



**STARTER 300D
Portable DO Meter
Instruction Manual**

**Manual de instrucciones
Del medidor de OD portátil
STARTER 300D**


**STARTER 300D
Appareil de mesure portable de
l'oxygène dissous (OD)
Manuel d'instructions**

**STARTER 300D
Medidor Portátil de OD
Manual de Instruções**

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1 INTRODUCTION

 Thank you for choosing OHAUS. Please read the manual completely before using the **STARTER 300D** portable DO (Dissolved Oxygen) meter to avoid incorrect operation.

The STARTER 300D has an excellent performance/price ratio and is designed with many useful features. Other accessories are also available from OHAUS.

Starter 300D offers many practical features such as:

- Ergonomic, multifunctional design for ambidextrous measurements or bench top use
- Salinity and barometric pressure compensation
- IP54 protection against dust and water
- Ohaus' renowned user friendly software

1.1 Definition of Signal Warnings and Symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

Signal Words

WARNING	For a hazardous situation with medium risk, possibly resulting in injuries or death if not avoided.
CAUTION	For a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or injuries if not avoided.
Attention	For important information about the product.
Note	For useful information about the product

Warning Symbols



General hazard



Explosion hazard



Corrosive hazard



Alternating current



Direct current

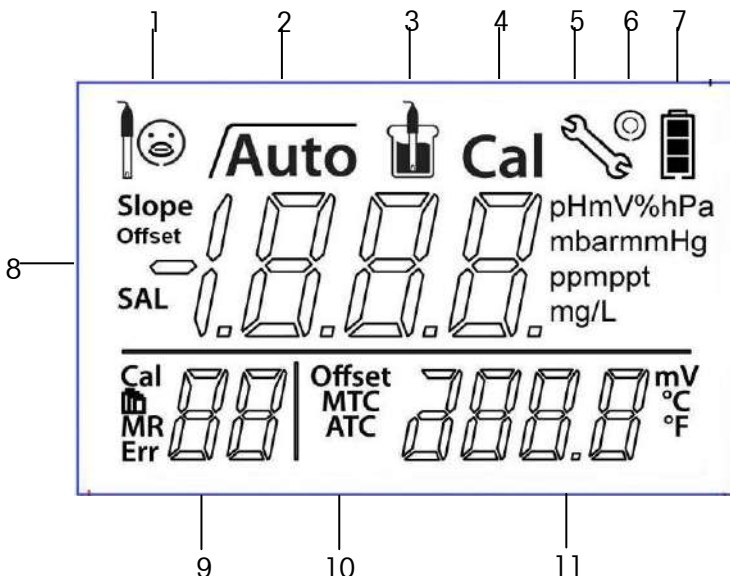
1.2 Safety Precautions

CAUTION: Read all safety warnings before installing, making connections, or servicing this equipment. Failure to comply with these warnings could result in personal injury and/or property damage. Retain all instructions for future reference.

- Use the equipment only in dry locations.
- Dry off any liquid spills immediately. The instrument is not watertight.
- When using chemicals and solvents, comply with the instructions of the chemical producer and the general lab safety rules.
- Use only approved accessories and peripherals.
- Operate the equipment only under ambient conditions specified in these instructions.
- Do not operate the equipment in hazardous or unstable environments.
- Service should only be performed by authorized personnel.

1.3 Display and controls

Displays



1 Electrode condition




Slope: 80-125%


Electrode condition is very good



Slope: 60-80%


Electrode condition is not so good, needs attention or cleaning

2  displays when manual endpoint, need to press button-**Read** to lock the reading, **/Auto** means auto endpoint mode, meter judges the endpoint(reading is stable) and locks the reading **automatically**.

3 Measurement icon -  measurement or calibration is running

4 Calibration icon - **Cal** calibration in progress

5 Setup icon -  instrument is in the setup mode

6 Power always on icon -  Meter will not automatically turn off after 10 minutes no operation (see 4.4)

7 Battery status icon - fully charged, half-charged or fully discharged










8 ppm, mg/L or % for DO reading or calibration; mbar, hPa or mmHg for pressure entry; ppt for salinity entry

9 Calibration point **Cal** ; Memory number **MR**; Error index **Err**

10 Auto Temperature Compensation (ATC); Manual Temperature Compensation (MTC)

11 Temperature during measurement or **Offset** in calibration process

Controls

Button	Press & release 	Press & hold for 3 seconds 
	<ul style="list-style-type: none"> - Start or endpoint measurement (manual endpoint mode) - Confirm setting, confirm entered value for setting 	<ul style="list-style-type: none"> - switch between auto endpoint and manual endpoint mode 
	<ul style="list-style-type: none"> - Start calibration 	<ul style="list-style-type: none"> - Review the latest calibration data
	<ul style="list-style-type: none"> - Meter turn on - Back to measurement screen 	<ul style="list-style-type: none"> - Meter turn off
	<ul style="list-style-type: none"> - Store current reading to memory - Increase value during setting - Scroll up through the memory 	<ul style="list-style-type: none"> - Recall stored data
	<ul style="list-style-type: none"> - Switch between ppm, mg/L and % measuring modes - Decrease value during setting - Scroll down through the memory 	<ul style="list-style-type: none"> - Enter setup
		<ul style="list-style-type: none"> - Start self-diagnosis

2 INSTALLATION

Carefully unpack the box.

2.1 Package contents

The ST300D-B (Basic) package has the following items:

ST300D-B	Units
STARTER 300D meter	1
AAA battery	4
Electrode Clip	1
IP54 cover caps	1 set
Wrist Strap	1

In addition to ST300D-B package content, the ST300D package also includes:

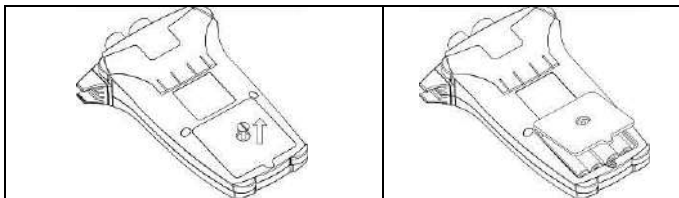
STDO11 (DO electrode with 1.0m cable)	1
STTEMP30 (temperature sensor)	1

Accessories:

Model	Description	P/N
STDO11	Galvanic DO electrode	30031639
STTEMP30	Temperature Electrode	83033970

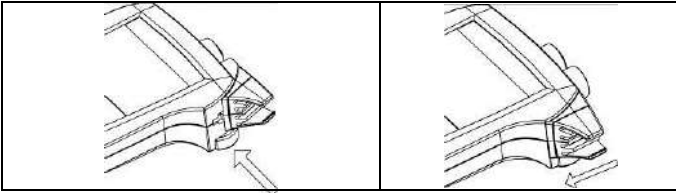
DO Zero Oxygen Chemical	30059257
Wrist strap for portable meters	83032963
Clip Electrode for portable meters	83032964
Portable Bag for portable meters	30031635

2.2 Installing the batteries



- Remove the battery cover screw using a coin or screwdriver and remove the battery cover
- Insert the batteries in the battery compartment as shown
- Replace the battery cover and tighten the battery cover screw

2.3 Installing the electrode clip

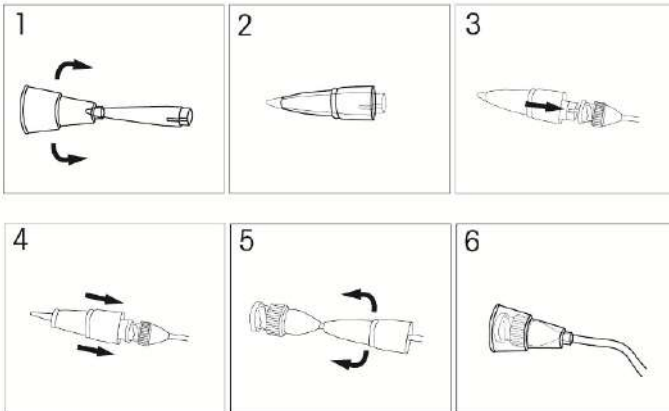


The electrode clip is an electrode holder that can be placed next to the display on either side of the housing.

- Attach the clip by inserting the tabs into the recess.
- Slide the clip forward to lock in position. Slide the shaft of the sensor into the clip from above.

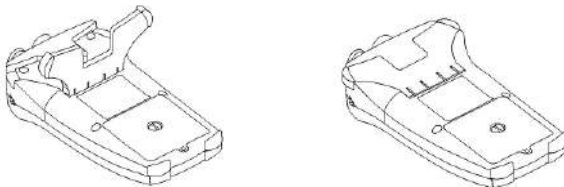
2.4 Installing the IP54 cover caps

Use the small plastic tool as shown:



2.5 Integrated stand for table top use

Starter 300D has an integrated table stand as shown, which can be pushed out to use the meter on a lab bench or desk. To close the stand, push the middle edge of the stand toward the meter.










3 SETUP

3.1 Setting barometric pressure

For calibration and measurements, the actual barometric pressure is very important, since it influences the dissolved oxygen value. Be sure to enter the **CORRECT** barometric pressure before measurement and calibration.





3.1.1 Setting the barometric pressure unit

The meter can display the following units: **mbar** (milibar), **hPa** (hectopascal) and **mmHg** (millimeter mercury).

- Power the meter on by pressing 
- Press and hold button-  for 3 seconds until setup icon  appears on the display. The current unit of barometric pressure displays.
- Press button-  or button-  to choose the unit you want.
- Press button-  to confirm your selection or  to return to the measurement screen.

3.1.2 Setting the barometric pressure value





After the setting of barometric pressure unit, the value of barometric pressure displays.

- Press button-  or button-  to adjust the value.
- Press button-  to confirm your selection or press button-  to return to the measurement screen.

3.2 Setting salinity value

Since salinity has an influence on the dissolved oxygen value, it is important to enter the correct salinity value. The meter can compensate salinity for measurements in solutions with salinity from 0 to 50 ppt. The default value for salinity is 0.0 ppt, which can be changed by the following procedure:

After the setting of barometric pressure value, the salinity value is displayed.

- Press button-  or button-  to adjust the salinity value.
- Press button-  to confirm the value or press button-  to return to the measurement screen.





Normally seawater salinity is 35ppt, which means 35g of salt per 1000g seawater.

3.3 Setting MTC value

Please note: If a separate or built-in temperature electrode is used, the meter will enter Automatic Temperature Compensation (ATC) mode. If the meter does not detect a temperature electrode, it automatically switches to the Manual Temperature Compensation mode and **MTC** appears. MTC temperature value should be set. (see 3.3.2)

3.3.1 Setting the temperature unit





After confirming the salinity value, the temperature unit appears on the display.

- Press button-  or button-  to switch between °C and °F.
- Press button-  to confirm the temperature unit you select or press  to go back to the measurement screen.

Note: °C = 5/9 (°F -32)

3.3.2 Setting the MTC temperature value




After confirming the temperature unit, the MTC temperature value appears on the display. .

- Press button-  or button-  to adjust the temperature value.
- Press button-  to confirm the setting or press button-  to return to measurement screen.


The default setting is 25 °C (77°F).

3.4 Setting the 'Meter Always Working' mode

After confirming the compensation temperature value, the meter enters the meter always working mode setting

- Press button-  or button-  to select "ON" or "OFF".
- Press button-  to confirm

Default setting is Meter always working mode is turned off. (select "OFF"), which means the meter will turn off the power without any press operation after 10 minutes. So you can save the battery life.

When the icon  displays (select "ON"), it means the meter is always working and will NOT automatically shut itself off after 10 minutes of no press operation.

4 STARTER 300D OPERATION



WARNING Do not operate the equipment in hazardous environments. The equipment is not explosion protected.



WARNING When using chemicals and solvents, comply with the instructions of the chemical producer and the general lab safety rules.

4.1 Calibration

4.1.1 Zero-oxygen solution




The STARTER 300D allows you to perform 1-point or 2-point calibrations; normally a 1-point calibration is enough. The 2-point calibration which is rarely performed must be run in a zero-oxygen solution.

Preparing a zero-oxygen solution: put approximately 20ml of pure or deionized water into the bottle of DO Zero Oxygen Chemical (30059257, there are about 5g powder in it), stir for at least 5 minutes. The solution is now prepared.

4.1.2 Performing 1-point calibration

When performing calibration, Ohaus recommends using Auto End Point Mode. After powering the meter on, be sure the top of the screen shows $\sqrt{\text{Auto}}$ to ensure the meter is in Auto End point Mode.







Auto or Manual End point Mode:

- Press and hold  to change the **End Point Mode**.
- When in Manual Mode, to manually reach a pH measurement or calibration value, you need to press button-  when reading is stable and displays $\sqrt{\text{---}}$: then the sample reading or calibration value freezes, $\sqrt{\text{---}}$ blinks 3 times and freezes on the display.
- When in Auto End Point Mode, the meter determines when the reading is stable then displays and locks the reading or calibration value automatically, the reading freezes and  blinks 3 times then disappears; $\sqrt{\text{Auto}}$ blinks 3 times and freezes on the display.

Before performing calibration, you must enter the **correct** barometric pressure in the meter (see 3.1). Please keep in mind the variation of barometric pressure depending on location, altitude,





etc... An incorrect barometric pressure may negatively impact the calibration procedure and thus affect the accuracy of your measurement.

Normally the DO electrode will only need to perform a 1 point calibration in the air (or Oxygen-saturated water). Before calibration you need to rinse the DO electrode with pure water and carefully wipe the water off with a tissue.



- Place the electrode in the air.
- Press button-  The calibration icon **Cal** and the measurement icon  appear on the display.  is blinking during calibration.
- The meter reaches endpoints according to the Endpoint Mode, 100% will display.
- Once you have completed your 1-point calibration, you have 3 options:
- Press button-  to finish 1-point calibration, slope and offset are shown on the display then return to measurement screen.
- Press button-  to reject calibration and return to measurement screen.
- Press button-  to complete a 2-point calibration (after preparing the zero oxygen solution).


4.1.3 Performing 2-point calibration

- Perform the 1-point calibration as described above in "**Performing 1-point calibration**".


Place the electrode in the zero oxygen solution and press button-  The measurement icon  appears on the display. The icon  is blinking during the calibration measurement. The meter reaches the endpoint according to the preselected endpoint mode (Auto endpoint mode will arrive endpoint automatically while manual endpoint requires pressing button- ).

You now have 2 options:

- ❖ Press button-  to finish the 2-point calibration, slope and offset are shown on the display then return to measurement screen.
- ❖ Press button-  to reject calibration and return to measurement screen.

Pressing and holding button-  will display the last calibrate data when in measurement screen.


4.2 Sample measurement



Dissolved oxygen readings can display unit of ppm, mg/L or %. You have the option of choosing the unit according your application by pressing button-  when on the measurement screen.

When measuring the sample, please note:

- The sample must be **stirred**
- Be sure the minimum water flow rate is **5 cm/second** across the electrode membrane.

Then

- Place the DO electrode in the sample.
- Press  to start the measurement.

The measurement icon  appears on the display. The measurement icon  is blinking during measurement. When the meter reaches its endpoint, the measurement result displays on the screen.

4.3 Temperature measurement


For better accuracy, we recommend the use of the temperature probe. If a temperature probe is used, **ATC** and the sample temperature are displayed.


If the meter does not detect a temperature probe, it automatically switches to the manual temperature compensation mode and **MTC** appears. MTC temperature should be set. (See 3.3)

Note: The meter will only accept NTC 30 k Ω temperature sensor.





4.4 Using the memory

4.4.1 Storing a reading






The STARTER 300D can store up to 30 results. Press button-  when the measurement reaches its final reading. **M01** indicates that one result has been stored.

If you press button-  when **M30** is displayed, **FUL** indicates the memory is full. To store further data you will have to clear the memory (see 4.4.3).

4.4.2 Recalling from memory

- Press and hold button-  for 3 seconds to recall the stored values from memory when the current measurement reaches endpoint.
- Press button-  or button-  to scroll through the stored results. **R01** to **R30** indicates which result is being displayed. Press button-  to go back to the measurement screen.

4.4.3 Clearing the memory

Continue pressing button-  or button-  to scroll through the stored results until **MRCL** appears. Then press button- , **CLr** blinks. Press button-  again to confirm the deletion or press button-  to return to the measurement mode without deleting all the data in the memory.

5 MAINTENANCE

5.1 Error message

Error 0	Memory access error	Reset to factory settings
Error 1	Self-diagnosis failed	Repeat the self-diagnosis procedure and make sure that you finish pressing all five keys within two minutes.
Error 2	Measured values out of range	Make sure that the electrode setting cap has been removed and the electrode is properly connected and placed in the sample solution.
Error 3	Measured buffer temperature out of range (<0°C or >50 °C)	Keep the standard buffer temperature within the range for calibration or measurement.
Error 4	Cal 2 out of range	Make sure the buffer is correct and fresh; Clean or replace the DO electrode.
Error 5	Cal 1 out of range	Make sure the buffer is correct and fresh; Clean or replace the DO electrode.
Error 9	The current data set has already been stored once	A measurement can only be stored once. Perform a new measurement to store a new data set.

Any more problems, you can contact Ohaus sales rep.

5.2 Meter maintenance

Never unscrew the two halves of the housing!

The STARTER 300D does not require any maintenance other than replacement of depleted batteries. To clean, use a damp cloth.

The housing is made of acrylonitrile butadiene styrene (ABS). This material is susceptible to damage by some organic solvents, such as toluene, xylene and methyl ethyl ketone (MEK). Any spillage should be immediately wiped off.

5.3 Electrode maintenance



The DO sensor measures the oxygen based on galvanic principle. The DO electrode produces a mV-output proportional to the oxygen concentration present in the sample. Oxygen diffuses through the membrane and is being consumed at the cathode, producing an electrical current.

- Although the amount of oxygen consumed is low, a new sample should still **flow** past the membrane to prevent false readings.
- For maximum lifetime and maximum accuracy, the sensor should be handled with the proper care.
- Before and after use, rinse the sensor with clean pure water and wipe it with a soft tissue.

When storing the sensor for a longer period, make sure it is placed in the wetting cap supplied in the standard delivery. Also, deposits on the membrane should be removed with a tissue, because they hamper the diffusion of oxygen through the membrane.

Note: The filling solution in the electrode cap is 10% NaCl (Sodium Chloride). Cleaning and filling solutions should be handled with the same care as that given to toxic or corrosive substances.

5.4 Self-diagnosis






- Press and hold  &  simultaneously until the meter display the full screen. Each icon blinks one after the other. This way you may check whether all icons are correctly shown. The next step is to check that the keys are functioning correctly. This requires user interaction.

When **b** blinks, five icons are displayed.

- Press the five keys one by one in any order. Each time you press a key an icon disappears from the screen.
- Continue to press the other keys until all the icons have disappeared.
- When the self-diagnosis has been completed successfully, **PAS** appears. If self-diagnosis fails, error message **Err 1** appears.

Note: You have to finish pressing all five keys within two minutes, otherwise **Err 1** appears and you will have to repeat the procedure.

5.5 Recover factory settings

- When the meter is off, press and hold  &  &  together for 3 seconds, the screen displays “RST” and blinks, press  to reset factory settings (MTC, slope and offset, etc.).
- Press  to switch off the meter.

6 TECHNICAL DATA

6.1 Specifications

Ambient conditions

- Altitude: Up to 2000 m
- Specified Temperature range: 5°C to 40°C
- Humidity: maximum relative humidity 80 % for temperatures up to 30°C decreasing linearly to 50% relative humidity at 40°C
- Installation category: N/A
- Pollution degree: N/A
- Operability is assured at ambient temperatures between 5°C to 40°C

Model: ST300D

Measurement Range	%	0.0 to 199.9%; 200 to 400%
	mg/L	0.00 to 19.99; 20.0 to 45.0 mg/L
	ppm	0.00 to 19.99; 20.0 to 45.0 ppm
	Temp.	0 to 50 °C
Measurement Resolution	%	0.1%; 1%
	mg/L	0.1 mg/L; 1mg/L
	ppm	0.01 ppm; 0.1 ppm
	Temp.	0.1 °C
Barometric range	mmHg	375 to 825 mmHg
	mbar	500 to 1100 mbar
	hPa	500 to 1100 hPa
Barometric resolution	mmHg	1 mmHg
	mbar	1 mbar
	hPa	1 hPa
Accuracy	± 1% ; ± 0.3 °C	
Temp compensation	ATC&MTC	
Salinity compensation	0.0 to 50.0 ppt	
Calibration	2 points	
Memory	30 sets, last calibration data	
Power	4 x AAA(LR03) batteries, 250 hrs	
Size/Weight	90 W x 150 D x 35 H mm	
Weight	0.16kg	
Display	liquid crystal	
IP rating	IP54	
T input	Cinch, NTC 30 kΩ	
Materials	ABS	

Compliance



This product conforms to the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC. The Declaration of Conformity is available online at europe.ohaus.com/europe/en/home/support/compliance.aspx.



In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements. Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related. Disposal instructions in Europe are available online at europe.ohaus.com/europe/en/home/support/weee.aspx. Thank you for your contribution to environmental protection.

FCC Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

ISO 9001 Registration

In 1994, OHAUS Corporation, USA, was awarded a certificate of registration to ISO 9001 by Bureau Veritas Quality International (BVQI), confirming that the OHAUS quality management system is compliant with the ISO 9001 standards requirements. On June 21, 2012, OHAUS Corporation, USA, was re-registered to the ISO 9001:2008 standard.

LIMITED WARRANTY

Ohaus products are warranted against defects in materials and workmanship from the date of delivery through the duration of the warranty period. During the warranty period Ohaus will repair, or, at its option, replace any component(s) that proves to be defective at no charge, provided that the product is returned, freight prepaid, to Ohaus.

This warranty does not apply if the product has been damaged by accident or misuse, exposed to radioactive or corrosive materials, has foreign material penetrating to the inside of the product, or as a result of service or modification by other than Ohaus. In lieu of a properly returned warranty registration card, the warranty period shall begin on the date of shipment to the authorized dealer. No other express or implied warranty is given by Ohaus Corporation. Ohaus Corporation shall not be liable for any consequential damages.

As warranty legislation differs from state to state and country to country, please contact Ohaus or your local Ohaus dealer for further details

