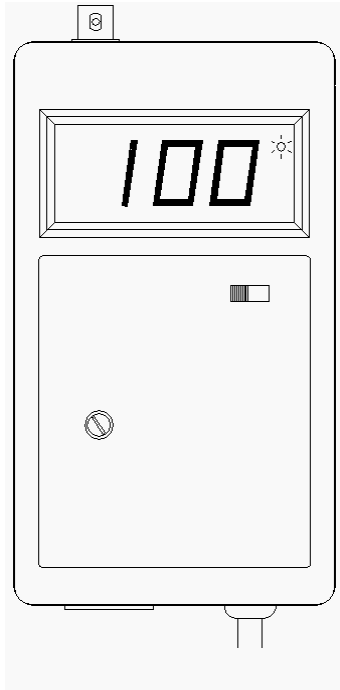


ORP 監控器使用說明書



使用本 ORP 監控器前，請詳細閱讀說明書，正確使用，確保測試值的準確度

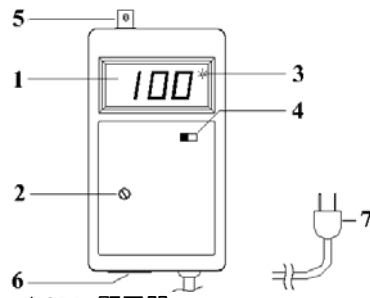
清潔保養

- 1) ORP 電極置於水中不可超過電極帽高度，(如為可填充式電極，置於水中不可超過填充孔高度，以免水進入電極內而損壞)且定期(2~3星期)以軟毛牙刷輕輕清洗感應頭所附著之藻類或雜質，以確保測量的準確性。不用時，電極請置於有3M KCL保存液之封套內，若有結晶乃屬正常現象。
- 2) ORP 電極為一精密之玻璃製品，請勿敲擊，以免內管玻璃破裂損壞。電極請勿用手及布類或酒精擦拭電極前端白金感應頭，以免損壞。
- 3) 本儀器僅供室內使用。

電器規格

電源規格	: AC100-240V 50/60 Hz
消耗功率	: 大約 2 瓦。
顯示器	: 0.56吋 3 1/2 位數，大型 LED 顯示器。
ORP測量範圍	: -1999~+1999mV。
ORP解析度(讀值)	: 1 mV。
ORP精確度(誤差)	: ±(1mV+2 digits 校正後)。
設定控制範圍	: -500~+500mV。
輸入阻抗	: 10 ¹² 歐姆。
外部校正	: 無。
控制方式	: 測量值低於設定值時，啟動控制電源。
控制啟動指示	: LED 亮燈指示。
控制電源規格	: 與使用電源相同電壓之 5 安培容量。
使用溫濕度限制	: 攝氏 0°~50°。濕度低於 90% RH。
外觀尺寸	: 外觀 150 x 85 x 40 mm. (5.9 x 3.4 x 1.6 inch)

監控器名稱說明



- 1) ORP 顯示器
- 2) 設定值調整鈕
- 3) 啟動控制指示燈
- 4) ORP / SET 測量/設定 開關
- 5) ORP 電極 BNC 接頭
- 6) 控制輸出電源插座
- 7) 電源插頭

操作說明

- 1) 依電壓規格指示接上電源。
- 2) 將 ORP 電極裝入ORP 輸入端 (BNC接頭插入後，右轉到底)。
- 3) 將功能開關位置切到 " SET " 設定位置。(此時控制信號自動關閉)
- 4) 調整 SET 的旋鈕，使顯示的數字到達到所需要設定的ORP 值。設定完後請將開關切回 " ORP " 測量位置。(測試值低於設定值時會啟動控制電源)
- 5) 將 ORP電極以蒸餾水稍作清洗後放入所要測量控制的水中。

註：本氧化還原控制器，出廠前已經模擬電極信號校正妥，使用時不需再校正。(如果需要校正，請送回工廠作校正)

備註

- 1) 為保護所控制設備不受頻繁啟動而損壞，設有延遲啟動功能。
- 2) 餵食前、後、白天、晚上及pH值高時都會影響其氧化還原電位高低。

為什麼要測氧化還原電位值ORP

以容易了解的水族觀念來說，氧化還原電位值 ORP 的高或低，代表水中可以氧化掉有毒阿摩尼亞及亞硝酸鹽能力的大小(但同時也會氧化其他物質)! 簡單來說，魚缸污染物質較多時，氧化還原電位值相對較低;魚缸污染物質較低時，氧化還原電位值相對較高。

◎ 一般魚隻飼養缸氧化還原電位可以從 200~500mV(視過濾系統與溶氧效率而定)。

◎ 飼養良好的海水軟體缸：

其氧化還原電位參考值約在 360(早晨:剛開燈)~450mV(傍晚:剛熄燈後及之後一段時間)。

◎ 飼養良好的水草缸：

其氧化還原電位參考值約在 250(早晨:剛開燈)~400mV(傍晚:剛熄燈及之後一段時間)。(魚隻飼養量多時會較低，飼養量少時會較高)

◎ 特別設計使用的除硝酸(denitrification)過濾槽：

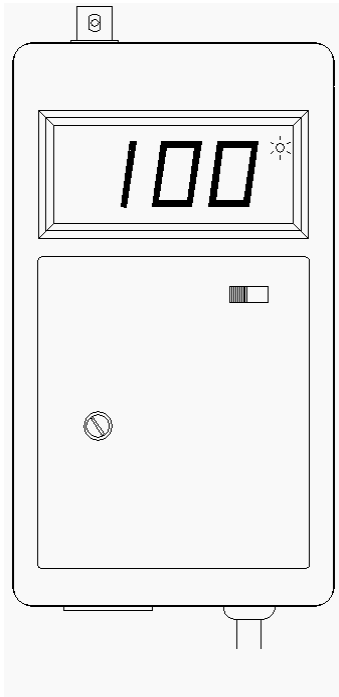
其氧化還原電位參考值約在 -190~50mV (切勿低於 -190，以防過度厭氧反應產生有毒的硫化氫)

污染度較高的水族缸中較常見情形

污染度較高的水族缸中較常見情形是氧化還原電位值過低，而不容易升高。調升水中的氧化還原電位值常見方法可以採用: 使用臭氧機添加臭氧，增加使用蛋白質除沫機，提升水中溶氧效率(如大量有效的滴流過濾、溶氧錐等)，添加ORP調升液等方法。

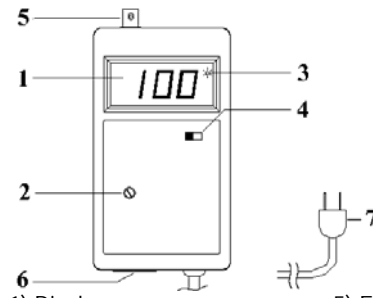
OPERATION MANUAL

ORP CONTROLLER



Please read the attached instructions carefully before use.

FRONT PANEL DESCRIPTION



- 1) Display
- 2) SET Adjustment knob
- 3) Indicator of output in action
- 4) ORP / SET function switch
- 5) Electrode BNC input terminal
- 6) Control output socket
- 7) AC power plug

OPERATING

- 1) Connecting AC power supply.
- 2) Connecting the ORP electrode into the input terminal socket.
- 3) Slide the ORP/SET switch to "SET" position. (Now the control output will automatic turn off)
- 4) Adjust the "SET" knob until the display reading exact your requirement. Then slide the "ORP/SET" switch to "ORP" position for measuring. Put the ORP electrode into the water what you want to measuring.
- 5) The ORP reading should wait for 2-3 days while the display reading is exact. The ORP reading will be changed after feeding or in the morning and night. We usually control the O₃ generator to raise the ORP value.

REMARK: It does not necessary to calibrating the ORP electrode. If it must to calibrating, please contact the qualifier person only.

CLEANING AND MAINTENANCE

- 1) The immersed level for electrode should not be higher than the electrode cap. (When use the refillable electrode, the level should be lower than filling open to avoid the water entering into the open and cause damage.) It had better cleaning the ORP electrode sensor with soft brush every 2-3 weeks to keep the test accuracy. Please keep the electrode in the storage bottle with 3M KCL buffer solution; the crystallization is normal for the keeping.
- 2) ORP electrode is accurate glass product, please do not knock it, and do not use finger, cloth and alcohol to clean it to avoid the damage.
- 3) There is protection "dead band" for delaying output control in "turn on" and "turn off" to avoid frequent switching.
- 4) Indoor uses only.

GENERAL SPECIFICATION

Power Supply	: AC100V ~ AC240V 50/60 Hz
Power Consumption	: Approx. 2 watts.
Display	: 0.56" LED.
Measurement	: -1999 to +1999 mV
Resolution	: 1 mV.
Accuracy at 25°C	: ±(1 mV+ 2 digits) after calibrating.
Impedance	: 10 ¹² ohms.
Calibration Knob	: None external.
Relay Contact	: 5A for power supply voltage
Control Range	: -500 to +500 mV
Control Output Voltage	: Same as plug in AC voltage.
Temperature	: 0 to 50°C (32 to 122°F).
Operating Humidity	: Max. 90% RH.
Dimension	: 150 x 85 x 40 mm (5.9 x 3.4 x 1.6 inch).

WHY SHOULD WE KNOW ORP (Oxidation

Reduction Potential) RANGE

To realize it by easy understanding aquarium concepts, The high or low value of ORP shows higher or lower capacity which can oxidize toxic ammonia and nitrite in water(but also oxidize the other materials in water)! In short, more pollutants in fish tank, ORP value is relative lower; and is often higher for less pollutant situation.

☉A well keeping coral reef aquarium

The reference reading of ORP could be between 360 (just lighted up) and 450mV (duration of switching light off)

☉ A well keeping freshwater plant aquarium

The reference reading of ORP could be between 250 (morning or just turn the light up) and 400mV or even higher (evening or just turn the light off), (normally the higher ORP reading shows for lower fish population, and the lower reading shows for higher population.)

☉The denitrifying reaction chamber or filter.

The reference reading of ORP should be between -190 and 50mV. (to avoid produce the poisonous hydrogen sulfide in over reduction, the ORP value should not be below -190mV)

THE COMMON SITUATION IN HIGHER

POLLUTED AQUARIUM

The common situation is lower ORP value in higher polluted aquarium and the value is not easy to be shifted up. The common ways to take to shift the ORP value up: Use ozone generator, protein skimmer, effective trickle filter or oxygen tower to increase the dissolved oxygen in water, add additives to increase the oxidation potentials