



USER MANUAL

Document # 626471

ProOBOD IDS ProOBOD

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D.O.



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WARRANTY

The YSI ProOBOD[®] and IDS ProOBOD probe and cable assemblies are warranted for two (2) years from date of purchase by the end user against defects in materials and workmanship, exclusive of batteries and any damage caused by defective batteries. ProOBOD sensor caps are warranted for one (1) year from date of purchase by the end user against defects in material and workmanship. ProOBOD and IDS ProOBOD systems (instrument & cable/probe assemblies) are warranted for 1 year from date of purchase by the end user against defects in material and workmanship when purchased by rental agencies for rental purposes. Within the warranty period, YSI will repair or replace, at its sole discretion, free of charge, any product that YSI determines to be covered by this warranty.

To exercise this warranty, call your local YSI representative, or contact YSI Customer Service in Yellow Springs, Ohio at +1 937 767-7241, 800-897-4151, environmental@ysi.com or visit www.YSI.com for a Product Return Form. Send the product and proof of purchase, transportation prepaid, to the Authorized Service Center selected by YSI. Repair or replacement will be made and the product returned, transportation prepaid. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days from date of repair or replacement.

LIMITATION OF WARRANTY

This Warranty does not apply to any YSI product damage or failure caused by:

1. Failure to install, operate or use the product in accordance with YSI's written instructions;
2. Abuse or misuse of the product;
3. Failure to maintain the product in accordance with YSI's written instructions or standard industry procedure;
4. Any improper repairs to the product;
5. Use by you of defective or improper components or parts in servicing or repairing the product;
6. Modification of the product in any way not expressly authorized by YSI.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. YSI'S LIABILITY UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, AND THIS SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY DEFECTIVE PRODUCT COVERED BY THIS WARRANTY. IN NO EVENT SHALL YSI BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECTIVE PRODUCT COVERED BY THIS WARRANTY.

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INTRODUCTION

Thank you for purchasing a YSI Optical Biochemical Oxygen Demand probe (ProOBOD® or IDS ProOBOD). The ProOBOD is designed for use with a YSI ProODO® instrument. The IDS ProOBOD is designed for use with a YSI MultiLab IDS instrument. This manual provides information on the ProOBOD and IDS ProOBOD probes only. For more detailed instructions on how to operate the ProODO or MultiLab IDS instrument, please refer to the instrument-specific user manual.

The ProOBOD and IDS ProOBOD are designed to fit in a standard 300 ml BOD bottle as well as other international BOD bottles. YSI offers two ProOBOD probe versions and one IDS ProOBOD version:

- ProOBOD USA (Japan), YSI item number 626400 - This probe works with the ProODO instrument. It fits in standard USA BOD bottles, standard Japanese BOD bottles and many other international BOD bottles. A power supply for USA and Japanese style AC outlets is included.
- ProOBOD International, YSI item number 626401 - This probe works with the ProODO instrument. It fits in standard USA BOD bottles, standard Japanese BOD bottles and many other international BOD bottles. A funnel adapter for fitting in standard UK BOD bottles and a switching power supply with 3 international outlet adapters are also included.
- IDS ProOBOD, YSI item number 626500 - This probe works with a MultiLab IDS instrument. It fits in standard USA BOD bottles, standard Japanese BOD bottles and many other international BOD bottles. The MultiLab IDS instrument powers the probe's stir motor so an external power supply is not required. A funnel adapter for fitting in standard UK BOD bottles is available for purchase (item # 626473).

The OBOD sensors measure dissolved oxygen in water using lifetime luminescence technology and uses a digital signal to send information to the instrument. The probe features a stirrer and motor to aid in sample movement, to keep solids from settling at the bottom of the bottle and to quicken the response of the sensor. Key advantages of the OBOD's optical technology for DO measurement over traditional electrochemical methods include the elimination of sensor flow dependence and sensor warm-up time, greater stability, the ability to zero the sensor for more accurate measurements at low dissolved

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oxygen levels, and the elimination of frequent membrane/electrolyte changes and electrode servicing.

For more information on the ProODO and MultiLab IDS instruments, including product specification, please visit ysi.com or contact YSI Technical Support at 800-897-4151 (+1 937-767-7241), environmental@ysi.com.

Reading the entire manual before use is recommended for an overall understanding of the probe's features.



Important: The OBOD probes are designed for laboratory use, not field use. They are not waterproof and should never be immersed in a sample past the taper on the stem of the probe.

GETTING STARTED

Throughout the manual, the term "probe" refers to the end of the cable where the sensor, stir motor and stirrer are located. The term "sensor" refers to the Optical Dissolved Oxygen sensing portion of the probe assembly and the term "sensor cap" refers to the removable sensing cap that is replaced about once every 12 to 18 months (Figure 1).

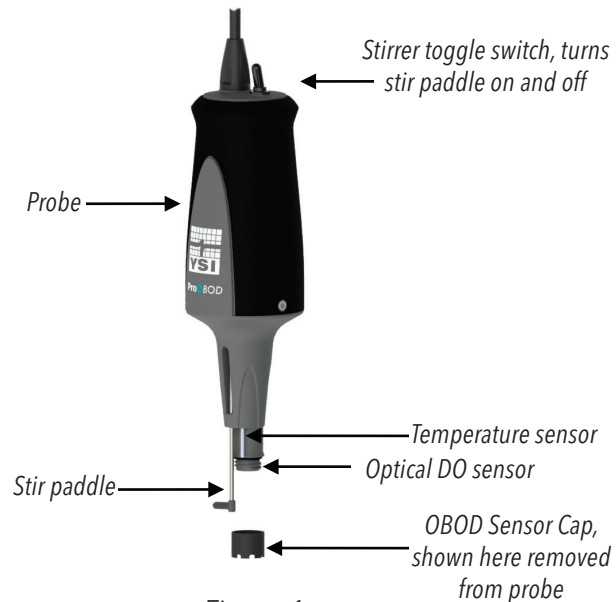


Figure 1

UNPACKING THE OBOD PROBE



Each OBOD probe and replacement OBOD sensor cap includes an instruction sheet with important information unique and specific to each individual cap.

Carefully unpack the instrument and accessories and inspect for damage. Compare received parts with items on the packing list. If any parts or materials are damaged or missing, contact YSI Customer Service at 800-897-4151 (+1 937 767-7241) or environmental@ysi.com or contact the authorized YSI distributor where the instrument was purchased.

Remove the OBOD probe/cable assembly from the shipping container and locate the instruction sheet that is included. This instruction sheet is important because it contains the calibration coefficients for your sensor cap. A new probe/cable assembly already has a sensor cap installed and the sensor cap coefficients are preloaded into the probe at the factory. The coefficients are automatically sent to the instrument when the probe is connected to the instrument. However, the probe instruction sheet should be saved in case you need to reference the coefficients in the future.

Preparing the probe for the first time:

1. A new OBOD probe will have a protective cover with a moist sponge placed over the sensor cap to ensure the cap remains hydrated during shipment. Carefully remove this cover from the end of the probe by pulling it straight off the sensor. Save the cover along with the sponge to use later for long term storage of the probe. Long term storage is generally considered to be 4 weeks or longer.
2. Place the probe in a standard BOD bottle that contains a small amount of clean water (approximately 40 ml). The sensor should not be immersed in water but rather in the air above the water. The purpose is to create a 100% water-saturated air environment for the sensor which is ideal for calibration and storage when not in use.




It is important to always keep your sensor in a moist environment so the sensor cap does not dry out. (See Maintenance and Storage for more information.)

OBOD PROBE OPERATION

Connect the OBOD probe to the instrument. If using a ProODO instrument, align the keys on the cable connector to the slots on the instrument connector. If using an IDS MultiLab instrument, locate the sensor connector and stirrer connector on the back of the instrument. See instrument manual for more information.

The OBOD probe will automatically be recognized by the instrument. If the sensor cap was installed on the probe at the factory, the sensor cap coefficients are preloaded into the probe and uploaded to the instrument when the probe is connected. If installing a new sensor cap, the new coefficients need to be entered in the instrument. See the instrument manual for more information.

On the ProODO instrument, press the Probe  key. Highlight DO and press enter. **Enabled** allows you to enable or disable the DO sensor. Highlight **Enabled** and press enter to activate or deactivate the dissolved oxygen sensor. The IDS MultiLab instrument will enable the probe automatically.

For additional information about the instrument's menus, settings and operation, please refer to the instrument's manual.

POWERING THE STIRRER

If using the IDS ProOBOD, the IDS MultiLab instrument will power the stirrer. Simply connect the IDS ProOBOD connectors to the appropriate connectors on the back of instrument.

If using the ProOBOD, locate the power supply that was included with the probe. Connect the power supply to the probe's power connector and then plug the power supply into an outlet. The international ProOBOD is shipped with outlet adapters to connect the power supply to a variety of outlets.

The stirrer can be turned on and off with the toggle switch located at the top of the probe (Figure 1).

CALIBRATION - DISSOLVED OXYGEN

The OBOD sensor is an optical luminescent sensor which has greater stability and is less susceptible to calibration drift than traditional electrochemical sensors. This increased stability means that the

instrument may hold its calibration for many months. However, for the highest data accuracy, YSI recommends verifying the instrument's calibration on a daily basis. To verify the instrument's calibration, place the sensor in a water-saturated air environment (BOD bottle with 40 ml of water) and check to see that the DO% measurement is reading its the calibration value based on the current barometric pressure. Refer to Appendix A for a list of DO% calibration values and corresponding barometric pressure readings. If DO Local is turned on, the instrument and probe will read 100% in its calibration environment.

There are several options for calibrating the OBOD sensors. For both ease of use and accuracy, YSI recommends performing a DO % water-saturated air calibration as described in the instrument's manual.

TEMPERATURE

All OBOD probes have built-in temperature sensors. Temperature calibration is not required nor is it available.

TAKING MEASUREMENTS



The OBOD probes are designed for laboratory use, not field use. They are not waterproof and should never be immersed in a sample past the taper on the stem of the probe.

1. To take readings, insert the probe into the BOD sample bottle. The DO and temperature sensors should be immersed in the sample.
2. Turn the stirrer on with the toggle switch located on the top of the probe (Figure 1). The stirrer helps keep solids from settling at the bottom of the sample bottle and quickens the sensor's response.
3. Allow the temperature readings to stabilize and wait approximately 20-25 seconds for the DO readings to stabilize.
4. See the instrument manual for information on logging data and sending data to a computer.

MAINTENANCE AND STORAGE

This section describes the proper procedures for care, maintenance and storage of the OBOD probes.



Important: Do not attempt to access the probe motor assembly or open the probe body. Doing so will void any remaining warranty. The probe body should only be opened by a YSI Authorized Service Center.

UPDATING INSTRUMENT AND PROBE FIRMWARE

The instrument and probe firmware can be updated via ysi.com. There you will find the new firmware files and instructions on how to update the instrument and/or probe.

SENSOR MAINTENANCE - DISSOLVED OXYGEN

CLEANING THE OBOD SENSOR CAP

The sensor cap should be kept clean since some types of fouling may consume or produce oxygen which could affect the dissolved oxygen measurements. To clean the sensor cap, gently wipe away any fouling with a lens cleaning tissue that has been moistened with water. Do not use a coarse towel or cloth or organic solvents to clean the sensor cap. Using a coarse towel or organic solvent to clean the sensor cap may cause permanent damage to the cap. For example, alcohol will dissolve the outer paint layer and other organic solvents will likely dissolve the dye in the cap. If the sensor cap is damaged, it must be replaced.

OBOD SENSOR CAP REPLACEMENT

When replacing a sensor cap, the Sensor Cap Coefficients must be manually updated in the instrument. The instruction sheet shipped with the replacement OBOD sensor cap includes the coefficients. See the instrument manual for instructions on updating the Sensor Cap Coefficients.

The frequency of sensor cap replacement is dependent on use. For example, when the probe is powered on for approximately 4 hours per day, 5 days a week, the sensor cap will need replaced about once per year. If the probe is powered on more than this, the sensor cap will need replaced more often.

To extend the sensor cap's usable life, turn the instrument off when not in use. For example, turn the instrument off over night, but not between readings.

The sensor cap will also need replaced if it is damaged or cracked. See the **Troubleshooting** section of this manual for instructions on how to determine if the sensor cap needs replaced.

The replacement OBOD sensor cap is shipped in a humidified container and the package should not be opened until the cap is needed for use. Once the sensor cap has been installed on the OBOD probe as described in this section, it is important to keep the sensor in a 100%

humid environment. Therefore, the OBOD sensor should be stored in either a BOD bottle that contains a small amount of clean water (approximately 40 ml) or in a BOD bottle that is filled with clean water so the sensor cap is immersed in water, see Sensor Storage for more information. If the sensor dries out, refer to the rehydration procedure in this manual for instructions on how to recondition the sensor cap.

Refer to Figure 2 below when following the instructions for replacing the cap.

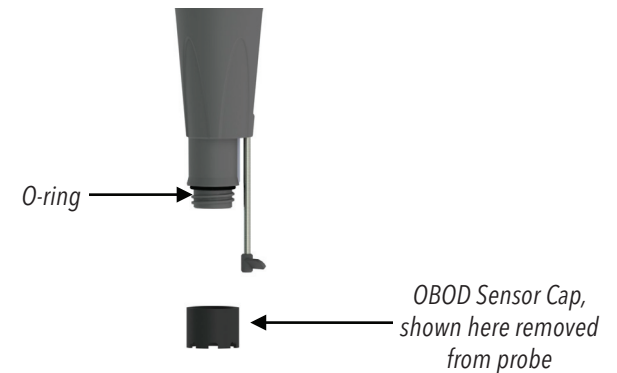


Figure 2.



Caution: Avoid touching the sensing end of the sensor cap during the following maintenance procedures.

1. Remove the stir paddle from the probe by pulling it straight out.
2. Remove the old sensor cap from the probe by grasping the probe body with one hand and then rotating the sensor cap counterclockwise until it is completely free. Do not use any tools for this procedure.
3. Carefully remove the o-ring and discard it. Do not use any tools to remove the o-ring.
4. Clean the o-ring seat on the probe by first wiping off old o-ring lubricant with a dry lens cleaning tissue. Next, clean away any build-up with a water-moistened lens tissue and then dry with another lens tissue.
5. Locate the o-ring supplied in the Sensor Cap replacement kit and install it on the probe. Do not use any tools to replace the o-ring. Be careful not to touch the clear optical DO sensor window. Any fingerprints on the optical window will have to be cleaned off. After installing the o-ring, ensure it is clean. If necessary, wipe clean with a lens tissue.

6. Locate the o-ring lubricant included with the new sensor cap. Apply a thin coat of o-ring lubricant to the installed o-ring. After application, there should be a thin coat of o-ring lubricant on the o-ring only. Remove any excess o-ring lubricant from the o-ring and/or probe with a lens tissue.
7. Clean the clear surface of the optical DO sensor window (figure 1) with a lens cleaning tissue.
8. Remove the new sensor cap from its hydrated container and dry the inside cavity of the sensor cap with lens tissue. Make sure that the cavity is completely dry and clean before proceeding with the installation. Using a clockwise motion, thread the new sensor cap onto the probe assembly until it is finger-tight. The o-ring should be compressed between the sensor cap and probe. Do not over-tighten the sensor cap and do not use any tools for the installation process.
9. Clean the stir paddle and then reinstall it on the probe by pushing it straight into place.
10. Store the sensor in a BOD bottle with a small amount of water (approximately 40 ml).
11. Enter the new Sensor Cap's coefficients into the instrument. See the instrument's manual for more information on entering coefficients.
12. After entering the new Sensor Cap coefficients, perform a 1-point DO calibration.

REHYDRATING THE SENSOR CAP

The Sensor Cap must remain in a moist environment for proper operation; see Sensor Storage for storage recommendations. If you inadvertently leave your sensor exposed to ambient air for a period of more than approximately 8 hours it may dry out. If the sensor cap is allowed to dry out, it is likely to drift slightly at the beginning of your next study unless it is rehydrated. If the cap dries out, you can rehydrate it by soaking the probe tip with the sensor cap installed in warm (room temperature) tap water for 24 hours. After rehydration is complete, perform a 1-point DO calibration and be sure to store the probe in a moist environment.

SENSOR MAINTENANCE - TEMPERATURE

You must keep the temperature portion of the sensor free of build up. Other than that, the sensor requires no maintenance. A soft bristle brush can be used to scrub the temperature sensor if needed. While cleaning, be sure to only scrub the temperature sensor and not the sensor cap. The sensor cap will be damaged if cleaned with anything abrasive.

SENSOR STORAGE

SHORT-TERM STORAGE

When the OBOD is not in use, it must be stored in a moist environment, i.e., the sensor either immersed in water or in water-saturated air. If the sensor cap is allowed to dry out by exposure to dry air, it is likely to drift slightly at the beginning of its next use unless it is rehydrated. If this occurs, follow the rehydrating instructions in this manual.

For short-term storage (<30 days), place the probe in a BOD bottle that contains a small amount of clean water (approximately 40 ml). This will provide a 100% water-saturated air environment.

LONG-TERM STORAGE

For long-term storage (>30 days), remove the batteries from the instrument. Moisten the sponge in the protective plastic cap that was originally provided with the probe with clean water. Place the clear cap over the sensor with the sensor cap installed. Inspect the sponge every 30 days to make sure it is still moist. If you no longer have the protective cap, place the probe in a BOD bottle that contains a small amount of clean water (approximately 40 ml). Or, you can place the sensor with sensor cap installed directly in water in a BOD bottle.

*Recommended Long-term Storage ambient
temperature: -5 to 50°C (23 to 122°F)*

TROUBLESHOOTING

DISSOLVED OXYGEN READINGS

Erroneous dissolved oxygen readings typically indicate a need to clean the sensor cap, replace the sensor cap and/or recalibrate the instrument.

First, verify that the instrument is measuring temperature accurately. Both the DO % and mg/L measurements are temperature dependent so if the temperature reading is incorrectly, the DO measurements will also be erroneous.

If the DO% measurement is accurate but the mg/L value is incorrect, check the salinity compensation setting in the instrument. The salinity compensation value should be set to the salinity of the sample you are testing. Municipal wastewater is typically 0 ppt.

If the DO% measurement is incorrect in a water-saturated air environment (BOD bottle with 40 ml of clean water) after calibration, ensure the instrument's barometer reading is correct by comparing it to the local, true barometric pressure.

If you continue to have erroneous DO readings, verify the sensor is properly connected to the instrument. If using the ProODO instrument, be sure DO is enabled in the Probe menu. Next, clean the sensor cap following the instructions in the **Maintenance and Storage** section of this manual and then perform a calibration. If erroneous readings persist, follow the steps on the following page to inspect the sensor cap for damage and then attempt to recalibrate the instrument. If the problem continues, try to rehydrate the sensor cap and then recalibrate. If you are still getting erroneous dissolved oxygen readings, try replacing the sensor cap and then recalibrate. If the erroneous readings continue, contact YSI Technical Support to help determine the next step.

INSPECTING THE SENSOR CAP FOR DAMAGE



Caution: Avoid touching the sensing end of the sensor cap during the following maintenance procedures.

If DO measurements seem to be in error or are jumpy, remove the sensor cap from the sensor by grasping the probe body with one hand and then rotating the sensor cap counterclockwise until it is completely free. Do not use any tools for the removal of the cap.


Inspect the sensor cap assembly for any cracks or damage. If damage has occurred, contact YSI Customer Service to order a replacement sensor cap (YSI item number 626482).

Inspect the o-ring on the probe for damage. If there is any indication of damage, carefully remove the o-ring and contact YSI Technical Support to obtain a new o-ring and/or gasket. Avoid using tools to remove the o-ring as damage to the sealing surfaces could result.

Before reinstalling the sensor cap, make sure that the cavity is completely clean and dry before proceeding with the installation. If water is found, dry the cavity with lens tissue. Finally, clean and dry the clear optical DO sensor window on the end of the sensor with a lens tissue.

After reinstalling the sensor cap, perform a calibration and then reevaluate the quality of the dissolved oxygen measurements. If problems persist, try rehydrating or replacing the sensor cap.

ERROR/STATUS MESSAGES

While using of the ProODO instrument, press the **Question**  key from any screen to view helpful messages directly on the display.

Refer to the instrument manual for information on error and status messages.

PROBE SPECIFICATIONS

The specifications listed below are system specifications for the ProOBOD probe when used with a ProODO instrument. These specifications are subject to change without notice. For the most recent specifications and for specifications on the ProODO instrument, please visit ysi.com.

Probe (ProOBOD probe and cable Assembly)	
Temperature Operating Range	10 - 40°C
Water Resistance	IP-65
Cable Length	2 meters (6.56 feet)
Dissolved Oxygen	
Sensor Type	Optical, Life-time Luminescent sensor
Range	0-50 mg/L 0-500 % Saturation
Accuracy (mg/L)	<ul style="list-style-type: none"> • 0 to 20 mg/L: ± 0.1 mg/L or $\pm 1\%$ of reading, whichever is greater. • 20 to 50 mg/L: $\pm 15\%$ of the reading
Accuracy (% Saturation)	<ul style="list-style-type: none"> • 0 to 200% air saturation: $\pm 1\%$ of the reading or $\pm 1\%$ air saturation, whichever is greater. • 200 to 500% air saturation: $\pm 15\%$ of the reading
Resolution (mg/L)	0.01 or 0.1 mg/L (auto-scaling)
Resolution (% Saturation)	0.1% air saturation
Response Time	T95 = 20-25 seconds with stirring; T95 = 40 seconds without stirring.

Temperature	
Range	-5 to 50°C
Accuracy	± 0.2°C
Resolution	0.1°C

ACCESSORIES / PARTS LIST

Part Number	Description
626281	ProODO Instrument
626400	ProOBOD USA/Japan BOD lab probe* for use with ProODO instrument
626401	ProOBOD International BOD lab probe* for use with ProODO instrument
626500	IDS ProOBOD* for use with MultiLab instruments
626482	Replacement sensor cap for ProOBOD and IDS ProOBOD lab probe
626600	6260 power supply for use with 626400 ProOBOD USA/Japan BOD probe
626601	6261 power supply for use with 626401 ProOBOD International probe
626415	Stir Shaft
626473	K Funnel, for use in UK standard BOD bottles

*All probe/cable assemblies include a temperature and dissolved oxygen sensor.

DECLARATION OF CONFORMITY

We declare under our sole responsibility that the listed product conforms to the requirements for the listed European Council Directive(s) and carries the CE mark accordingly. It conforms to Australian and New Zealand EMC requirements for C-Tick and RCM marks. It conforms to unintentional radiator requirements under FCC Part 15 and ICES-003 Class B.

Manufacturer:	YSI Incorporated 1725 Brannum Lane Yellow Springs, OH 45387 USA
Product Name:	Professional ODO Water Quality Instrument and Professional OBOD probe
Model Numbers	
Instrument/Accessory:	ProODO (626281) / ProComm Saddle manufactured after September 1, 2010 (Lot code 10J and later) (605404)
Probe/Cable Assemblies:	ProOBOD (626400, 626401) IDS ProOBOD (626500)
Conforms to the following:	
Directives:	EMC 2004/108/EC RoHS 2011/65/EU WEEE 2002/96/EC
Harmonized Standards:	<ul style="list-style-type: none"> • EN61326-1:2006. • EN61326-2-3:2006. • EN61000-3-2:2006. • EN61000-3-3:2008. • CAN/CSA-CEI/IEC CISPR 22:02
Supplementary Information:	All performance met the continuous unmonitored operation criteria as follows: EN61000-4-2:2009 EN61000-4-3: 2006 EN61000-4-4:2004 EN61000-4-5: 2006 EN61000-4-6: 2009 EN61000-4-11:2004
Authorized EU Representative	YSI Hydrodata Ltd 2 Focal Point, Lacerta Court, Works Road Letchworth, Hertfordshire, SG6 1FJ UK



Signed: Lisa M. Abel
Title: Director of Quality

Date: 24 April 2013

RECYCLING

YSI is committed to reducing the environmental footprint in the course of doing business. YSI's recycling program ensures that old equipment is processed in an environmentally friendly way, reducing the amount of materials going to landfills. When the time comes for you to recycle, follow the easy steps outlined at ysi.com.

CONTACT INFORMATION

ORDERING AND TECHNICAL SUPPORT

YSI has offices located throughout the world. For a listing of office locations along with contact information, please visit ysi.com or contact YSI Customer Service:

Telephone: 800-897-4151 (US)
+1 937-767-7241
Monday through Friday, 8:00 AM to 5:00 ET

Fax: +1 937-767-9353 (orders)
+1 937-767-1058 (technical support)

Email: environmental@ysi.com

Mail: YSI Incorporated
1725 Brannum Lane
Yellow Springs, OH 45387 USA

Internet: ysi.com

When placing an order please have the following available:

- 1.) YSI account number (if available)
- 2.) Name and phone number
- 3.) Purchase Order or Credit Card
- 4.) Model Number or brief description
- 5.) Billing and shipping addresses
- 6.) Quantity

SERVICE INFORMATION

YSI has authorized service centers throughout the United States and Internationally. For the nearest service center information, please visit www.ysi.com and click 'Support' or contact YSI Technical Support at 800-897-4151 (+1 937-767-7241).

When returning a product for service, include the Product Return form with cleaning certification. The form must be completely filled out for a YSI Service Center to accept the instrument for service. The form may be downloaded from the 'Support' page at www.ysi.com.

APPENDIX A-DO% CALIBRATION VALUES

Pressure				Altitude		Calibration value
Inches Hg	mm Hg	kPA	mbar	Feet	Meters	% Saturation
30.2	767.6	102.3	1023	-276	-84	101
29.92	760	101.3	1013	0	0	100
29.62	752.4	100.3	1003	278	85	99
29.32	744.8	99.3	993	558	170	98
29.02	737.2	98.3	983	841	256	97
28.72	729.6	97.3	973	1126	343	96
28.43	722	96.3	963	1413	431	95
28.13	714.4	95.2	952	1703	519	94
27.83	706.8	94.2	942	1995	608	93
27.53	699.2	93.2	932	2290	698	92
27.23	691.6	92.2	922	2587	789	91
26.93	684	91.2	912	2887	880	90
26.63	676.4	90.2	902	3190	972	89
26.33	668.8	89.2	892	3496	1066	88
26.03	661.2	88.1	881	3804	1106	87
25.73	653.6	87.2	871	4115	1254	86
25.43	646	86.1	861	4430	1350	85
25.13	638.4	85.1	851	4747	1447	84
24.84	630.8	84.1	841	5067	1544	83
24.54	623.2	83.1	831	5391	1643	82
24.24	615.6	82.1	821	5717	1743	81
23.94	608	81.06	811	6047	1843	80
23.64	600.4	80.05	800	6381	1945	79
23.34	592.8	79.03	790	6717	2047	78
23.04	585.2	78.02	780	7058	2151	77
22.74	577.6	77.01	770	7401	2256	76
22.44	570.0	75.99	760	7749	2362	75

Pressure				Altitude		Calibration value
Inches Hg	mm Hg	kPA	mbar	Feet	Meters	% Saturation
22.14	562.4	74.98	749	8100	2469	74
21.84	554.8	73.97	739	8455	2577	73
21.54	547.2	72.95	729	8815	2687	72
21.26	539.6	71.94	720	9178	2797	71
20.94	532	70.93	709	9545	2909	70
20.64	524	69.92	699	9917	3023	69
20.35	517	68.91	689	10293	3137	68
20.05	509	67.9	679	10673	3371	67
19.75	502	66.89	669	11058	3371	66

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