

OxyGuard Polaris C Optical

Dissolved Oxygen Meter

Instructions for Use



Content

OxyGuard® Polaris C Optical	3
High performance at low cost	3
Green initiative.....	3
General information.....	3
Key benefits.....	4
Typical applications	4
Technical properties.....	4
Technical specifications.....	5
Overview	6
How to scan a tag.....	7
3. Quick start guide	8
4. Menus	9
1. Calibrate	9
2. Set salinity	10
3. View log	10
4. Tag and log menu	10
4.1. Log mode.....	11
4.2 Registered tags	11
5. Setup.....	13
6. Cobália synchronisation	15
How to log data	15
How to transfer data to Cobália	16
Software updating of your Polaris C using the Cobália app.	16
7. Status list	16
5. Maintenance	17
Replacement and Renovation of the Sensor Spot	17
Battery replacement	18
Factory reset of Polaris C.....	18

OxyGuard® Polaris C Optical

High performance at low cost

The Polaris C is a high-performance, low-cost and almost maintenance-free meter for measuring oxygen and temperature. As all OxyGuard products, the Polaris C instrument is produced in Denmark and based on the most reliable available technology. It is our goal to produce sturdy, long-lasting and state-of-the-art equipment which is suitable for the, sometimes, harsh conditions our customers face. We also strive to make equipment that can be easily repaired by OxyGuard distributors around the world, making our products reliable tools for your production.

The Polaris C Optical meets all these criteria and with this meter you get the high quality associated with OxyGuard technology and a product that will serve you well for many years. OxyGuard was founded as the first company in the world dedicated to providing monitoring solutions for fish farms. The OxyGuard probes, meters and multichannel systems were revolutionary and helped fish farming grow into the industry it is today.

Green initiative

Electronic waste (E-waste) is a big and growing problem worldwide. In 2014, 40 million metric tons of discarded electronic goods were generated and the amount increases every year. Only 20% of all electronic devices are properly recycled while part of the remaining 80% are likely to end up in landfills causing tremendous harm to the environment. Therefore, OxyGuard takes measures to ensure that our products are not becoming part of this problem. We offer a discount on new equipment if old products are returned and we encourage our customers to send used or broken products back to us for recycling. All returned units are carefully recycled or re-used.

General information

Polaris C Optical automatically compensates for temperature and barometric pressure. It can store more than 3000 complete sets of data, including time and date stamps. The logged data can be stored either manually or automatically and in intervals, with the possibility to relate the data to areas or spots by using NFC tags. The stored data can be easily transferred to Cobália via

Bluetooth on your smartphone or PC. The meter is fully field serviceable and the instrument can withstand short-term submersion. The meter is easy to use: To measure simply turn the Polaris on and immerse the probe in the water and you are ready for your first measurement. In still water, move the probe for 5 to 10 seconds. For accurate measurements, calibrate your meter and set the suitable value for salinity (see the instructions below). When not in use, keep the Polaris in the storage pouch in a place with moderate and stable temperatures.

Key benefits

- High accuracy
- Easy-to-do calibration
- Automatic check of the hardware
- Automatic compensation for barometric pressure and temperature
- Water resistance
- Automatic or manual data logging of 3000+ full sets of data
- Low power consumption, up to 250 days of normal use with a single AA LR6 battery
- Immediate response time
- Variable display options and unit use
- automatically temperature compensated optical probe
- Long-term stability

Typical applications

- Aquaculture
- Rivers and lakes
- Hydroponics
- Wastewater treatment

Technical properties

Polaris C Optical uses the most reliable technology on the market. The probe is an optical oxygen sensor based on luminescence quenching of a sensor dye. The dye is excited with a modulated light and the luminescence lifetime of the dye measures as a phase shift. The luminescence of the dye is quenched by oxygen thus the more oxygen the shorter the lifetime. The technology is state of the art and to ensure a long lifetime of the sensor spot, it is excited with near infrared (NIR) light. This minimizes bleaching of the dye.

Technical specifications

Units of measurement: Oxygen: ppm (mg/L), % saturation. Temperature: degrees Celsius (°C), degrees Fahrenheit (°F)

Display: Graphical LCD display with variable backlight

Probe type: LDO Luminescence optical technology

Cable length: Standard 3 m. Available at any length up to 50 meters by request

Operating temperature:

Probe: -10 to +60 °C and +14 to +140 °F.

Meter: -20 to +60 (°C and -4 to 140 °F

Waterproof: The meter is short term immersion proof to 5m depth

Response time: To 90% in less than 15 seconds in water (less than 5 sec in air)

Measuring range:

Oxygen: 0-25 mg/L and 0-250 % saturation.

Temperature: -10 to +60 °C and +14 to +140 °F

Measuring accuracy: Oxygen: ± 1% sat, ± 0.1 ppm (mg/l). ± 0.5 °C or °F

Data logging capacity: 3000+ sets of data with up to 99 data groups

Salinity compensation range: 0-99 ppt salinity. Manually set

Automatic check of: Probe function, meter function, cable and battery

Automatic compensation: Temperature and barometric pressure (0-7000 m a.s.l)

Dimensions

Meter: Length = 98 mm, diameter = 36 mm (Length: 3.86 in, diameter: 1.42 in)

Probe: Length = 50 mm, diameter = 47.5 mm (1.97 in, 1.87 in)

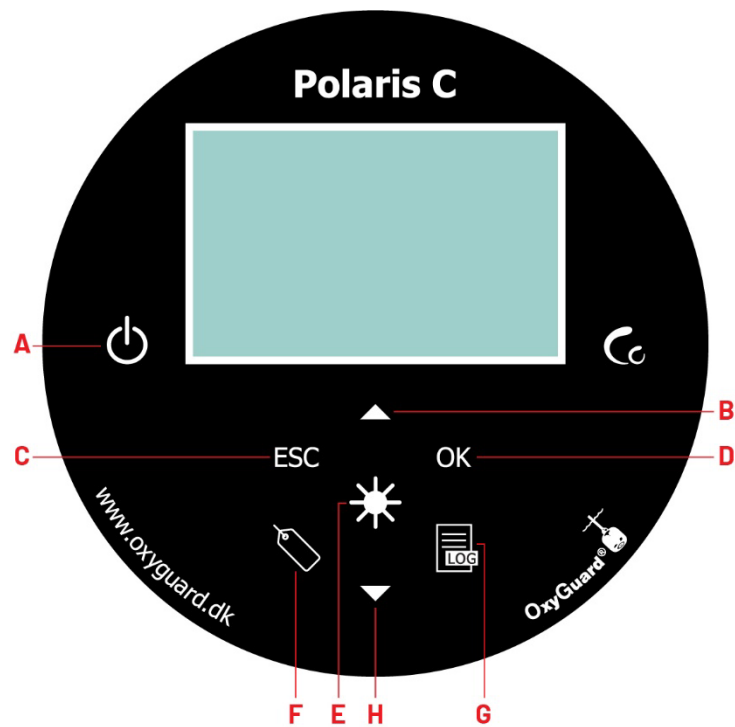
Power: 1 AA alkaline batteries

Battery life: 150 hours continuous use depending on settings and battery quality

Standard accessories: Tool, storage pouch

Lifetime (minimum): Sensor spot: 2 years.

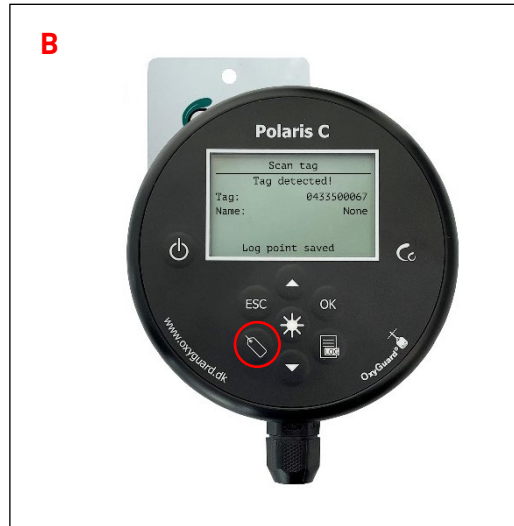
Overview



- A. ON/OFF button. Turn the instrument on or off by pressing the button for approx. 3 seconds.
- B. Up arrow button. Changes the highlighted measurement on the screen. Changes selection in the menus.
- C. ESC button. Exits menus.
- D. OK button. Enters the menu from the main screen.
- E. Light button. Turns on the light on the display.
- F. Tag button. Depending on the setup, reads a tag or stores a sample in the data log.
- G. Log button. Opens the "View log menu".
- H. Down arrow button. Changes the highlighted measurement on the screen. Changes selection in the menus.

How to scan a tag

To scan a tag (A), place the Polaris C on top of the tag (B) and press the "Tag" button for a few seconds until the message "Tag detected" appears on the screen.



3. Quick start guide

1. Turn on your Polaris C by pressing the ON/OFF button for 3 seconds.
2. Use the down arrow button to select the parameter you want to see in large figures.
3. To set the salinity, press the OK button. The meter will display the menu:
 - Calibrate
 - Set salinity
 - View log
 - Tag and log menu
 - Setup
 - Cobália sync.
 - Status list
4. Use the arrow buttons to choose "Set salinity" and press OK.
5. Use the arrow buttons again to set the correct value. First, you select the value for the first digit. Then press OK and the cursor moves so that you can set the second digit.
6. Press ESC to exit the menu.
7. Your device is ready to measure.
8. To log a data point, press the TAG button (see section 4).

4. Menus

Turn the meter on by pressing the ON/OFF button for 3 seconds. The meter has the following menus:

1. Calibrate
2. Set salinity
3. View log
4. Tag and log menu
 - 4.1. Log mode
 - 4.2. Registered tags
 - 4.2.1. Delete tag
 - 4.2.2. Choose Tag ID (this only appears if the log mode "Personal" has been chosen)
 - 4.3. Delete all tags
 - 4.4. Scan tag (this only appears if the log mode "Personal" has been chosen)
 - 4.5. Log interval
 - 4.6. Log status
5. Setup
 - 5.1. User interface
 - 5.1.1. Language
 - 5.1.2. Date/Time settings
 - 5.1.2.1. Set date & time
 - 5.1.2.2. Time format
 - 5.1.2.3. Date format
 - 5.1.3. Temperature unit
 - 5.1.4. Oxygen unit
 - 5.1.5. Auto shutdown
 - 5.1.6. Light intensity
 - 5.1.7. Light timer
 - 5.2. Calib. precision
 - 5.3. Information
6. Cobália sync.
7. Status list (this only appears if there is an error message)

1. Calibrate

Turn the Polaris C on by pressing the ON/OFF button for 3 seconds. On the start screen, a reading from 97 to 103% oxygen saturation (in air) should appear. Small deviations could be due to changes in humidity. If the deviations are big, try to dry the sensor spot. If this does not help, make a calibration as described below. To make an accurate calibration, conditions must be stable. If they are not, the meter will display an error message stating what the problem is.

1. Turn your Polaris C on by pressing the ON/OFF button for 3 seconds.
2. Press the OK button. The meter will display the menu:
 - Calibrate
 - Set salinity
 - View log
 - Log mode
 - Setup
 - Cobália sync.
3. Use the arrow button to choose "Calibrate".
4. Press OK again to accept the calibration.

For information about how to change the calibration precision, see the setup guide for user interface (see section 0).

2. Set salinity

To make accurate measurements you must know the salinity of your media. Set the salinity to suit the salinity of your media as described below.

1. Turn your Polaris C on by pressing the ON/OFF button for 3 seconds.
2. Press the OK button. The meter will display the menu:
Calibrate
Set salinity
View log
Tag and Log menu
Setup
Cobália sync.
3. Use the arrow button to choose "Set salinity". Press the OK button to change the setting.
4. Use the arrow buttons again to set the correct value. To move from one digit to the next, use the OK button.
5. Press ESC to exit the menu.

3. View log

You can review your logged data in a data table directly on the display.

1. Turn your Polaris on by pressing the ON/OFF button for 3 seconds.
2. Press the OK button. The meter will display the menu:
Calibrate
Set salinity
View log
Tag and log menu
Setup
Cobália sync.
3. Use the arrow button to choose "View Log". Press the OK button to proceed.
4. If more than one tag has been used for logging, you will be asked to choose the tag you wish to see. After selecting a tag, press the OK button. If only one tag has been used, the data table is shown directly.
5. The newest values are shown first. The first line shows the date the logs were made. To see earlier log points, use the down arrow button.
6. By pressing OK, you can change the measurement value unit.
7. Press ESC to exit the menu
8. You can view the latest logged data by simply pressing the View log button. This can be used to check recently logged data and to confirm that the data should be logged.

4. Tag and log menu

In the "Tag and log menu", you can change the settings and see information on tags and logs.

1. Press the OK button and the meter will display the following menus:

Calibrate
Set salinity
View log
Tag and log menu
Setup
Cobália sync.

2. Use the arrow button to select the "Tag and log menu"
3. Press OK and the meter will display the menus:

- Log mode
- Registered tags
- Delete all tags
- Log interval
- Log status

See sections below for information about individual tags and log menus.

4.1. Log mode

There are several log modes. To change the log mode, go to the "Tag and log menu" as described above.

1. Use the arrow buttons to choose the "Tag and log menu".
2. Press the OK button. The meter will display the following menus:

- Log mode
- Registered tags
- Delete all tags
- Log interval
- Log status

4. Use the arrow buttons to choose the "Log mode". Press the OK button and the meter will display the following menus:

- Personal** - All log points are stored on the same Cobália tag.

- Tag** - A Cobália tag must be selected for every log point.

- Tag Interval** - Stores a log point automatically at a set interval (of 10 or more seconds).

See section 4 for details on the logging features.

4.2 Registered tags

4.2.1 Delete tag

In this menu, you can see your tags and delete specific tags. All the registered tags will be displayed with a "Tag name" or a "Tag ID". To get information on a tag, select it with the cursor and press OK.

1. Go to the "Tag and log menu" as described in section 4.
2. Use one of the arrow buttons to choose "Registered tags" and press OK. The meter will display the logged tags. Use the arrow keys to select a tag. Press OK. The meter will display the following menu:

- Back
- Delete tag
- Choose tag

3. Choose "Delete tag" and press OK. The following options will appear:

- Abort
- Yes

4. If you choose "Yes", your tags will be deleted.

4.2.2 Choose Tag ID (only in "personal mode")

1. Go to the "Tag and log" menu as described in section 4.

2. Use the arrow buttons to choose "Registered tags" and press OK. The meter will display the logged tags.

4.3 Delete all tags

In this menu, all registered tags can be deleted simultaneously.

1. Go to the "Tag and log menu" as described in section 4. The following menu will appear:

Log mode
Registered tags
Delete all tags
Log interval
Log status

2. Use the arrow buttons to choose "Delete all tags" and press OK to proceed.

To ensure that no tags are deleted accidentally, you will be asked to confirm. Use one of the arrow keys to choose "Yes" to delete all tags.

4.4 Scan a tag

From this menu, you can scan a tag without saving a log point. This menu will only be visible when the instrument is in "Personal log mode".

1. Go to the "Tag and log menu" (see section 0). The following menu will appear:

Log mode
Registered tags
Delete all tags
Log interval
Log status

2. Use the arrow buttons to choose "Scan tag". The following menu will appear:

Detecting tag

3. Now your Polaris is ready to scan a tag. Place the tag card on the backside of the Polaris C (see section 2, "How to scan a tag"). When the tag card is scanned, the meter will display the message "Tag detected".

4. If your Polaris C do not detect at tag card within 10 seconds, it will display the message "No tag detected".

4.5 Log Interval

You can set your meter to log continuously for a period of time.

1. Go to the "Tag and log menu" (see section 4).
2. Use the arrow keys to choose "Log interval" and press OK.
3. Set your preferred log interval (of 10 or more seconds).
4. Press ESC to exit the menu.

4.6 Log status

You can get a summary of the logging status and settings, including current logging interval in seconds, and you can see the space left in the log in percentage of full capacity. To see this:

1. Go to the "Tag and log menu" (see section 4).
2. Use one of the arrow keys to choose "Log status" and press OK.

5. Setup

5.1 User interface

To set up the user interface, complete the following steps:

1. Turn your Polaris on by pressing the ON/OFF button for 3 seconds.
2. Press OK and the meter will display the menu:
 - Calibrate
 - Set salinity
 - View log
 - Tag and log menu
 - Setup
 - Cobália sync.
3. Use the arrow buttons to choose "Setup".
4. Press the OK button and the meter will display the menu:
 - User interface
 - Calib. precision
 - Information
5. Use one of the arrow buttons to choose "User interface" and press OK. The meter will display the following menus:
 - Language
 - Date/Time settings
 - Temperature unit
 - Oxygen unit
 - Auto shutdown
 - Light intensity
 - Light timer
6. Use the arrow buttons to choose the parameter you wish to see. Below you will find information about the individual submenus.

5.1.1 Language

This menu is only available for the multilingual version of the Polaris C.

1. Go to the "User Interface" menu (see section 5.1).
2. Use the arrow buttons to choose "Language". Press the OK button.
3. Use the arrow buttons to choose your preferred language. Press OK.
4. Press ESC to exit the menu.

5.1.2 Date/Time settings

Date and time setup are important for the data log functions. Make sure it is correct.

1. Go to the "User Interface" menu (see section 5.1).
2. Use the arrow buttons to choose "Set date & time". Press the OK button. The meter will display the menu:
 - Set date & time
 - Time format (There are two time formats available, 12h and 24h hour format)
 - Date format (there are three date formats available)
3. Use the arrow buttons to choose "Set date & time". Press OK.
4. Use the arrow buttons to set the values of year (YYYY), month (MM) and day (DD). To move from one value to the next, use the OK button.
5. Use the arrow buttons to set the values of the current hour (hh), minutes (mm) and am/pm (for 12h time format). To move from one value to the next, use the OK button.
6. Use the arrow buttons to set the GMT time zone. Press OK to select the correct time zone.
7. Press ESC to exit the menu.

5.1.3 Temperature unit

You can choose between degrees Celsius (°C) and degrees Fahrenheit (°F).

1. Go to the "User interface" menu (see section 5.1).
2. Use the arrow buttons to choose "Temperature unit". Press OK.
3. Use the arrow buttons to choose your preferred unit for temperature.
4. Press ESC to exit the menu.

5.1.4 Oxygen unit

You can choose between ppm and mg/L. The meter will always display oxygen in % saturation also.

1. Go to the "User interface" menu (see section 5.1).
2. Use the arrow buttons to choose "Oxygen unit". Press OK.
3. Use the arrow buttons to choose your preferred unit for temperature.
4. Press ESC to exit the menu.

5.1.5 Auto shutdown

The meter has an auto shutdown function for power saving purposes. You can set the time for auto shutdown. If no button has been pressed for a chosen period of time, the meter will shut down.

1. Go to the "User interface" menu (see section 5.1).
2. Use the arrow buttons to choose "Auto shutdown". Press the OK button.
3. Use the arrow buttons to choose your preferred time (in minutes) for automatic shutdown or turn the auto shutdown off.
4. Press ESC to exit the menu.

5.1.6 Light intensity

You can choose between "Low" (factory setting), "Medium" and "High". The light setting will affect the battery life.

1. Go to the "User interface" menu (see section 5.1)
2. Use the arrow buttons to choose "Light intensity". Press the OK button.
3. Use the arrow buttons to choose your preferred light intensity and press OK.
4. Press ESC to exit the menu.

5.1.7 Light timer

To improve battery lifetime, you can set a timer that turns the light off automatically. The light can also be turned off manually by pressing the light button on the meter.

1. Go to the "User interface" menu (see section 5.1).
2. Use the arrow buttons to choose "Light timer". Press the OK button.
3. Use the arrow buttons to choose your preferred light intensity and press OK.
4. Press ESC to exit the menu.

5.2 Calibration precision

The three settings for calibration are "Normal", "High" and "Field". "Normal" is the factory setting and ensures very precise measurements. "High" is the most sensitive, "High" needs very stable conditions indeed. Ambient temperature for "Normal" and "High" should be in the range between 10° and 30°C.

"Field" is the least sensitive. If conditions are stable, "Field" can give just as accurate a calibration as "Normal" or "High". Ambient temperature for "Field" should be in the range between 1° and 40°C.

If these temperatures are not observed, it is not possible to make a calibration.

We recommend that you leave the Polaris in its pouch overnight in stable conditions and calibrate it in the morning in the pouch without moving it. **Be aware of setting the calibration precision to suit your location.**

1. Go to the "Setup" menu (see section 5):
[User interface](#)
[Calib. precision](#)
[Information](#)
2. Use the arrow buttons to choose "Calib. precision". Press the OK button.
3. Use the arrow button to choose your preferred calibration setting and press OK.
4. Press ESC to exit the menu.

5.3 Information

In the "Setup" menu (see section 5), you can choose "Information" to see the software version and the serial number of your instrument.

6. Cobália synchronisation

To view the logged data on a PC or smartphone the data must be transferred to Cobália via Bluetooth. For correct visualisation in Cobália, it is very important that date and time are correctly set up (see section 5.1.2).

All log points are associated with a tag. This makes it possible to group multiple log points for a single physical position (e.g. a fish tank, pond, etc.) or even log points related to an employee ID. The tags are physical cards in the size of a credit card that can be attached to tanks, ponds, etc. The tag can be scanned using the Polaris C or it can be selected in the menu of the meter before a log point is stored. To make navigation on Polaris C easier, the tags can be named in Cobália. **Only tags registered in Cobália can be used.** Others will be rejected.

When logged data have been synchronized in Cobália, the tag information is used to link the log points to positions in the system (e.g. a specific tank).

Polaris C comes with one tag and if needed, it is possible to buy additional tags.

Please see section 6 and 7 for instructions on data transfer and synchronisation with Cobália.

How to log data

To start the logging process, press the TAG button. As described below, there are three different log modes.

- When using the "Personal" log mode (factory setting), the measurement is instantly stored in the data log and a message "Log point saved" is shown on the display. The log points must be associated with a tag, and therefore a tag must be scanned or selected from the tag list the first time a log mode is used. Likewise, if the log mode is changed to "Personal" mode, a tag must be scanned/selected before the next logging is made.
- When using the "Tag" log mode, the display shows a list of possible tags while the meter scans for a tag. If a tag is detected or selected from the tag list, the measurement is stored in the data log and the message "Log point saved" appears on the display.
- When using the "Tag Interval" log mode, the meter expects an identification tag. Using this mode the instrument continues to log measurements at a set interval until this is stopped by pressing the TAG button again. The interval can be adjusted in the setup.

For information on how to change the log mode, see section 4.

For information on how to change the log settings, see section 4.

How to transfer data to Cobália

To transfer the data log to Cobália, you need a smartphone with the Cobália app installed (see the Application note). Go to "Cobália Sync." on your Polaris C.

1. Turn your Polaris on by pressing the ON/OFF button for 3 seconds.
2. Press OK and the meter will display the following menu:
 - Calibrate
 - Set salinity
 - View log
 - Log and tag menu
 - Setup
 - Cobália sync.
3. Use the arrow buttons to choose "Cobália Sync". Press the OK button to proceed.

Bluetooth will be activated automatically, and the address of the meter is shown on the display. The address can be used to distinguish multiple meters from each other in the transfer procedure.

The meter will become visible in the Cobália app on your smartphone and the transfer process will begin. When using the logging features in Polaris C, the data will be transferred to Cobália regularly.

Software updating of your Polaris C using the Cobália app.

You can update the software of your Polaris C using the Cobália Sync. app if you have registered your meter in Cobália.

To update your Polaris C through Cobália, you need to go through the following steps:

1. Open your Cobália Sync. app on your phone
2. Log in with your username and password
3. Turn on your Polaris C and select the Cobália Sync. app from the menu
4. The Cobália Sync. app on your phone will automatically scan for devices in Cobália via Bluetooth (make sure to enable Bluetooth on your phone)
5. The Cobália Sync. app will display a list of scanned devices on your phone
6. Choose the Polaris C you wish to update from the list of scanned devices by clicking it
7. NOTE: Only devices that upload data to Cobália can have their software updated via the Cobália Sync. app.
8. If there is new software for the specific Polaris C, the app will automatically go to an update window and ask if you wish to update your meter.
9. If you wish to update your meter, choose "yes"

7. Status list

The status list only appears if there is an error message. Press OK to see a list of error conditions. To get more information, use the arrow buttons to select the problem you wish to explore and press OK.

5. Maintenance

Replacement and Renovation of the Sensor Spot

The probe sensor spot should be wiped clean from time to time. Sensor spot replacement should not be performed unless:

- the sensor spot is damaged or
- you cannot calibrate to the correct value after long use (some years).

STEP 1

Remove the probe from the water, rinse it, dry it and un-screw the cap. If it is stuck, tap the side of the probe gently with a hammer, then try again.

STEP 2



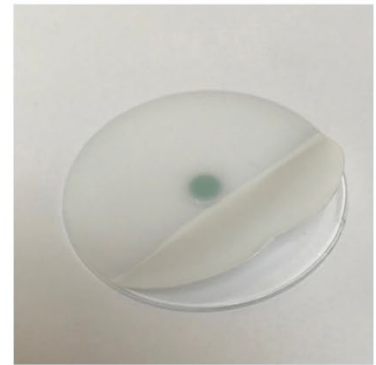
Place the reinforcement grid inside the probe cap.

STEP 3



Place the O-ring in the recess on the top of the probe body.

STEP



Remove the white foil from the disc.

STEP 5



Place the disc on top of the probe body with the **green** spot facing down (the black-up). Do not touch the spot on any side with your fingers.

STEP



The disc is centered on top of the probe body. Put the probe cap over the disc.

STEP 7



Screw the probe cap and body carefully together.

Tighten the cap hard.

IMPORTANT: After renovation, the probe can be regarded as new. It is now ready for calibration in air.

Battery replacement

Use the tool to unscrew the rear plate. Carefully slide the Battery Lock to the right-hand side (see below picture). Then gently lift the battery from the left-hand side of the battery holder (see picture). Place the replacement battery in the battery holder and slide the Battery Lock back to its original position (in the middle).

Tighten the rear plate properly and make sure that the inside of the meter does not get wet!

*Please note that the Battery Lock was introduced on 1st of June 2023. Instruments purchased before that date do therefore not have a Battery Lock fitted.



Factory reset of Polaris C

If your Polaris C gives repeated error messages such as a "DO sensor error" it is necessary to reset the meter. This error message is (often) caused by an unsuccessful calibration. You can do a factory reset to remove the error message.

To do a factory reset you need to go through the following steps:

1. Turn on your Polaris C
2. Press the OK button to open the menu
3. Press the up and down arrows at the same time and keep them down for 2 to 4 seconds to open the "Technical Setup" menu
4. Use the down arrow to choose "Load default values"
5. Press OK
6. Confirm by pressing OK again

Your Polaris C is now reset to its factory settings, which includes the reset of any custom settings of the salinity and temperature. After a factory reset you should redo the calibration.

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Data subject to change without notice

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