



Operation Manual

Marin Control Digital

Digital Meter for the measurement of Temperature, salinity and specific gravity in saltwater aquariums.



Short instructions:



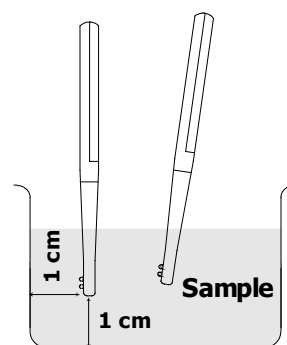
: Is used to turn the power on and off.
Once turned on, the present **Temperature** is displayed in the LCD Display window.



: The default mode is the **Temperature** measurement. Press to cycle to **Salinity** measurement (ppt), press again to cycle to **Specific Gravity** measurement.



: Is used to "lock" the measurement value during a test. After viewing measurement, press again to clear LCD screen and start another test.



For more accurate measurement

°C	Indicates the Temperature of sample.
ppt	Indicates the Salinity contained within the sample.
(0.000)	Indicates the Specific Gravity within the sample.
HOLD	Is displayed in the LCD display window when the measured value is held.
ERROR	Appears when the measurement is not within the normal testing range. Temp. range (0°C□100°C) Salinity Range (5□40 ppt) Specific Gravity (1.000□1.032)
B	Is displayed when replacement of battery is needed.

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1. CAUTION

The **Marine Control Digital** has been developed for the purpose of measuring the Temperature, Salinity and Specific Gravity of natural seawater and / or synthetic seawater. This meter has been factory calibrated and performance tested to ensure accurate readings.

1.1 Precaution before use

Please read the entire operation manual before using this **Marin Control Digital**. Failure to read this manual prior to usage may result in equipment damage and will void warranty.



Caution: Please observe the procedures and methods specified in the operation manual to ensure precision, accuracy and reliable measurements and user safety.

Warning: When the procedures and methods are not observed, accuracy and reliability of the measurements cannot be guaranteed. This may lead to issues of safety and equipment failure.

1.2 Cautions on safety



Please keep this product away from children. Ingestion of small parts may lead to choking and serious injury. If the sensor protection cap or battery is swallowed, please consult a physician immediately.


The sensors and 8 cm above it are waterproof. Please do not submerge beyond the "Water Line" labeled on the digital tester. Avoid water contact above this line to prevent permanent damage.

Please avoid damage to the sensors during cleaning. Be very careful not to scratch the surface of the gold plated sensors.


Use a damp cloth or tissue to clean the main body of the tester. Use of chemicals such as acetone or benzene may cause deterioration of the ABS housing.

Never attempt to disassemble or modify this product, this will void warranty.

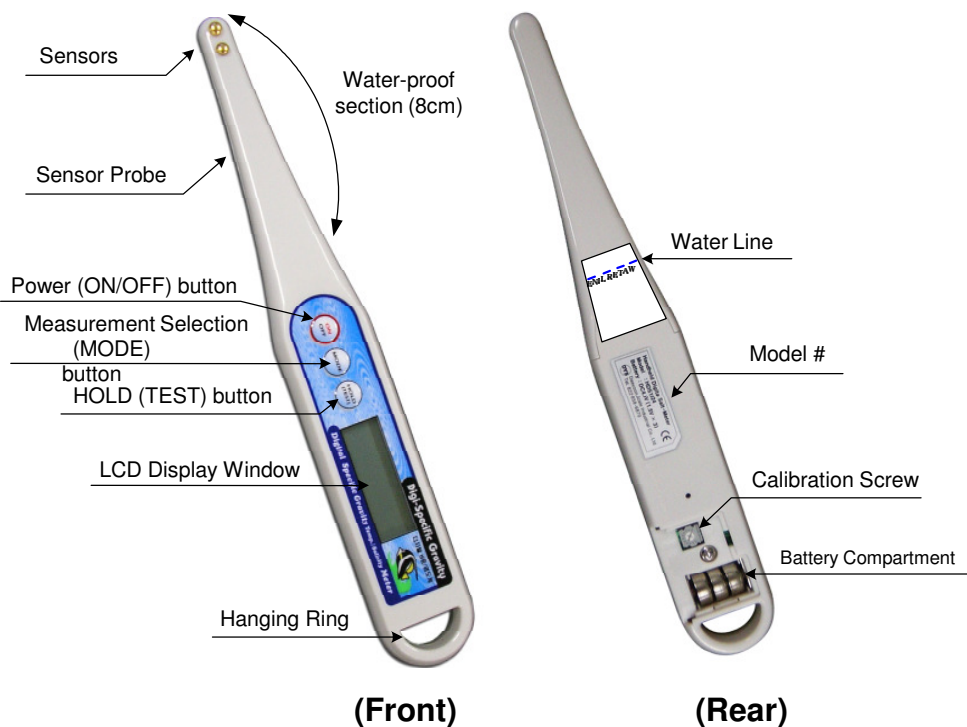
1.3 Cautions on measuring

	<p>Please wash the sensors with a neutral detergent using a soft cloth or sponge before and after use for the most reliable test results. Dry off sensors with a clean cloth and always keep dry while not in use.</p> <p>Make sure sensors do not contact any of the walls of the aquarium or sump while in measurement mode. Contact of any solid material can give false lower readings.</p> <p>Keep sensors at least 1cm from the side and bottom of the measuring container.</p>
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1.4 Cautions on ownership

	<p>Avoid keeping Marine Control Digital in high humidity environments, direct exposure to sunlight, high temperatures, dust and moisture to prevent damage.</p> <p>Please keep sensor cap inserted to protect the sensors when not in use.</p> <p>Always remove the batteries if tester will not be used for long periods (over 1 month).</p>
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2. Product structure and function



2.1 Functions

Sensors

Measures the temperature, salinity and specific gravity. The sensors surface is plated with gold protecting the sensors contained inside. The sensors are waterproof.

Power ("ON/OFF") button

Turns power on/off. Battery saving feature will automatically turn the handheld off if not used within one minute.

Measurement Selection (MODE) button

When the power is turned on, the default mode is the **Temperature** measurement. Press to cycle to **Salinity** measurement (ppt), press again to cycle to **Specific Gravity** measurement.

Hold (TEST) button

It is used to “lock” the measurement value during a test. After viewing measurement, press again to clear LCD screen and start another test.

Calibration Screw (Salinity)

When the Salinity is abnormal, you can calibrate your digital handheld tester by opening the cover on the back of the main body and adjust the screw with a Phillips screwdriver so that the LCD display window coincides exactly with the value of the standard solution (35 ppt Salinity). Please refer to section (5) for detailed instructions.

Note: All Marine Control Digital have been factory tested and calibrated for accuracy.

3. Product Specification

Name	Marine Control Digital
Measurement target	Aqueous solution (Seawater and / or Synthetic seawater)
Measurement method	Electric conductivity measurement system
Salinity measurement	Measurement range: 5ppt-40ppt Measurement accuracy : ± 2 ppt Measurement temperature range : 0°C-70°C
Temperature measurement	Measurement range : 0°C-100°C Measurement accuracy : ± 1 °C temperature range: 0°C-70°C) of reading
Specific Gravity	Measurement range:1.000-1.032 Measurement accuracy: ± 0.002 S.G Measurement Temperature range: 0°C-40°C
Resolution	Salinity: 0.1ppt (5-9ppt), 1ppt (10-40ppt) Temperature: 0.1°C Specific Gravity: 0.001
Power Supply	LR44 Button Battery x 3 pcs
Battery life	About 3 months based on 3 times use per day
Size	16.4 (D) x 32 (H) x 255 (W) mm
Weight	About 57g (including button battery)
Accessories	Button battery 6 pcs, Sensor protection cap 1 ea, Instruction manual 1 vol., 35ppt Salinity Standard Solution (40g) 1 Btl

4. Measurement of Salinity, Temperature and Specific Gravity

4.1 Principle of salinity measurement

The salinity measurement principle of this product is based on the electric conductivity measurement method. Salt exists as sodium ion and chloride ion within aqueous solution. As the quantity of sodium ion and chloride ion increases, the solution conductivity also increases proportionately to the increased salt concentration. Using this principle, salinity is determined by calculating the conductivity of a given sample.

4.2 Testing Temperature, Salinity and Specific Gravity

1. Wipe the sensor gently with a wet cloth or tissue each time prior to use: sensors may be contaminated with invisible foreign materials that may give false readings.
2. Press (“ON/OFF”) button, the present **Temperature** is displayed in the LCD display window.
3. Insert the probe into the aquarium, be careful not to submerge beyond the “Water Line” mark that is labeled on the back of the tester. Please be sure that sensors are completely submerged to gain an accurate readings.
4. It will take approximately 10 seconds for the temperature to be stabilized. Wait until the temperature stabilizes. After confirming the temperature, push the (“MODE”) button to switch to **Salinity** measurement.
5. Wait 10 seconds and confirm the **Salinity** (ppt) measurement. Press (“MODE”) once again to cycle to **Specific Gravity** measurement.

6. Wait 10 seconds for the Specific Gravity to stabilize and read results.
7. You may press the ("HOLD") button at anytime to "lock" the measurement so you do not have to keep the probe submerged in the water to read the measurement value. Press again to "unlock" and test again.
8. Press ("ON/OFF") when you are finished. Your Battery Saving Function will automatically shut off your tester if no activity, is detected within 1 minute.
9. Wash the sensors with neutral detergent using a soft cloth or sponge each time after use. Rinse completely with water and store in a dry place.
10. Protect sensors by inserting the Sensor Protection Cap while not in use.

5. Calibration (Salinity)

Performing a Calibration:

1. While calibrating, make sure the sensor does not contact the 35ppt Salinity Standard
2. Solution bottom or sides within the measured sample.
3. Put the sensor part into 35ppt Salinity Standard Solution so that it is immersed fully.
4. Perform a measurement according to the measurement menu.
5. At this time, it is not necessary to calibrate it if the displayed figure is 35ppt.
6. When the displayed figure is not 35ppt, turn the calibration volume with a screwdriver until the displayed figure becomes 35ppt. Confirm with 35ppt Salinity Standard Solution once again after calibration. If the displayed figure does not indicate 35ppt, repeat this operation.

6. Replacement of the Battery

6.1 When to replace the batteries

When the **B** sign appears on the LCD display, your batteries are low and need replacement. Your tester will automatically shut off when battery life is out. Your kit includes (3) replacement batteries (LR44).

6.2 How to replace the batteries

1. Open the cover in the back of the main body and pull out the used batteries.
2. Insert the (3) new battery (LR44) paying attention to the polarity (positive (+), negative (-)). Always replace all (3) batteries at the same time for the best results.
3. Close the cover and turn on power to confirm whether the batteries were replaced correctly.

7. Troubleshooting

Status	Cause	Remedy
LCD display becomes dim or stop working	Low battery life / battery failure	Replace batteries
Unstable measured value	Contamination of sensors	Wash sensors with neutral detergent and rinse w/ water. Dry w/ cloth or tissue
	Salinity or temperature is not homogeneous	Please refer to 4.2 (salinity measurement) and 1.3 (cautions on measuring)

8. Warranty

AB Aqua Medic GmbH warrants for 12 months for material failures. Further claims are excluded. The Warranty is proved by the original purchase invoice.

If your AB Aqua Medic product does not appear to be working correctly or appears to be defective please contact your dealer in the first instance.

Before calling your dealer please ensure you have read and understood the operating instructions. If you have any questions your dealer cannot answer please contact us.

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