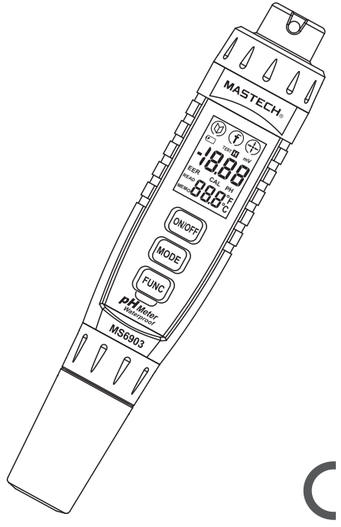
MASTECH® MS6903

DIGITAL CLAMP MULTIMETER
OPERATOR'S INSTRUCTION MANUAL



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1. Product Overview

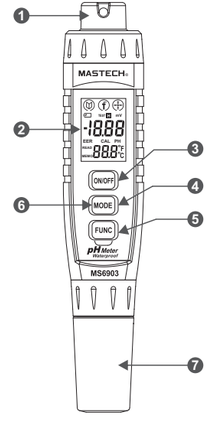
pH tester is a commonly used solution tester, used for precision measurement of a liquid's pH value. A pH=7 means the solution is neutral; pH<7 means solution is acidic and the lower the value, the more acidic the solution is; pH>7 means solution is alkaline and the higher the value, the more alkaline the solution is. The meter is useful for agricultural and industrial production, environmental protection, food science, biology, and other industries. This meter is compact and easy to use.

- PH105-N PH has a composite electrode with a built in pre amp circuit and a low impedance signal output electrode, making the meter more stable in a strong electric field.
- Clear, intuitive display
- Automatic temperature compensation(displays both temp. and pH value)
- Auto calibration, data storage, calibration reminder, low battery display, auto power off
- Easy electrode replacement.
- Reliable waterproof design; can be used in any damp condition
- Lightweight for ease of use.

Notes:

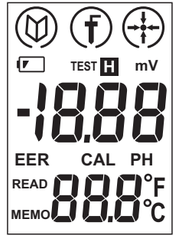
- Operating temperature: 0°~50°C(24°~122°F)
- Avoid dropping to prevent damage to the meter
- Confirm meter is in operating condition before use. Do not use if meter one or more function is not working properly.
- Strong magnetic fields may have some effect on readings.
- Use only specified batteries as outlined in technical specifications.
- Avoid moisture within the battery compartment. Replace batteries if low battery display shows.
- Meter should be calibrated regularly to ensure accurate measurements.

2. Components



1	Battery cover	4	Mode button
2	LCD display	5	Function button
3	Power button	6	PH electrode

2.1 Display Description



1	Ⓜ	Stored data
2	ⓕ	Measurement mode
3	⊕	Calibration mode
4	▭	Low battery indicator
5	READ	Read stored data slot
6	MEMO	Data stored
7	°C°F	Temperature units
8	PH	pH unit
9	TEST	Test indicator
10	H	Data hold

3. Using the meter

1. Installing batteries: unscrew batter cover, install batteries being mindful of polarity, screw battery cover back on making sure it is firmly attached.
2. Press ON/OFF button to turn on meter.
3. The default mode is measurement mode. Pressing MODE will switch between the three modes: ⓜ measurement mode, ⓕ calibration mode, ⊕ read data mode.
4. In measurement mode press FUNC to start pH measurement; TEST will flash to indicate measurement is taking place. Press FUNC to stop measurement and hold the current measurement on screen.
5. While in measurement mode, press and hold FUNC to store the current reading into memory. MEMO will display indicating successful storage along with the memory slot(1-30).
6. Calibration mode: In measurement mode, press MODE to switch to calibration mode. In calibration mode, press FUNC to begin calibration. Once calibration is complete, the meter will automatically switch to measurement mode.

Note 1) During calibration, if the instrument reading and the calibration solution deviation is greater than 1.00pH, the instrument cannot be calibrated. Soak the sensor in a solution of 3.3mol/L of KCL for several hours before calibrating.

Note 2) It may be necessary to restore the instrument to factory setting before calibration if calibration is unsuccessful.

7. Restore Factory settings: Press both MODE and FUNC together and the display will show"---"indicating that the calibration data has been restored to factory settings.
8. Reading stored data: In calibration mode, press MODE to move to stored data mode. Press FUNC to cycle through the stored data slots.
9. Clearing stored data: While powering on the meter, hold the FUNC button and the meter will display "CLR" indicating that all stored data has been cleared.

4. Technical Specifications

	MS6903 Waterproof pen type pH meter
Display	Multifunction LCD
Measuring Range	0.00pH to 14.00pH
Accuracy	±0.03pH(after calibration)
Temp.Compensation Range	0°C to 50°C automatic compensation
Temp. Accuracy	±0.1°C
Temp. Resolution	±0.1°C
Data Storage	Max 30pH values
Power	4x 1.5V LR44 button batteries
Low Battery Indicator	Low battery display on LCD
Auto Power Off	Meter powers off after 10 min
Operating Temp.	0°C to 50°C

Notes:

1. When using the MS6903 pH tester in automatic calibration, you can select one-point, two or three-point calibration. Use three-point calibration for better range and measurement accuracy. If the meter does not recognize the buffer solution, restore the meter to factory default. After restoring if the meter still does not recognize the buffer solution, replace the electrode.
2. Instrument calibration frequency depends on factors such as solutions being tested, electrode performance and measurement accuracy.
3. If the difference between measured value and known calibration solution value is outside your accuracy requirements, calibration should be performed. Other cases when the meter should be calibrated include:

• Using electrodes that have been un-used for an extended period of time or a new electrode.
• After measuring a strong acid(pH<2)or strong alkali (pH>12)
• Measuring a solution containing fluoride or a more concentrated organic solution.

4. The meter's electrode bulb needs to stay damp in order to maintain its accuracy under normal testing. If the electrode remains dry for extended periods of time, the meter will be slow to respond and may provide irregular readings. It is recommended that you keep a damp sponge inside the electrode cap when the meter is not in use.
5. Calibrate new or used electrodes by soaking in a solution of 3.3mol/L of KCL(25g KCL in pure water, dissolved and diluted to 100mL)for several hours. You can also purchase professional electrode soaking solutions.

6. Do not touch the glass electrode bulb to any hard object. Any breakage or foreign substance on the electrode bulb will cause the electrode to fail. Rinse several times to remove any leftover substances after testing viscous liquids.
7. After long term use of the electrode, or testing in solutions that can easily contaminate the bulb, passivation occurs. This can cause the meter to respond slowly and give inaccurate readings. The following can be used to prevent passication:

• Soak electrode in 0.1mol/L HCL(9mL acid diluted in 1000mL water)solution for 24 hours, wash clean with water, then soak in 3.3mol/L KCL solution for 24 hours.
• For more serious passivation, immerse electrode in 4% solution HF(hydrofluoric acid)for 3-5s, wash clean with water, then soak in 3.3mol/L KCL solution for 24 hours.
• For cleaning the bulb/junction, the following solutions can be used:
1) Inorganic metal oxide solution less than 1mol/L acid
2) Organic matter(diluted detergent oils and fats)
3) Resin polymer material(diluted alcohol, acetone, ether)
4) Blood precipitate(acidic protein enzyme solution)
5) Pigment substances(diluted bleach, peroxide)
• The electrode is made up of a polycarbonate shell; do not use cleaning agents such as carbon tetrachloride, trichloroethylene, tetrahydrofuran, acetone, etc. These solutions will cause the electrode to fail.

• Standard electrode life cycle is about 1 year. If used in hard solutions or not properly maintained, life cycle will be shortened. If unable to determine if electrode is still in usable condition, reset the meter to factory settings and measure the pH value of water; if the reading is less than 5.6pH or higher than 8.4pH, replace the electrode.
• Replacing Batteries: when the display shows the "low battery" symbol, batteries need to be replaced to ensure accurate measurements. Unscrew the cap at the top of the meter, remove old batteries and replace with new LR44 button batteries. Screw cap back on and tighten.