Lovibond® Water Testing

Tintometer® Group

SD 400 Oxi L

Sauerstoff • Oxygen • Oxygène

DE **Kurzanleitung**
Seite 3

GB **Quick Start Guide**
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FR **Manual d´utilisation**
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CN **短手冊**
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ES **Breve manual**
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IT **Manuale breve**
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PT **Manual de curta**
Página 62

NL **Beknopte handleiding**
Pagina 72

www.lovibond.com

CE

EC Declaration of Conformity

Name of the manufacturer: Tintometer GmbH

Schleefstraße 8 - 12
44287 Dortmund
Germany

declares that this product

Product name: **SD 400 Oxi L**

conforms to the following standards which are specified in the Council Directive for the harmonization of legal regulations of the Member States over electromagnetic compatibility (2004/108/EC) and the Low Voltage Directive (2006/95/EC).
For the evaluation of the product in regard to electromagnetic compatibility, the following standards were consulted:

EN 61326-1: 2006 (Table 3, Class B)
EN 61326-1: 2006 (Annex 3, Class B)

This declaration is issued on behalf of the manufacturer by the responsible person,

Dortmund, 20 January 2015

Cay-Peter Voss, Managing Director

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Please refer to the complete version of the Users' Manual. This is located on the micro-SD card within the memory card slot of the instrument.

1. General information

Read this document carefully and familiarize yourself with the operation of the device before using it. Keep this document ready to hand and in the immediate vicinity of the device so that you or technical staff can refer to it at all times in case of doubt.

Assembly, set-up, operation, maintenance and shut-down may only be performed by technically qualified personnel. The technical personnel must carefully read and understand the operating manual prior to beginning all work.

The liability and warranty of the manufacturer for damages and consequential damages are voided in the event of improper use, non-observance of this operating manual, use by insufficiently qualified personnel as well as unauthorized changes to the device.

The manufacturer is not liable for costs or damages arising through the use of this device, especially in the case of improper use or misuse or faults to the connections or the device.

The manufacturer assumes no liability from printing errors.

2. Safety

2.1 Intended use

The SD 400 Oxi L is designed for the measurement of dissolved content of oxygen in water. Suitable oxygen sensors (available in the standard delivery contents of the device) are used for the measurement. The sensor is connected via a 4-pin bayonet connection. The measurement is taken on the sensor membrane at the end of the oxygen sensor.
Due to the type of sensor used, the device must be calibrated regularly to achieve precise measurement values. The sensor must be regenerated or replaced if necessary before performing other measurements.
The safety instructions in this operating manual must be observed (see below).
The device may only be used under the conditions and for the purposes for which it was designed.
The device must be handled with care (do not throw, strike, etc.) and used in accordance with the technical data. It must be protected against soiling.

2.2 Safety instructions

This device is built and tested in accordance with the safety provisions for electronic measurement devices. The fault-free function and operational safety of the device can only be guaranteed if common, general safety precautions as well as the device-specific safety instructions in this operating manual are observed.

1. Function and operational safety of the device can only be adhered to under the climatic conditions specified in the chapter "Technical data".
If the device is transported from a cold environment to a warm environment, a fault of the device function may arise due to the build-up of condensation. In this case, it is necessary to wait until the devices temperature adjusts to the room temperature before use.

2. If it is suspected that the device cannot be used without possibly imposing a danger, it should be turned off immediately and the potential danger be identified before the device is used again. The safety of the user may be diminished by the device if it

- exhibits visible damages.
- no longer works as specified.
- was stored for an extended period in unsuitable conditions.

In case of doubt, send the device to the manufacturer for repair or maintenance.

3. This device is not suitable for safety applications, Emergency Stop equipment or applications in which a malfunction could cause injuries and material damage. If this notice is not observed, severe harm to the health and property damage may occur.

4. This device may not be used in a potentially explosive environment. Operation in a potentially explosive environment causes an increased risk of detonation, fire or explosion as a result of spark formation.

3. Product description

3.1 Delivery contents

- SD 400 Oxi L in carrying case
- 4 (AA) batteries
- Oxygen sensor with storage flask
- Micro SD card with calibration data and operating manual in various languages
- Quick instruction guide

4. Commissioning

4.1 Inserting the batteries

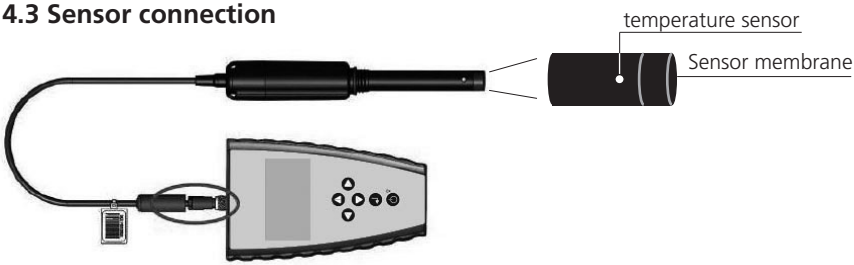
The battery compartment is located on the back side of the SD 400 Oxi L device. To remove the batteries, the battery compartment lid is opened and removed. The 4 AA batteries are inserted according to the polarity. Then the battery compartment lid is replaced and closed completely.

ATTENTION: If the battery indicator in the display blinks, the batteries must be replaced. If the device is operated for an extended time for measurements or the reading of measurement values, we recommend operating the device via an external power source.

4.2 External power supply

A set comprising a Micro USB cable and wall mount is available (optional) for the external power supply. The Micro USB cable can be connected to a PC or to the wall mount and supplies the measuring device with electricity. If an external energy source is used, the battery symbol in the display is replaced with "USB".

4.3 Sensor connection



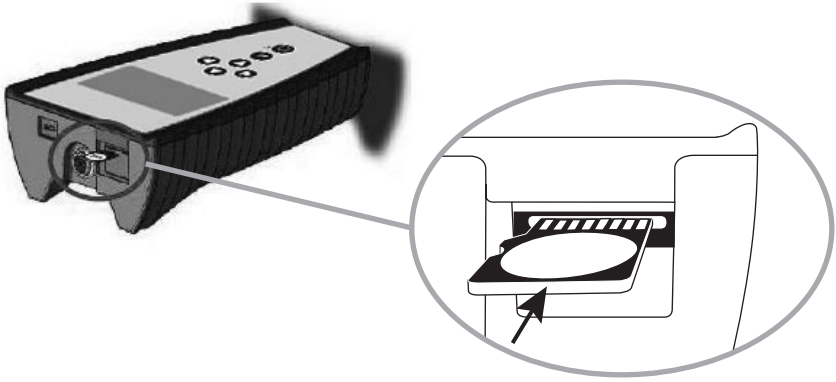
Connecting or removing the sensor on the device:
1. In order to connect the sensor to the measuring device, the sensor connecting plug is connected to the jack on the measuring device and tightened clockwise. Please ensure that the nose and the recess of the polarity reversal safeguard fit together correctly.
2. In order to remove the sensor from the device, the connecting plug is unscrewed anticlockwise and the plug is pulled out of the jack.

4.4 Sensor

The sensor of the SD 400 Oxi L device is an optical oxygen sensor. The sensor is waterproof in accordance with IP67 and is equipped with an integrated temperature sensor. The long-lasting cable is connected to the measuring device by means of a 4-pin plug.
During measurement, it must be ensured that the temperature sensor is also fully immersed in the sample.
During the measurement, it takes a little time for equilibrium to be reached and the dissolved oxygen is diffused through the membrane with the luminophores.
The membrane is sensitive and damages due to scratching, abrasion or from organic solutions (e.g. acetone) falsify measurements.
The sensor must always be kept moist. For this purpose, the storage flask included in the scope of supply is fitted on the sensor and screwed tight (see also 6.2 Safekeeping). It can also be used as a calibration flask.
A Micro SD card also included in the scope of supply contains the sensor-specific calibration data.

The following parts are essential for oxygen measurement with the SD 400 Oxi L device:

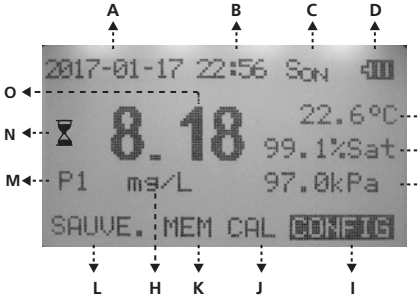
1. Sensor membrane on the tip of the sensor: The optical fluorescence measurement for oxygen measurement takes place at the tip of the sensor membrane.
2. Micro SD card: The relevant data for the sensor is stored on the SD card. If the SD card is inserted in the measuring device, the serial number of the sensor membrane is displayed when switching on. With replacement of the sensor membrane, the SD card is also replaced. It is included in the scope of supply (see the top of the next page).



5. Operation

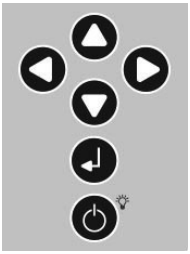
5.1 Display elements

When the measuring device is switched on, it initialises. The serial number of the connected sensor appears in the display during this process. For this purpose, the sensor must be connected and the SD card must be inserted in the measuring device. Then the measuring device is in measuring mode and the following display appears:



A.	Date
B.	Time
C.	Salinity correction On/Off
D.	Battery status
E.	Temperature display in °C or °F
F.	Oxygen saturation in %
G.	Display of the pressure value
H.	Display of the oxygen value in mg/l or ppm
I.	System settings for display A,B,C,E,H and J
J.	Performance of the single-point calibration or calibration settings
K.	Call-up of stored measurement data
L.	Save measurement values
M.	Auto Power-Off: P0: permanently on; P1: 10 minutes after the last button actuation
N.	An hourglass indicates that the calibration is in progress
O.	Oxygen measurement, dissolved

5.2 Controls



On/Off switch, Light On/Off

Confirmation of the entry, press and hold: End measurement/calibration process

In configuration mode or in calibration mode: Adjust display/values (INCREASE/DECREASE)

Cursor movement through the menu or through configuration mode (RIGHT/LEFT)

6 Error messages

Display - Error message	Possible cause	Measure
Micro SD card read error	No SD card in the measuring device, SD card not readable or SD card not inserted correctly in the memory card slot.	Insert the SD card correctly or replace it with a new card in order to check whether the problem pertains to the SD card or the memory card slot.
Sensor communication error	No signals sent from the measuring device	Check the cable connection and connection
Oxygen measurement outside of measuring range	The oxygen concentration is higher than the measuring range of the device	Use suitable measurement samples
Battery symbol blinking	Low battery capacity	Replace batteries or external power supply via USB connection
Single-point calibration error	The calibration time was too long or it was interrupted by pressing and holding the ENTER button	Press any key to continue if the calibration was interrupted by the user or check whether the sensor membrane has exceeded the recommended service life
No display appears when switching on	a) No batteries in the device or incorrectly inserted b) Voltage too low	a) Insert batteries and ensure correct polarity b) Replace batteries and check battery contacts
No response after pressing a button	a) Defective keypad b) Circuit board or software error	Contact retailer
Long response time	a) Sensor cap dirty or defective b) Temperature fluctuations	a) Clean or replace sensor membrane b) Keep temperature constant

Large measurement value fluctuations	a) Temperature fluctuations b) Sensor cap dirty or defective c) Sensor not sufficiently immersed in the sample d) Sensor damaged e) External electronic fault	a) Keep temperature constant b) Clean or replace sensor membrane c) Immerse sensor sufficiently deep in the sample (at least 3 cm) d) Replace sensor e) Switch off or remove external sources of interference

7. Returns

All devices which are sent back to the manufacturer must be free from measurement substance remains and other harmful substances. Measurement substance remains on the housing or on the sensor can endanger persons or the environment.

Use suitable transport packaging for the return of the device, especially if it is still a functioning device. Make sure that the device is protected with sufficient insulating material in the packaging.

8. Disposal

Drop off the depleted batteries at a collection centre designated for this purpose.
The device may not be disposed of with the household waste. If the device should be disposed of, send it directly to us (with sufficient postage paid). We will dispose of the device properly and in an environmentally friendly manner.

9. Technical data

Sensor	Optical (measurement of the luminescence life)
Oxygen, dissolved - Measurement range - Precision - Resolution	 0 – 50 mg/l or 0 – 500 % air saturation 0 – 20 mg/l or 0 – 200 %: ± 1 % of meas. or ±0.1 mg/l (higher value applies) >200 % or >20 mg/l: ± 10 % of meas. 0.1 %, 0.01 mg/l
Temperature - Measurement range - Precision - Resolution	 -5 – 50 °C (storage and operating temperature) ± 0.2 % 0.1 °C
Sensor membrane	Plastic
Dimensions Device Sensor	 approx. 162 x 97 x 50 mm (L x W x H) approx. 287 length, ø 33 mm incl. storage flask
Power supply	4 x AA Alkaline or 5 VDC Micro USB
Cable length	1.5 m, 3 m, 10 m cable length

Connections	4-pin, M9
Device weight	330 g (including batteries)
Data storage	Micro SD card
Reaction time	40 sec. up to 90 % of the measurement value is reached (T-90)
Flow	Not necessary
Salt compensation	Automatic after manual entry
Certificates	CE
Languages	English, German, French, Spanish, Italian, Portuguese, Dutch and Chines (simplified)
Warranty	Device: 4 years, Sensor: 2 years
Sensor	IP 67

10. Accessories / replacement device

Article no.	**Designation**
74 00 60	Electrode with 1.5 m cable
74 00 70	Electrode with 3 m cable
74 00 80	Electrode with 10 m cable
74 00 90	Set with USB cable and wall mount
74 01 00	Set with replacement membrane and Micro SD card
74 01 10	Metal sleeve for protection of the electrode (also sinking weight)
74 01 20	Storage flask
19 76 35	Cleaning cloth

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