 **OMEGA**
ENGINEERING, INC.
An OMEGA Technologies Company



PHDG-80
Dissolved Oxygen
Meter



Operator's Manual



WARRANTY

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 13 months from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that our customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. Our Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, 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 current, heat, moisture, vibration, or misuse. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

THERE ARE NO WARRANTIES EXCEPT AS STATED HEREIN. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL OMEGA ENGINEERING, INC. BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES. THE BUYER'S SOLE REMEDY FOR ANY BREACH OF THIS AGREEMENT BY OMEGA ENGINEERING, INC. OR ANY BREACH OF ANY WARRANTY BY OMEGA ENGINEERING, INC. SHALL NOT EXCEED THE PURCHASE PRICE PAID BY THE PURCHASER TO OMEGA ENGINEERING, INC. FOR THE UNIT OR UNITS OR EQUIPMENT DIRECTLY AFFECTED BY SUCH BREACH.



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Stamford, Connecticut 06907-0047
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Return Requests/Inquiries

Direct all warranty and repair requests/inquiries to OMEGA Customer Service Department, telephone number (203) 359-1660. BEFORE RETURNING ANY INSTRUMENT, PLEASE CONTACT THE OMEGA CUSTOMER SERVICE DEPARTMENT TO OBTAIN AN AUTHORIZED RETURN (AR) NUMBER. The designated AR number should then be marked on the outside of the return package.

To avoid processing delays, also please be sure to include:

1. Returnee's name, address, and phone number.
2. Model and Serial numbers.
3. Repair instructions.

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M846/O48

GENERAL DESCRIPTION

The OMEGA® PHDG-80 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. Optional items for this meter include the extension cable (length - 2 meters) - OMEGA part number PHEC-8200, and replacement membrane kit for probe - OMEGA part number PHDG-8200.

SPECIFICATIONS

FUNCTION	RANGE	RESOLUTION	ACCURACY
Dissolved Oxygen	0.00 to 19.99 PPM	0.01 PPM	±1.5% FS
Temperature Range	0.0 to +199.9°C	0.1°C	±0.2°C

AUTOMATIC TEMPERATURE COMPENSATION: 0 to 40°C
POWER: 9V Battery
DIMENSIONS: 6¼" x 1¼" x 2¼"
WEIGHT: 8.5 oz

OPERATING INSTRUCTIONS

1. Slide the standby switch to the ON 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 ½ 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. Depress 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 - D.O. SENSOR MAINTENANCE

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 (OMEGA part number PHDG-8200) 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.
6. Clean the glass tip with a tissue.
7. Screw the probe cap in place (excess fill solution will escape around the threads), and wipe clean.
8. The probe is now ready for use.

CALIBRATION

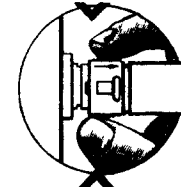
The D.O. instrument is calibrated at the factory and ready for use upon receipt. Calibration should be verified periodically to insure accurate results. In order to calibrate, you will need an aerated water sample, and pure nitrogen or a sodium sulfite solution.

1. Slide the stand-by switch to the ON position 30 minutes prior to calibrating the dissolved oxygen meter.
2. Remove the protective cap and rinse with distilled 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 (shown as °C).
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 instruments 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.

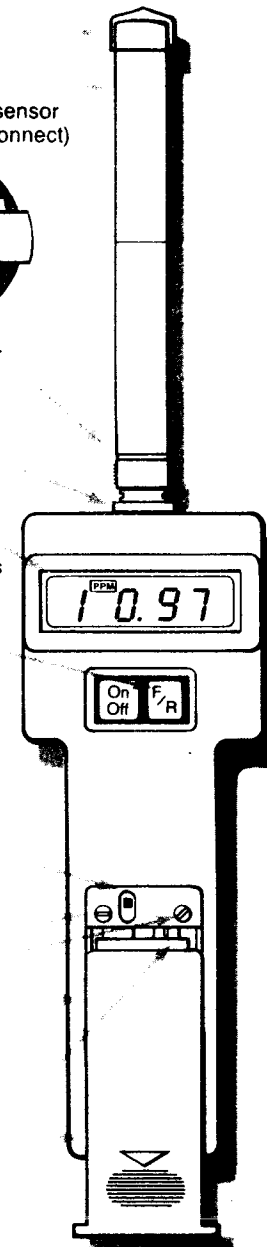
TABLE 1
DISSOLVED OXYGEN PPM VS. TEMPERATURE (IN DISTILLED WATER)

°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		

1. Vinyl storage cap
2. DO sensor Quick connect sensor (Squeeze to disconnect)



3. Do not immerse below sensor cap
4. Sensor pivot hinge
5. LCD display and annunciators PPM °C
6. Function switch DO/Temp



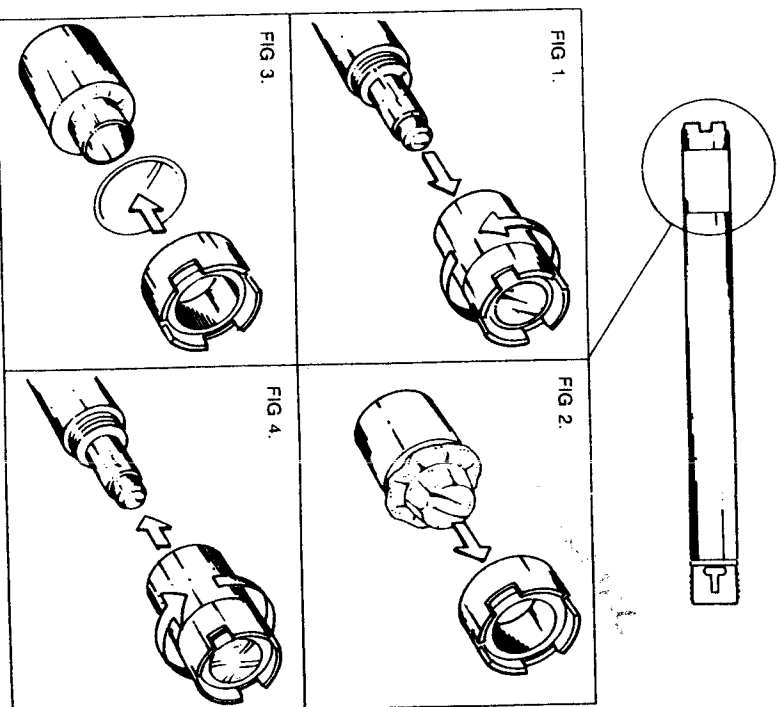
7. Stand-by switch
8. D.O. adjustment potentiometers: Zero Span
10. Battery compartment
11. 9V transistor battery
12. Battery compartment door

Figure 1. PHDG-80 Dissolved Oxygen Meter

Table 1
 Dissolved Oxygen PPM vs. Temperature
 (in distilled water)

° 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	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	45	6.1
10	11.3	22	8.8	50	5.6
11	11.1	23	8.7		

Figure 1



1 cc of solution
 in 100 cc
 5% KO₂ solution