menu name
B Stored term
C Letters and number field
D Functions

- If you do **not wish to change** the line, press the **(ESC)** key, to exit without making a change and return to the "Line" menu.



Details on changing stored data, see Chapter 8.2.2.

Details on operating the keys / functions are available in Chapter 8.2.

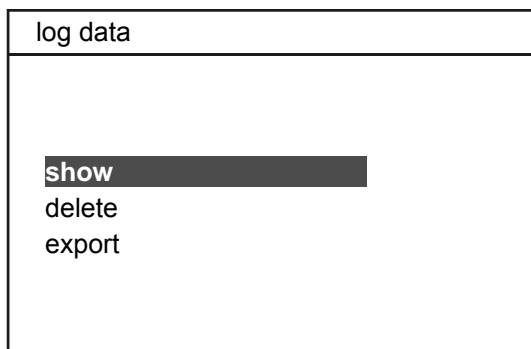
A darkened underline "_" denotes the cursor in the stored term **(B)**.

The following editing options are available to you:

- move the cursor "_" in the stored term up to the position that you wish to change.
- the character that you wish to change, overwrite or delete.
- enter a new character at the end of the term until the max. number of characters is reached.
- By using the four arrow keys **(▲)** **(▼)** **(◀)** **(▶)** and the **"End"** function you can save the changed line and return to the "line" menu.

8.8 Log data (stored measurement data)

After selecting the "log data" menu item in the main menu, the "log data" menu opens:



The currently pre-selected program option appears in white lettering against a dark background.

You can run these program options:

- display stored measurement data (log data)
- delete stored measurement data (log data)
- export measured data (log data) on the export device that you configured in the "settings, output" program option (see Chapter 8.10.3).

You can exit the "log data" program option as follows:

- press the **ESC** key and return to the main menu.

8.8.1 Displaying log data

You can display previously stored measurement data (log data) using this program option.

- Use the arrow key **▼** or **▲** to change to the "show" menu item.
- Press the **Enter** key.




The " show log data " menu is then shown on the display:

show log data			
➔	20.9 %	O2	2.8 % CO2
	20.7 %	O2	2.9 % CO2
	20.8 %	O2	2.9 % CO2
17.04.2009		15:14:08	
Salami			
A. Meier			
Line K			

The middle part of the menu shows the concentration values for the measurements. The arrow **➔** highlighted in bold, indicates the currently selected measurement, it displays the gas concentration values.



Additional data for the currently selected measurement is shown in the bottom part of the menu:

- measurement date and time
- product, currently selected at the time of the measurement
- user, currently selected at the time of the measurement
- line, currently selected at the time of the measurement

- If you wish to change to other stored measurements, press arrow key  or .
- If you wish to return to the Measuring and display mode, press the  key, to return to the measurement window.

8.8.2 Deleting log data




A safety prompt appears after selecting the "delete" menu item:

- if you do **not wish to delete the log data**, press the  key and return to the "log data" menu
- If you wish to delete the log **data**, press the  key.

All log data have been deleted.

8.8.3 Exporting log data

You can send all the measured data (log data) to a previously configured export device (see "settings, output", Chapter 8.10.3):

- use the  or  key to change to the "export" program option.
- press the  key. The OXYBABY sends the stored measured data (log data) to the device and then returns to the "log data" menu.

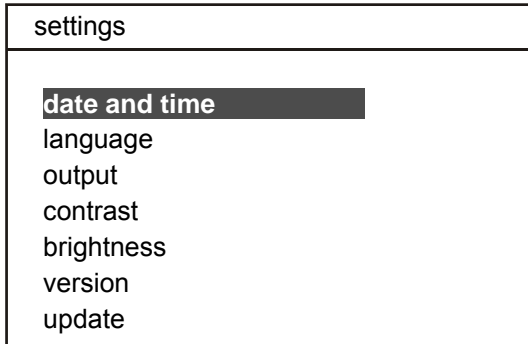
8.9 Calibration

After selecting the "calibration" menu item in the main menu, the "calibration" menu opens. The "Calibration" Chapter (see Chapter 9) describes in detail how you calibrate the OXYBABY®.

calibration		
O2	Sensor	0.0 %
O2	Sensor	20.9 %
CO2	Sensor	0.0 %
CO2	Sensor	100 %

8.10 Settings

After selecting the "settings" menu item in the main menu, the "settings" menu opens:



The currently pre-selected program option appears in white lettering against a dark background.

You can run these program options:

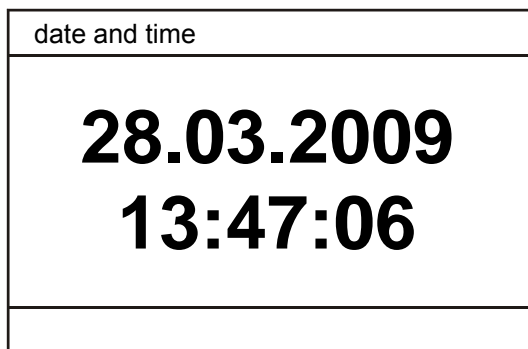
- set date and time
- set menu language
- set data export at external medium
- set display contrast and brightness
- "version" enables you to display information on the OXYBABY®.
- "update" can be used to update the operating program for the OXYBABY®
- Use the arrow key or to change to the desired program option.
- Press the key to run the program option.

You can exit the "settings" program option as follows:

- press the key and return to the main menu.

8.10.1 Date and time

After selecting the "date and time" menu item in the "settings" menu, the corresponding menu then opens:







If you do **not wish to change** the data and time, press the key, to exit the entry menu and return to the "settings" menu.




The clock keeps running in the background while you are setting the date and time.

- Press the right arrow key . The entry screen appears under the first number.
- The right and left arrow keys enable you to move the cursor " _ " under the number that you wish to change.

- You can use the arrow keys  and  to change the numerical value.
- To accept changes press the  key.
- If you **do not wish to accept** the changes, press the  key.





The OXYBABY® returns to the display mode.

- Press the  key, to exit the menu and to return to the "settings" menu.


8.10.2 Language

After selecting the "language" menu item in the "settings" menu, the "language" menu appears. The currently pre-selected language appears in white lettering against a dark background. The title bar at the top right always shows the name of the language in English. The lower line shows the language in which the menu is currently being displayed.

language	German
Deutsch	
English	
Espanol	
Italiano	
Nederlands	
Deutsch	

- If you do **not wish to change the language**, press the  key and return to the "Settings" menu.
- Use the arrow keys  and  to select the desired language.
- Press the  key.

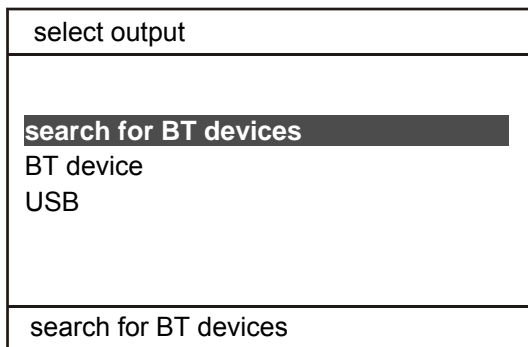
The English designation in the title bar changes to match the new language. In the lower line the display shows the name of the language in the selected language. The text in the menus is then in the newly selected language.

- Select another language or press the  key and return to the "settings" menu.

8.10.3 Output

After selecting the "output" menu item in the "settings" menu, the "select output" menu appears. The currently pre-selected program option appears in white lettering against a dark background.

You can select one of the following options to export the data:




- search for Bluetooth (BT) devices and connect to one of the Bluetooth devices that are found
- a Bluetooth device previously connected to the OXYBABY
- export by way of the USB interface

 ***The Bluetooth specifications for the OXYBABY® are available in the Technical data.***

 ***If you use a USB hub: the USB hub must be powered through a power supply unit.***

- Use the arrow keys  and  to select the desired export.
- Press the  key.

The chosen export device is defined for all export menus on the OXYBABY®. The lower line of the display shows the export device's designation.

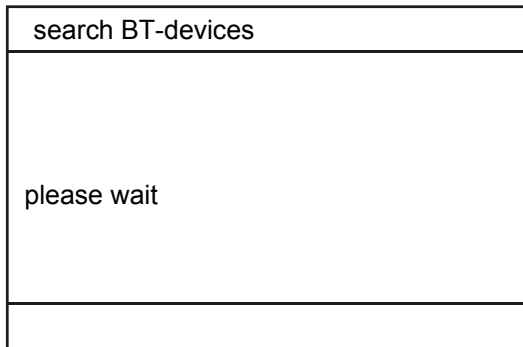
- Configure another export or press the  key and return to the "settings" menu.



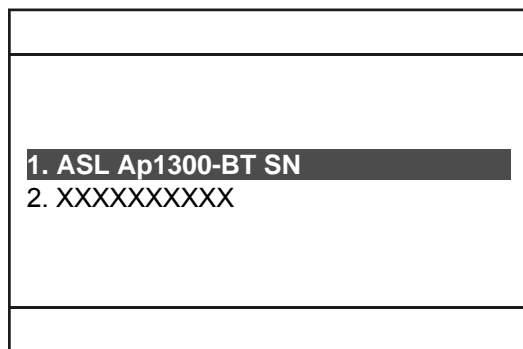
8.10.3.1 Searching for Bluetooth devices and connecting to them






Make sure that the Bluetooth device to which you wish to connect, is switched on and operational (see manufacturer's instructions).







The title bar changes to "search BT-devices" and the "please wait" message flashes on and off. If the OXYBABY does not find any Bluetooth devices, repeat the search several times. It may be that the desired Bluetooth device is temporarily unavailable.



- Use the arrow keys  and  to select the desired Bluetooth device.
- Press the  key.

The title bar changes to "Bluetooth device connect" and the "please wait" message flashes on and off until the "connected" message confirms that the Bluetooth device is connected.

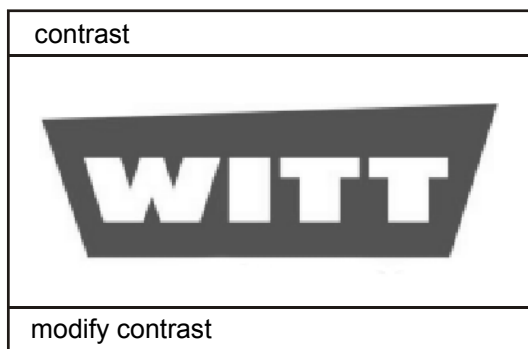
- Press the  key to return to the "output select" menu.
- Use the arrow keys  and  to select the "Bluetooth device" export.
- Press the  key.

The Bluetooth device is selected and connected to the OXYBABY[®], the lower line in the display shows the Bluetooth device's designation.

- Press the  key to return to the "settings" menu.

8.10.4 Contrast

After selecting "contrast" in the "settings" menu, the "contrast" menu appears.



- If you do **not wish to change the contrast**, press the **(ESC)** key and return to the "settings" menu.

 **The display then immediately shows the changes without saving them permanently.**

Increasing contrast:

- press arrow key **(▶)** or **(▲)** once or several times.

Decreasing contrast:

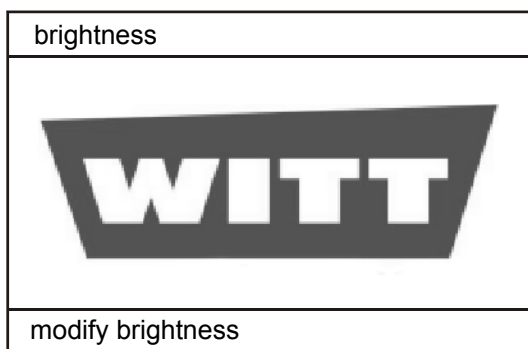
- press arrow keys **(◀)** or **(▼)** once or several times.

Once the desired contrast has been reached:

- press the **(Enter)** key to save the contrast setting.
- Press the **(ESC)** key to return to the "settings" menu.

8.10.5 Brightness

After selecting "brightness" in the "settings" menu, the "brightness" menu appears.



- If you do **not wish to change** the brightness, press the **(ESC)** key and return to the "settings" menu.

 **The display then immediately shows the changes without saving them permanently. You can choose between two brightness levels.**

Increasing brightness:



- press arrow key **(▶)** or **(▲)**.



Decreasing brightness:

- press arrow keys ◀ or ▼.

Once the desired brightness has been reached:

- press the  key to save the brightness setting.
- press the  key to return to the "settings" menu.

8.10.6 Version

After selecting "version" in the "settings" menu, the "show version" menu appears.

show version	
OXYBABY VI	08.May 09
Device no.	12345678
DSP module	G1 - 010101
LDP module	L1 - 010102
CO2 module	L1 - 010102
MIO module	M2 - 030101

The display shows the OXYBABY® version, the device number and some manufacturer-specific data.

If you wish to exit the "version" menu:

- press the  key to return to the "settings" menu.


8.10.7 Update

You can update the OXYBABY® operating software. The update is available on an SD card. During an update all the entered data (products, lines, users) and all log data are retained.

- Fold down lug on right side.
- Connect USB power supply unit to the OXYBABY®.
- Slide the update SD card as far as possible into the SD interface until it latches into place. The contacts must be aligned towards the OXYBABY® and face upwards to the display.



Do not use force to insert the SD card into the SD interface. Otherwise you will damage the SD card or the OXYBABY®

- In the "Settings" menu:
use the arrow keys ▼ and ▲ to change to the "update" menu item.
- Press key  to run the update.


The OXYBABY® display is darkened while the update process is active (lasts up to 5 minutes). An LED next to the SD interface signals the end of the update process.




The OXYBABY® has to be connected to the USB power supply unit during the update.

Following a successful update, the display returns to the measuring and display screen.




9 Calibration

 **The OXYBABY® has to be calibrated at regular intervals.**
For the majority of applications a weekly calibration will be sufficient, however, for more accurate test results, it is advisable to run a calibration before starting an actual test.
Changes to the ambient conditions (e.g. powerful vibrations during transit or significant changes in temperature) then require calibration to be performed!

 **Make sure that the device is stable during each calibration process.**

 **For accurate test results we advise calibrating the O₂ sensor first and then the CO₂ sensor.**
 Calibration of the OXYBABY® is conducted in four stages:

- calibration of the zero point for O₂ analysis.
(Recommended is 100 per cent by volume N₂ or argon)
- calibration of the zero point for CO₂ analysis.
(Recommended is 100 per cent by volume N₂ or argon)
- calibration of the calibration point for O₂ analysis.
- calibration of the calibration point for CO₂ analysis.
(Recommended is 100 per cent by volume CO₂)


In the "calibration" menu (see Program options Chapter 8.9):
 select the desired calibration process using  and  and start with .

The upper bar in the display flashes on and off as long as the calibration process is active. Once the calibration process has finished, an acoustic signal is sounded and the upper line of the display stops flashing.




Caution!
For all measuring and calibration processes make sure that the measuring cell in the OXY-BABY® does not have pressure applied to it. The gas to be analysed must always be aspirated by the integrated pump at atmospheric pressure (= ambient pressure).
Do not suck in any fluids!
Non-observance of this may result in incorrect measurements, or damage to the device.


9.1 Calibrating zero point (O₂ or CO₂)

 **Do not use CO₂ as a zero gas to calibrate the zero point of the O₂ sensor. Non-observance of this may result in incorrect measurements.**

- To calibrate the zero point – for each gas – use a suitable zero gas cylinder (see Technical data), install a pressure regulating valve at the zero gas cylinder and then connect a protective sleeve or a piece of loose hose to the pressure regulating valve's outlet side.
- Allow the gas to flow freely at as low a pressure and flow rate as possible through the hose to the environment.

Only after the pressure regulating valve/hose system has been sufficiently rinsed (to displace the ambient air):

- hold the needle in the OXYBABY® in the hose so that the flowing gas can be sucked-in. Then start the calibration with .

 **Insert the needle far enough into the hose to ensure that gas does not accumulate in the hose and pressure is not built up!**
Keep the needle in the hose until the calibration process has been completed.

- Wait until an acoustic signal is sounded.

The OXYBABY® automatically accepts the calibration value. At the same time, the display is corrected to 0.0 % if necessary.




9.2 Calibrating measuring point for O₂



You can calibrate the measuring point (20.9%) using fresh, clean ambient air!



Calibration is to be performed using clean oil and pure air, as otherwise the chemical measuring cell may be damaged!

- In the "calibration" menu:
select the "O₂ sensor 20.9%" calibration using  and  and start with .
- Make sure that pressure is not built up at the needle inlet.
- Wait until an acoustic signal is sounded.
- The OXYBABY[®] automatically accepts the calibration value.
At the same time, the display is corrected to 20.9%.

9.3 Calibrating measuring point for CO₂



For accurate test results we advise calibrating the O₂ sensor first and then the CO₂ sensor!

- When calibrating the CO₂ measuring point, use a suitable calibration gas cylinder (see Technical data).
- Install a pressure regulating valve on the calibration gas cylinder and connect a protective sleeve or a loose piece of hose to the outlet side of the pressure regulating valve.
- Allow the gas to flow freely at as low a pressure and flow rate as possible through the hose to the environment.




Then - only - after the pressure regulating valve/hose system has been sufficiently purged (to displace the ambient air):

- hold the needle in the hose so that the flowing gas can be sucked-in.



Insert the needle into the hose far enough to ensure that gas does not accumulate in the hose and that pressure is not built up.

Keep the needle in the hose until the calibration process has been completed.

- In the "Calibration" menu:
select the "CO₂ sensor 100 %" calibration using  and .
- Start calibration with .
- Wait until an acoustic signal is sounded.
- The OXYBABY[®] automatically accepts the calibration value.
At the same time, the display is corrected to, e.g. 100% CO₂.

10 Fault messages / warnings

 **Each time the device issues a fault message an acoustic warning is sounded. The respective warning flashes in the display!**

Fault message	Cause	Remedy
zero gas high	O ₂ or CO ₂ content in supplied gas $\geq 7.0\%$	Supply gas with 0% O ₂ or CO ₂ content
battery low	Rechargeable battery has to be charged	Connect OXYBABY® to supplied power supply unit / charger
sensor defect	Needle / filter clogged up O ₂ sensor faulty	Check needle and filter for signs of clogging, and then clean or replace, if necessary Replace O ₂ sensor
needle blocked	Needle / filter clogged up	Check needle and filter, clean or replace if necessary
calibration not possible	Wrong gas Intermittent gas flow Too much pressure on hose line with zero gas / calibration gas	Check gas Check measuring path for any contamination Set a low pressure on the calibration gas cylinder's pressure regulating valve
Display remains dark	Power supply unit or rechargeable battery faulty.	Rule out any other causes (see Chapter 11.3), if faulty, send OXYBABY® to the WITT after-sales service
The OXYBABY® does not "hum" when you start the measurement.	Pump faulty	Rule out any other causes (see Chapter 11.4), if necessary, send OXYBABY® to the WITT after-sales service

11 Maintenance, care and repair assistance

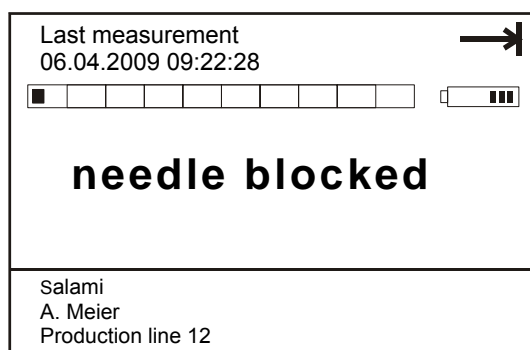
The OXYBABY® will operate reliably for many years with a low maintenance and care requirement if you observe the following points:

- use flawless filters only
Contaminated filters can inhibit the measuring gas flow rate through the measuring cell or it may fail to sufficiently filter foreign bodies out of the measuring gas.
- check the measuring gas passage through the needle occasionally.
If it is clogged up, the measuring gas can no longer access the measuring cell. This will result in measuring errors. Clogged up or bent needles must be replaced immediately with new ones.
- clean the casing of the OXYBABY® using a dry or slightly moist cloth only.
Do not use any cleansing agents. Never clean the device with water or other cleaning fluids.
- avoid subjecting the casing to any strong vibrations.
- calibrate the OXYBABY® regularly, for example before starting any measurements.

11.1 Needle or filter clogged up

The OXYBABY® needle or filter are clogged up or the device is faulty:


- when "needle blocked" is shown on the display.
- where there is no difference in concentration levels between a measurement on packaging and a measurement of ambient air.



Test in "sample hold" operation mode:

- perform measurement on packaging (see.7.3)

Reference measurement using zero gas:

- remove filter and needle of OXYBABY® (see below and Fig. 2)
- perform measurement with zero gas:
 - use a suitable zero gas cylinder – for each gas (see Technical data). Install a pressure regulating valve onto the zero gas cylinder, then connect a protective sleeve or a loose piece of hose to the outlet side on the pressure regulating valve.
 - allow the gas to flow freely at as low a pressure and flow rate as possible through the hose to the environment.
 - after the pressure regulating valve/hose system has been sufficiently purged (to displace the ambient air), hold the OXYBABY® needle in the hose so that the flow of gas can be sucked in. Then start the measurement with .



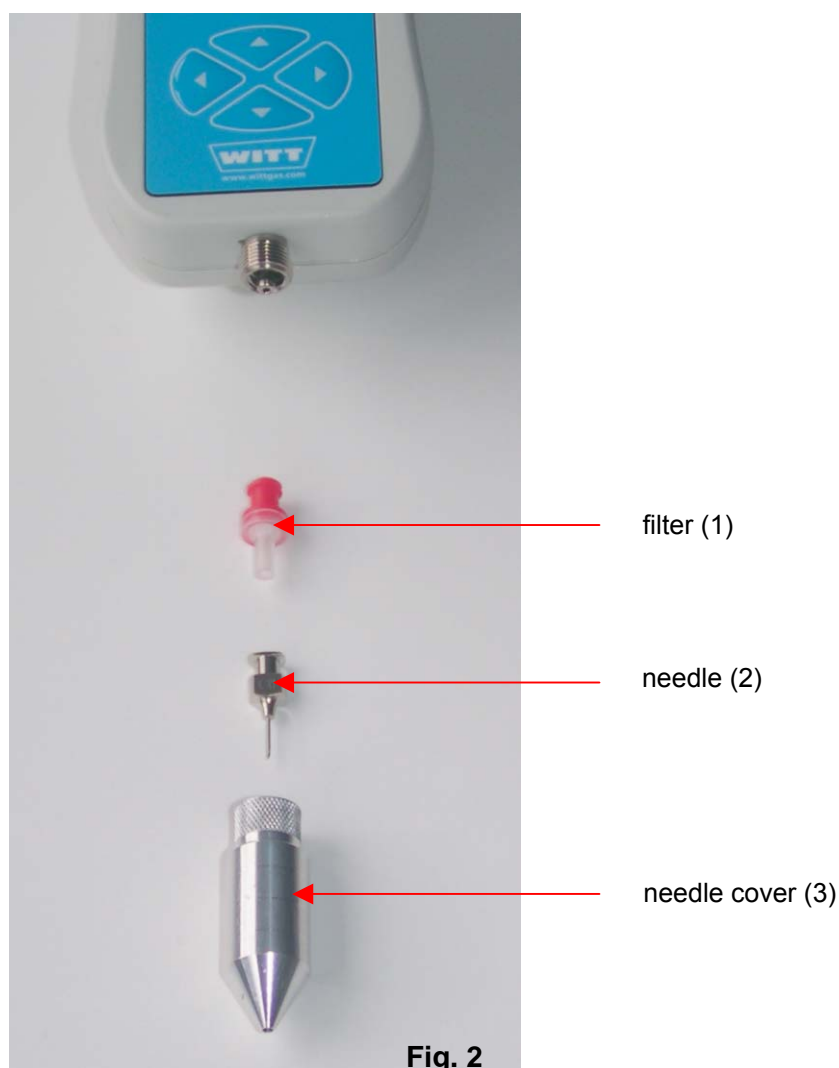
Insert the needle into the hose far enough to ensure that gas does not accumulate in the hose and that pressure is not built up.



Proceed in accordance with the result of the measurements mentioned above:

Result of measurements.	What is to be done?
No difference in concentration levels between measurement of a packaging and the measurement of zero gas (without needle and filter).	Send device to WITT after-sales service
Difference in concentration level between the measurement of packaging and the measurement of zero gas.	Replace filter (see below) / check needle (see below)

Replace filter or needle:



- Unscrew needle cover **(3)** in counterclockwise direction.
- Replace filter **(1)**.
- Check needle **(2)** for flow rate:
 - pierce needle **(2)** with included fine wire. If this is not possible, replace needle.
- If the fault persists, send the device to WITT after-sales service.



Caution:
never use the OXYBABY® without a filter!

11.2 Changing O₂ sensor

During each calibration process, the OXYBABY® checks the condition of the O₂ sensor. If it is worn-out or faulty, the "sensor defect" message is shown on the display.

How to change the O₂ sensor.

- Switch off the device.
- If plugged in:
detach USB cable or USB mains cable.
- On the rear side of the OXYBABY®:
unscrew the 6 fastening screws and open the casing.
- Detach electrical connector (plug (3)).



Plug (3)

- Remove screw (1) from O₂ sensor.



Screw (1)

- Carefully remove O₂ sensor from casing.
- Unscrew the sensor by turning the knurled nut (4) in a counterclockwise direction.



Knurled nut (4)



Caution!

Make sure during assembly that hoses and cables are not damaged, crushed or kinked. Screw the O₂ sensor in a clockwise direction far enough into the knurled nut, until the sensor thread is hidden completely by the knurled nut.

- Install the new O₂ sensor in reverse order.
- Switch on device.
- The device now needs to be calibrated (see Chapter 9) .

11.3 Power supply unit or rechargeable battery faulty



Use the USB power supply unit / charger as supplied only!
Otherwise the OXYBABY® may not function correctly. WITT-Gasetechnik will not be held liable for any damage caused by external power supply units or chargers.

If the display on your OXYBABY® remains dark, the rechargeable battery or the power supply unit may be faulty.

Check the **power supply unit** for your OXYBABY® as follows:

- if plugged in, detach the USB power supply unit or USB cable from interface of OXYBABY®.
- press **GO** key, to try and start the device in rechargeable battery mode.
 This is only possible when the rechargeable battery is still charged.
 If the display lights up and shows the measuring and display screen:
 - press **ESC** key for approx. 2 seconds and hold. The device is now automatically purged with air and it then switches off.
 - insert combined USB charging cable / power supply unit cable into USB connection on the OXYBABY®.
 - insert plug of USB charging cable / power supply unit cable into socket on power supply (see Technical data).

If the display remains dark, try to power up the OXYBABY® from a PC using the USB cable provided. If you use a USB hub: the USB hub must be powered through a power supply unit.

 **It may be necessary to try it out on several PCs, it will only work on a PC that is compatible with the USB standards.**


- Insert USB cable into USB connection on the OXYBABY®.
- If the display lights up and shows the measuring and display screen, the power supply unit is faulty. Order a new power supply unit (order number see Chapter 3, scope of delivery).
- If the displays stays dark, send the device to WITT after-sales service.

Check the **rechargeable battery** for your OXYBABY® as follows:

- charge rechargeable batteries for min. 3 hours (see Chapter 6.1).
- then detach the power supply unit from the USB interface on the OXYBABY®.

The device switches off after a short period while you are using it.

In this instance the rechargeable battery is faulty. Send the device to the WITT after-sales service.

 **Please do not confuse this with the automatic switch-off function, which is enabled when the device is not used. The Oxybaby® switches off automatically if it does not receive any commands for approx. 2 minutes (e.g. key actuations or measurements). (see Chapter 7.4).**

11.4 Pump faulty

The device does not "hum" once the measurement has been started.

The first thing to do is rule out other causes.

- Check whether the needle or filter are clogged up (see Chapter 11.1).
- Check whether a hose has been kinked or has been crushed.
 - Switch off the device.
 - If plugged in:
detach USB cable or USB mains cable.
 - On the rear side of the OXYBABY®:
unscrew the 6 fastening screws and open the casing.
 - Check hoses, if kinked or defective, send the OXYBABY® to the WITT after-sales service.
 - After checking:
close the casing and screw back together again using 6 fastening screws.

If no other cause can be determined, send the OXYBABY® to the WITT after-sales service.

12 Reading out data from the OXYBABY®

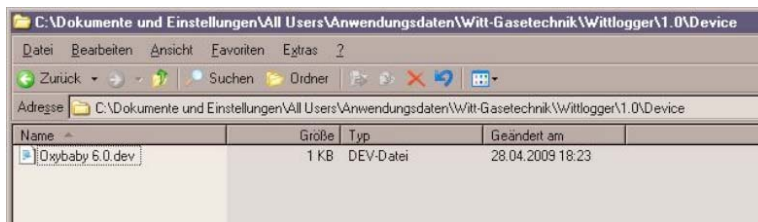
The necessary USB driver software is delivered on CD along with the OXYBABY®.

If you connect the OXYBABY® to a PC and the driver is required, please insert the CD included and refer to the "Drivers" directory in the CD during installation:


- start the "OXYBABY_6_USB-Driver.exe" installation program filed there.
After installing the USB driver you must reboot the PC.


You will need the WITT Logger PC application, developed specifically by WITT-GASETECHNIK with its reliable and comfortable menu navigation, to be able to use the analysis results. Further details on systems requirements, installation and operation of the WITT Logger PC application are available on the CD included in the package contents.

Following installation of the WITT Logger application, you must create a new folder and save a special device file for OXYBABY® 6 in it.



- On your PC open the following folder:
"Documents and Settings\All Users\Application Data\Witt-Gasetechnik\Wittlogger\1.0".
- If a "Device" folder has not yet been created, create a new folder and name it "Device".
- Copy the "Oxybaby 6.0.dev" file (from the "Drivers" folder on the CD included in the package contents) into the "Device" folder. You have to boot the PC again.

 **The WITT Logger PC application will not operate if the language on the OXYBABY® is configured for Russian or Japanese.**

 **The WITT Logger PC application (demo) is fully functional.
For each session, 5 analysis values are displayed, the application then switches back into the Demo mode.
To enable the WITT Logger PC application, contact WITT-GASETECHNIK.**

13 Holder / table stand (option)

You can use the holder / table stand to set up the OXYBABY® in a space-saving and reliable manner. It is mounted onto a holder, which has supports at the left and right for the needle. You can route the USB cable or mains cable through the hole in the holder.



14 Technical data

Erection (application):	interior	(Hand-held device)
Degree of contamination:	2 (with regard to leakage paths according to VDE 0160)	
Degree of protection:	IP54	
Storage temperature:	min. -20 °C	max. 70 °C
Operating ambient temperature:	min. 5 °C	max. 40 °C
Gas inlet temperature:	min. 5 °C	max. 40 °C
Relative air humidity:	≤ 90 %, non-condensing at +20 °C ≤ 50 %, non-condensing at +40 °C	
Maximum operating altitude:	max. 4000 m above mean sea level.	
Dimensions (HxWxD) in mm:	187 x 106 x 91	
Weight:	approx. 600 g	
Analysis gases:	CO ₂ , O ₂ and their mixtures in non-combustible, non-toxic and non-corrosive gases	
Analysis gas inlet pressure:	700 – 1300 mbar (abs.)	
Calibration gas inlet pressure:	700 – 1300 mbar (abs.)	
Measuring gas consumption:	< 6 ml (OXYBABY® 6)	
Measuring time:	6 - 10 s (OXYBABY® 6)	
Adaptation to large temperature fluctuations:	approx. 1 hour	
Stored measuring data:	max. 500 data records (ring buffer)	
Measuring cycles:	approx. 250 with one rechargeable battery charge	
Rechargeable batteries:	3 integrated rechargeable batteries (3 nickel-metal-hydride, type AA, each Capacity: min. 2,700 mAh @ 1.2 V)	
Power supply (power supply unit):	100 – 240 V, 0.2A, 50 – 60 Hz	
Corresponds to safety requirements:	EMC specification 2004/108/EG Low-voltage specification 2006/95/EG	
O₂ analysis		
Sensor:	electrochemical	
Sensor signal:	for brand-new sensor: 9-13 mV to air (20.9 per cent by vol. O ₂)	
Measuring range:	0 to 100 per cent by volume O ₂ in inert gas	
Measuring accuracy:	0.1 % absolute with O ₂ concentrations ≤ 10 per cent by vol. 1 % relative with O ₂ concentrations 10-100 per cent by vol. at 20 °C, measured under calibration conditions	
Response time (t ₉₀):	≤ 5 s	
Service life:	≥ 2 years (in air at 20 °C), replaceable	

Note:

the service life is significantly dependent on the O₂ concentration level of the gas to be analysed!

Sensor service life = 360000%-h at 20 °C.

Example for sensor with gas mixture 21% O₂ in CO₂:
360000%-h : 21% : 24h = 714 operating days = 1.96 years

Example for sensor with gas mixture 80% O₂ in CO₂:
360000%-h : 80% : 24h = 187 operating days = 0.51 years

Zero gas (recommended): 100% N₂ or 100% argon
Calibration gas (recommended): Air (20.9 per cent by volume O₂ in N₂)



CO₂ analysis

Accompanying gases:	non-combustible, non-corrosive gases (typical: N ₂ , O ₂ , optional Ar)
Measuring principle:	IR adsorption
Measuring range:	0...100 per cent by volume
Measuring accuracy:	±2% FS at 20 °C (±2% CO ₂)
Service life:	practically non-wearing
Measurement type:	random sample/continuous
Response time:	≤ 5 s
Relative air humidity:	≤ 90 %, non-condensing at +20 °C, ≤ 50 %, non-condensing at +40 °C
Operating temperature range:	0...+40 °C, non-condensing
Calibration type:	2 point calibration (0-point, measuring range)
Zero gas (recommended):	100% N ₂ or 100% argon
Calibration gas (recommended):	100% CO ₂
Max. operating pressure (Ü):	Atmosphere

Bluetooth specifications:

Bluetooth versions:	Bluetooth 2.0 EDR/ 2.0 / 1.2 / 1.1
Frequency:	2402 - 2480MHz
Transmission method, modulation:	FHSS (Frequency Hopping Spread Spectrum) / GFSK (Gaussian Frequency Shift Keying)
Codification:	128 bit
Channels:	79 channels each with 1 MHz bandwidth
Transfer rate:	9600 baud
Transmission power (Class 1):	max.15 dBm (output level relative to 1 mW)
Receiver (sensitivity):	-80dBm typ. (output level relative to 1 mW)
Range (Class 1):	max. 100 m (open ground)
Type of Bluetooth device:	master