



ORP30CR Pen-Type ORP Gradient Meter

Product User Manual



I. Product Overview

This product is a pen-style ORP (oxidation-reduction potential) gradient meter featuring a portable pen-style design that provides long-lasting power with a single 1.5V battery. Through three LED indicators—red, yellow, and green—the product displays the ORP value of the tested solution in graduated levels, allowing users to quickly assess the solution's oxidation-reduction state without needing to take a reading. The device has extremely low standby power consumption and is simple to operate (single-button control), making it widely applicable in aquaculture, swimming pool water quality monitoring, water treatment, laboratory screening, and rapid on-site testing.

II. Technical Parameters

Power Supply Type	1 x 1.5V battery (AAA/No. 7)
Standby Power Consumption	< 20 μ A, quiescent current
Operating Current	< 2 mA
Measurement Range	0 to ± 1000 mV (gradient-scaled display)
Display Type	3 high-brightness LEDs (red / yellow / green)
Instrument Calibration	256 mV and 500 mV (two points), data retained during power loss; press and hold for 3 seconds during calibration to clear
Number of Buttons	1 button (combined power on/off and calibration button)
Auto Shutdown	10 minutes of continuous operation after power-on
Operating Temperature	0°C to 50°C
Instrument Weight	Approx. 106 g (without batteries)

III. Explanation of ORP Gradient Indication

Upon startup, based on the currently measured ORP value, the LED indicator will illuminate according to the following gradient rules, with an accuracy of $\pm 3\%$:

ORP Measured value	Indicator light status	Meaning
< 0 mV	Blinking red lamp	The solution exhibits reducing properties.
0 ~ 500 mV	The red light is constantly lit	Located in the first gradient region

500 ~ 600 mV	The yellow light remains constantly lit	Located in the second gradient region
> 600 mV	The green light remains constantly lit	The solution exhibits strong oxidizing properties.

IV. Operating Instructions

Before first use, insert a 1.5V battery (be sure to observe the positive and negative polarities).

Power On: While the device is off, press the button once briefly to turn it on. The LED will display the current ORP value and enter the gradient indication mode.

Measurement: After powering on, the device continuously monitors the ORP value in real time and updates the display; if the device will not be used for an extended period, please turn it off promptly to conserve battery power.

Power Off: While the device is on, press and hold the button for approximately 2 seconds to turn it off; the device will enter low-power mode (quiescent current <20 μ A). The device will also automatically turn off after 10 minutes of continuous operation. Do not press and hold the button to turn off the device during calibration; see “V. Two-Point Calibration.”

V. Two-Point Calibration

This instrument supports two-point calibration at 256 mV and 500 mV. The calibration results are stored within the instrument, remain valid even after power-off or battery replacement, and are used to determine the gradient across the entire measurement range. The calibration process is indicated by a flashing yellow light.

Calibration Procedure: After powering on the device, press and hold both buttons briefly for two consecutive times within 3 seconds, then hold them down for approximately 3 seconds. During this hold period, the yellow indicator light will flash; once the 3-second duration has elapsed, the device will enter calibration mode. The yellow indicator light will continue to flash after releasing the buttons. If the buttons are released before the full 3 seconds have elapsed, the device will neither enter calibration mode nor shut down.

First point (256 mV): Immerse the electrode in the 256 mV standard solution. If the voltage change does not exceed 8 mV over a continuous 5-second period, the red LED remains continuously lit while the yellow LED continues to flash; if stabilization is not achieved, the red

and yellow LEDs flash synchronously. If the voltage change exceeds 8 mV after the red LED has remained continuously lit, the red LED reverts to flashing. Briefly press the button after the red LED has remained continuously lit to confirm the first point and proceed to the second point.

Second point (500 mV): Immerse the electrode in the 500 mV standard solution. If the voltage change does not exceed 8 mV within 5 consecutive seconds, the green indicator light remains steady while the yellow indicator light continues to flash; if stabilization is not achieved, both the green and yellow indicator lights flash synchronously. If the voltage change exceeds 8 mV after the green light has become steady, the green light reverts to flashing. To submit a command, briefly press the button while the green light is steady; if this condition is not met, the brief press is invalid, the indicator lights revert to flashing, and the operation may be retried once stabilization is achieved again.

Completion: Upon successful saving, the red, yellow, and green indicator lights will flash simultaneously for approximately 2 seconds, after which the system automatically returns to its normal gradient indication.

Calibration Reset: During the calibration process, press and hold the button for approximately 3 seconds. Once the 3-second duration has elapsed, the yellow indicator light will turn off, and the red indicator light will flash rapidly for about 2 seconds; any previously saved calibrations will then be cleared. After this, exit the calibration mode and return to normal measurement. If the button is released before the 3-second duration has elapsed, the calibrations will not be cleared, nor will the device shut down. If the button remains pressed after the red indicator light has stopped flashing, the device will not shut down immediately; instead, it will only shut down after the button is released and held again for approximately 2 seconds.

Stage	Indicator Light	Operation
Full calibration process	The yellow light is flashing	Does not turn off in response to the transition between red and green lights.
The first point is not stable.	The red and yellow lights flash synchronously.	Wait; do not press briefly.
The first point has stabilized.	The red light remains constantly lit, and the yellow light flashes.	Press briefly to confirm: 256 mV

The second point is not stable.	The green and yellow lights flash in synchronization.	Wait; do not press briefly.
The second point has stabilized.	The green light is constantly lit, and the yellow light is flashing.	Press briefly to submit 500 mV
Successfully saved	All three indicator lights flash simultaneously for approximately 2 seconds.	Automatically return to gradient indication
Clear Calibration	Red light flash: approximately 2 seconds	Press and hold for approximately 3 seconds, then clear the data and exit; do not power off the device.

If calibration cannot be completed, it is recommended to replace the electrode and perform calibration again.

VI. Precautions for Use

1. Before measurement, clean the electrodes with purified water and gently wipe them dry with a soft cloth.
2. The measurement terminal of the ORP electrode (platinum needle) should be kept clean, and exposure to impacts or oil contamination should be avoided.
3. The instrument is a gradient-indicating meter, intended solely for range-based judgment; for precise millivolt readings, please use a digital display meter.
4. Do not immerse the entire device in water for extended periods; during measurement, only the electrodes may be in contact with the liquid being tested.
5. Do not measure solutions that are highly corrosive or operate at high temperatures ($>50^{\circ}\text{C}$), to avoid damaging the electrodes.
6. When not in use for an extended period, remove the battery to prevent leakage that could damage the device.
7. If the LED indicator dims or shows abnormal behavior, please replace the battery promptly.

VII. Common Troubleshooting

Symptoms	Solution
The device cannot be powered on by pressing the buttons.	Check whether the battery is properly installed and whether its battery level is sufficient; if a new battery has been replaced, try again.
Indication of instability / drift	The electrodes must be activated or cleaned; then re-calibrate using the standard solutions at 256 mV and 500 mV as specified in Section 5.
All LEDs flash simultaneously	If the battery voltage is too low, please replace the battery immediately.
Second point: No completion prompt appears after a short press.	Confirm that the green light remains steadily lit and that the difference between the solution voltage and 500 mV does not exceed 300 mV.

VIII. Warranty Terms

This product is covered by a one-year free warranty from the date of purchase (excluding damage caused by human error, battery leakage, and normal wear and tear of the electrodes). After the warranty period expires, our company offers paid repair services. Please do not disassemble or repair the product yourself, as doing so will void the warranty.

※ If there are any changes to the content of this manual, no further notice will be given. Please refer to the latest version for accuracy.



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