

Quick-Start Guide

VWQS-ORP01 Verge ORP Sensor

An Oxidation-Reduction Potential sensor from Verge Solutions, referred to as ORP. ORP is often used to indicate the relative degree of oxidation and reduction of environmental media (natural water, culture medium, soil, etc.).

The unit of ORP is mV. It consists of ORP composite electrode and mV (millivolt) meter. The ORP composite electrode consists of an electrode that can absorb or release electrons on the surface of its sensitive layer. The sensitive layer is an inert metal, usually made of platinum and gold, and is like the reference electrode (the same silver/pH electrode as the pH electrode). Silver chloride electrode composition.

The ORP sensor is digital and outputs Modbus, it has IP68 waterproof protection, it is affordable and has high performance. It has long life and high reliability. It has high-quality low-noise cable.

It is simple to calibrate and is part of the Verge Sonde system, allowing for periodic automatic sensor cleaning. Sensor could be utilized alone or part of Sonde.

Parameter	ORP
Units	mV
Range	-1999 to +1999
Resolution	1
Accuracy	+/-1mV
Protocol	RS485 Modbus
Temperature Limits	+5 to 45 degC
Voltage supply	8-24 VDC
Housing Materials	Acetal
Cable Materials	Rubber
Cable Length	5m
Modbus Address (Adjustable)	15(DEC)
Wire colours	Red: V+, Black: V-, Yellow or White: Modbus A, Green: Modbus B

Modbus details

Waketime – needs to be equal to setting of the sensor with the longest waketime.

```
"waketime": 5000
},
"serial": {
  "log_en": true,
  "parity": "8N1",
  "baud": "9600",
  "type": "RS485",
  "device_type": "MODBUS_RTU",
  "mb": {
    "r1": {
      "addr": 15,
      "byte_order": "DCBA",
      "data_type": "UINT16",
      "funct": "HOLDING_REG",
      "name": "ORP",
      "offset": 0.000,
      "reg": 0,
      "scaling": 1.000,
      "units": "mV"
    }
  }
}
```


0X01	0X03	0X00	0X00	0X00	0X01	0X84	0X0A
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If the transmitter receives correctly, return the following data, slave → host

Address	Function code	Data length	Register 0 data high	Register 0 data low	CRC16 low	CRC16 high
0X01	0X03	0X02	0X03	0X78	0XB8	0X96
			ORP Value			

Data representation method:

Data representation method: Convert the data to decimal, and use the complement for negative numbers

The above data indicates that ORP: 888mV

3. Make the calibration by the instruction

Add 32mV in the (address 1) (ORP value), host → slave

Address	Function code	Start register address high	Start register address low	Register length high	Register length low	CRC16 low	CRC16 high
0X01	0X06	0X00	0X0A	0X00	0X20	0XA8	0X10

If the transmitter receives correctly, it will return the 01 06 00 0A 00 20 A8 10.

Instructions:

1. Sampling: Take a representative water sample according to sampling requirements.
2. Determine the ORP of the water sample: first rinse the electrode three times with distilled water, then rinse three times with the water sample, then immerse the electrode in the sample, shake the test cup carefully or stir to accelerate the electrode balance, leave it to stand, and record it when the reading is stable ORP.

3. If it is inconvenient to sample, you can also put the electrode into the solution to be tested. After the measured data is stable, read the output data. After a period of time, take out the electrode and clean it.

4. After the sample is measured, rinse the electrode three times with distilled water, and put the electrode back in the protective solution.

Note: When measuring multiple samples, the electrode should be cleaned before measuring the next sample to avoid affecting the experimental data.

Precautions for use

1. Please check whether the packaging is intact, and check whether the product model is consistent with the selection.
2. Do not electrify the wiring, the wiring is completed, and the power can be turned on after checking.
3. Do not arbitrarily change the components or wires that have been soldered at the time of shipment.
4. The sensor is a precision device, please do not disassemble it yourself, and use sharp objects or corrosive liquid to touch the sensor surface to avoid damage to the product.