

DO-6

Dissolved Oxygen Meter

Operator's Manual



Newport Electronics, Inc.

Additional products from



Newport Electronics, Inc.

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In the USA and Canada: 800-NEWPORT
In Mexico 95-800-NEWPORT
Or call your local Newport Office.

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This product may be covered by one or more
of the following patents:

United States Patents Des. 336,895; 5,274,577

France Brevet No. 91 12756

Spain 2039150

United Kingdom Patent No. 2248954

and other international patents pending

From the technical library of:

Warranty

All Products from NEWPORT ELECTRONICS, INC. are warranted against defective material and workmanship for a period of one (1) year from the date of delivery.

If the unit should malfunction, it must be returned to the factory for evaluation. NEWPORT's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by Newport, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of NEWPORT's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

In addition to NEWPORT's standard warranty period, NEWPORT ELECTRONICS will extend the warranty period for one (1) additional year only if the warranty card enclosed with each instrument is returned to NEWPORT.

Newport is glad to offer suggestions on the use of its various products. Nevertheless, NEWPORT warrants only that the parts manufactured by it will be as specified and free of defects. NEWPORT MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of NEWPORT with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall NEWPORT be liable for consequential, incidental or special damages.

Every precaution for accuracy has been taken in the preparation of this manual; however, NEWPORT neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the products in accordance with the information contained in the manual.

SPECIAL CONDITIONS: Should this equipment be used in any nuclear installation or activity, purchaser will indemnify NEWPORT and hold NEWPORT harmless from any liability or damage whatsoever arising out of the use of the equipment in such a manner.

Return Requests

Direct all warranty and repair requests/inquiries to the NEWPORT Customer Service Department. BEFORE RETURNING ANY PRODUCTS(S) TO NEWPORT, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM NEWPORT'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit. NEWPORT's warranty does not apply to defects resulting from action of the buyer, mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting NEWPORT:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult NEWPORT for current repair charges. Have the following information available BEFORE contacting NEWPORT:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

For technical or application assistance please call:

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France
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FAX: 33 (1) 30.69.91.20

In Mexico

TEL: 95-800-NEWPORT

Unpacking

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):.

Soft carrying case (1)

9V alkaline battery (1)

Operator's Manual (1)

The carrying case contains the following:

Small screwdriver (1)

DO-6 Meter (1)

PHDG-8200 /N membrane kit (1)
(It may be in a second box)

If you have any questions about the shipment, please call the NEWPORT Customer Service Department.

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.



DO-6
Dissolved Oxygen Meter

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General Description

The NEWPORT® DO-6 meter combines a polarographic dissolved oxygen sensor with an integral RTD for dissolved oxygen and temperature measurements in the lab, plant or field. By using a small cathode which consumes minimal oxygen, the need for sample stirring is minimized to provide a more stable response. Included are the sensor, screwdriver, and vinyl case. Optimal items for this meter include the extension cable (length - 2 meters) - NEWPORT part number CDEC-60/N, and replacement membrane kit for probe - NEWPORT part number PHDG-8200/N.

Parts of the Meter

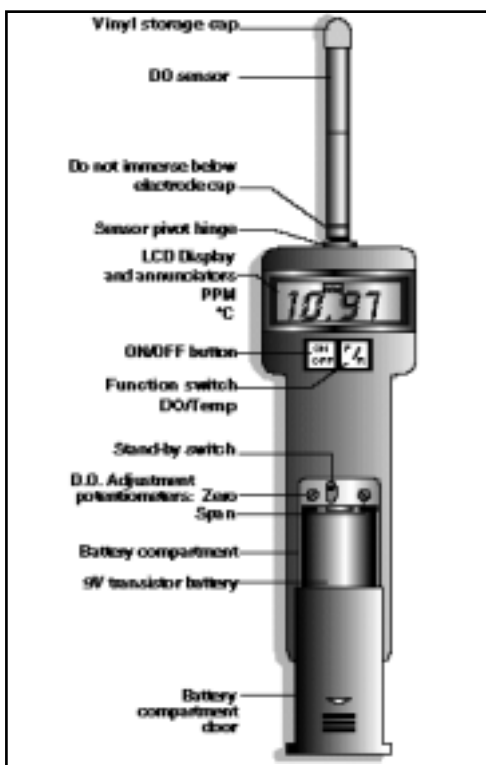


Figure 1. Parts of the Meter



Setting Up the Meter

Installing the Battery (Fig. 2)

Carefully remove the meter from the carrying case making sure you don't lose the small screwdriver.

To install/change the battery, do the following:

1. Insert your thumb in the recessed area of the battery compartment door and pull it away from the display.
2. Snap the 9V alkaline battery into the battery clip.
3. Place the battery clip/battery assembly at the top of the battery compartment.
3. Replace the battery compartment door and snap into place.

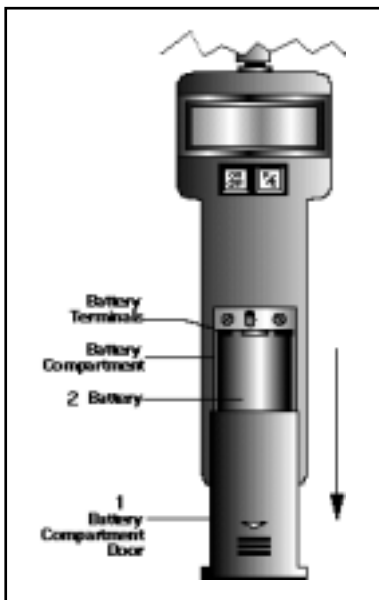


Figure 2. Installing the Battery



Operating Instructions

1. Slide the stand-by switch to the stand-by position 30 minutes prior to using the Dissolved Oxygen (D.O.) meter. This polarizes the sensor and prepares it for testing.
2. Adjust the polarographic D.O./Temp sensor to the 90° or 180° measurement position.
3. Remove the protective plastic cap. Rinse the sensor in distilled water and immerse the sensor 1/2 its length in the solution to be measured.
4. For the reading to be accurate, the solution must be stirred. If in the lab, use a magnetic stirrer. If in the field, stir the solution with the sensor, taking care not to bang the sensor.
5. The sensor should be at the same temperature as the solution. An integral 1000 ohm platinum RTD provides ATC and temperature reading. To read the solution temperature, depress the F/R switch. When (C) appears in the display and the reading has stabilized, read the temperature. When the standby switch is in the "OFF" position, the instrument cannot be turned on, preventing accidental actuation of the meter.
6. Press the F/C switch again ("PPM" will be displayed), wait for the reading to stabilize (1 or 2 minutes), and take the dissolved oxygen reading.



Operating Tips

When a constant shift in the D.O. reading is observed, the sensor should be cleaned and the old membrane replaced. Use the replacement membrane kit (NEWPORT part number PHDG-8200/N) to clean the probe.

1. Unscrew the lower cap portion of the probe and discard the fill solution that it contains.
2. Remove the serrated ring that holds the membrane in place (it is a force fit over the membrane and can be removed by twisting it and pulling it off the cap).
3. Remove the old membrane from the end of the cap.
4. Place the new membrane over the end of the cap, and force the serrated ring over the membrane (this will stretch the membrane tightly across the end of the cap).
5. Fill the cap with KCl filling solution, using the syringe provided in the kit.
6. Clean the glass tip with a tissue
7. Remove all spots and oxide from the metal tube. The metal tube should shine white, since it is made out of silver.
8. Screw the probe cap in place (excess fill solution will escape around the threads), and wipe clean.
9. The probe is now ready for use.



Calibrating the Meter

The D.O. instrument is calibrated at the factory and ready for use upon receipt. Calibration should be verified periodically to insure accurate results. In order to calibrate, you will need an aerated water sample, and pure nitrogen or a sodium sulfite solution.

1. Slide the stand-by switch to the stand-by position 30 minutes prior to calibrating the dissolved oxygen meter.
2. Remove the protective cap and rinse with tap water.
3. Immerse the sensor in the aerated water sample. Make sure to allow the water sample to become thoroughly aerated.
4. Switch the instrument to the temperature range and observe the temperature reading.
5. Switch the instrument back to the D.O. (Dissolved Oxygen) function shown as PPM (Parts Per Million) on the display.
6. Use the temperature vs. PPM of D.O. chart to find the corresponding value. Refer to Table 1.
7. Adjust the instrument Span screw to indicate the correct PPM value.
8. Next, immerse the sensor in the zeroing solution (saturated sodium sulfite solution) for approximately five minutes.
9. Once the sensor has stabilized, adjust the Zero screw to zero.
10. The dissolved oxygen instrument is now ready for use.



Table 1

Dissolved Oxygen PPM vs. Temperature

°C	PPM	°C	PPM	°C	PPM
0	14.6	12	10.8	24	8.5
1	14.2	13	10.6	25	8.4
2	13.8	14	10.4	26	8.2
3	13.5	15	10.2	27	8.1
4	13.1	16	10.0	28	7.9
5	12.8	17	9.7	29	7.8
6	12.5	18	9.5	30	7.6
7	12.2	19	9.4	35	7.1
8	11.9	20	9.2	40	6.6
9	11.6	21	9.0	45	6.1
10	11.3	22	8.8	50	5.6
11	11.1	23	8.7		

Specifications

Dissolved Oxygen

Range: 0.00 to 19.99PPM

Resolution: 0.01 PPM

Accuracy: $\pm 1.5\%$ FS

Temperature Range

Range: 0.0 to + 100.0°C

Resolution: 0.1°C

Accuracy: $\pm 0.2^\circ\text{C}$

Automatic

Temperature

Compensation: 0 to 40°C

Power: 9V Battery

Dimensions: 6.25" x 1.25" x 2.25"

Weight: 9.5oz