

Technical Datasheet

LIQUID ANALYSIS MEASUREMENTS | DATA SHEETS | DS-WK100-EN- REV.A-23

PH /ORP - Transmitter / Controller WK100



pH | ORP | TDS | CONDUCTIVITY | DO | TURBIDITY | TSS | BOD | COD

Measurement made easy

The low-power, high-performance transmitter

Modular design for strategic flexibility

- common universal design for analog pH, ORP, conductivity and digital
- plug-and-play sensor and communication modules minimize stock holding and maximize operation uptime
- wall-, panel- or pipe-mountable

Easy to use

- 'Easy Setup' sensor configuration menus provide step-by-step guidance
- multi-level security access prevents unauthorized modifications to transmitter configuration and calibration
- One-Button sensor calibration saves time and money spent on routine maintenance

Robust and reliable

- available in both corrosion-resistant polycarbonate or durable aluminium enclosures



Features

- Easy operation
- Enclosure for field mounting and panel mounting
- Automatically Temperature Compensation
- Directly switchable to PH or ORP ·
- Large LCD display with background lighting
- PH or ORP sensors can be connected
- Using the setup program: user-friendly
- Programming 4-20mA analog output
- RS485 communication-MODBUS-RTU
- Relay output

WK-100 pH/ORP Transmitter is a true multi-variable analyzer used for measuring/controlling the pH with temperature and ORP (The function is switchable on the device itself). Depending on the measured variable, combination electrodes (e. g. pH sensors) or split versions (glass electrodes with a separate reference electrode) can be readily connected. Truly unique is the pH meter in the Human Machine Interface. The high resolution digital display and LCD screen make the measurements are clearly legible and the keyboard operation make it easier for the user to configure the device. The instructions on screen assure that the best configuration for the application is obtained. Universal application in water and waste water engineering, service/process water and drinking water and well/surface water, leakage monitoring in refrigeration plant

Product Description

The device is designed for use on site. A rugged housing protects the electronics and the electrical connections from corrosive environmental conditions . As an alternative, the device can also be installed in a control panel.

Instructions

The instructions on screen assure that the best configuration for the application is obtained. Universal application in water and waste water engineering, service/process water and drinking water and well/surface water, leakage monitoring in refrigeration plant

Why you need to calibrate:

The characteristic of a pH electrode will change with time due to electrode coating and aging. And even a pH electrode would be stable over time, pH electrodes cannot be produced with identical characteristics. In practice the response of a real pH sensor does not exactly follow the Nernst equation. This difference between the theoretical and actual behavior of a pH electrode must be compensated for. A calibration is required to match the pH meter to the current characteristics of the used pH sensor.

Multi-point calibration

To achieve the best possible accuracy, the calibration should cover the range of the desired measurement values. If the readings go beyond the calibrated range, the pH meter assumes linearity and simply extrapolates the value to be displayed. The true value may be slightly different. More advanced pH meters will let the user calibrate at three, four or five and even higher numbers of pH values. A multi-point calibration mean, in comparison to a two-point calibration, that you can calibrate your pH tester on both sides of the zero point (pH 7.00). This will expand your pH measurement range without the need of re-calibrating.

Wellkonix designs, manufactures, and tests its Analytical products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use, and maintain them to ensure they continue to operate within their normal specifications. safety program when installing, using, and maintaining Rosemount Analytical products.



ORP Measurement Basics For The Process Industry

The ability of a medium to oxidise or reduce another medium is measured by its “oxidation-reduction potential,” or ORP.

When an oxidizer takes an electron from another molecule, it is said to be oxidising, and when a reducer gives an electron to another molecule, it is said to be reducing. A single mV value, which can be positive or negative, can be monitored by an ORP sensor to identify whether oxidation or reduction is taking place. The mV value is positive when a medium is oxidising. The mV reading will be negative when it is displaying reduction. Additionally, an ORP measurement known as “Redox” is frequently used. Reduction and oxidation are combined to form the word redox.

Creating ORP Sensors

Both an ORP electrode and a reference electrode are parts of an ORP sensor. When considering the design of an ORP sensor, the transfer of electrons is crucial. Platinum, which is frequently used in ORP electrode fabrication, has low resistance. The electrode is able to exchange electrons with both oxidizers and reducers. Until a potential is formed, the electrode will continue to take or release electrons. After then, it produces millivolts. The reference electrode in an ORP sensor is commonly constructed of Ag/AgCl and submerged in a KCl reference substance, making it very similar to a pH reference electrode.

Using the ORP Measurement to Interpret

Chemical media that act as oxidizers or reducers come in a wide variety. Instead of receiving a precise indication of the chemical you are measuring when monitoring ORP, you instead receive a signal that an oxidizer or reducer is present. For instance, ORP sensors are frequently used in Pulp and Paper mills to regulate the injection of chlorine, which is employed as a disinfectant in the mill. A measurement of ORP is one that can only be inferred. However, when done appropriately and in conjunction with knowledge of the process medium being studied, ORP measurements can be a useful tool for detecting specific compounds in a processing environment.

Summary

In process applications across many sectors where managing chemical compositions is crucial, we deploy ORP sensors. You may control the process in an effective and efficient manner by grasping the fundamentals of ORP measures.





Technical specifications

Measurement Performance

PH

Measure Range	PH(0-14)
Resolution	PH: 0.01
Stability	PH: 0.02PH/24H;
Accuracy	PH: 0.02PH;
Input impedance	10 ¹²

ORP

ORP(-1000~+1000Mv)
ORP: 1Mv
ORP: 3Mv/24H
ORP:1Mv

Temperature compensation	NTC 10K or PT1000 -10-130 Deg.Cel.
Power Supply	AC220V +-10%, 50Hz or DC 24V

Output Signal

Communication	RS485, MODBUS-RTU
Transmission signals	4-20 mA
Process alarm	High/Low process alarms, selected from pH
Relay output	AC250V, 3A (2 Relay)

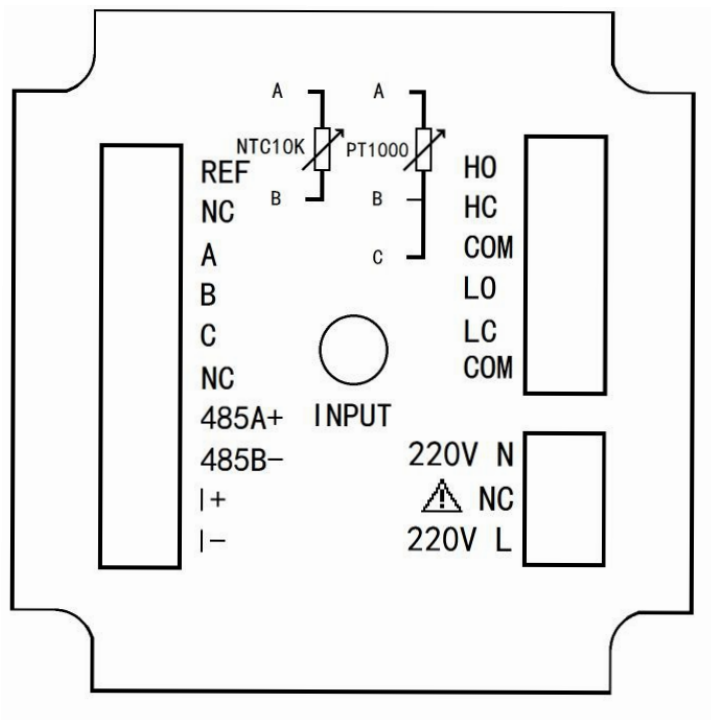
Other

Panel Front Size (mm)	96(W) x 96(H) x Approx.112 (D)
Panel Cutout Size (mm)	92(W) x 92(H) x Approx.112 (D)
Converter weight	Approx. 1 kg
Display	LCD with back lights in English
Calibration	Semi-automatic 3 points calibration using pre-configured buffer tables 4, 7& 10, or 4, 6.18& 9.18
Color	Black
Ambient temperature	-20 to +55°C (-5 - 130 °F)
Storage temperature	-30 to +70°C (-20 - 160 °F).
Humidity	10 to 90% RH at 40°C (100 °F)

Wiring

Identification of Terminal

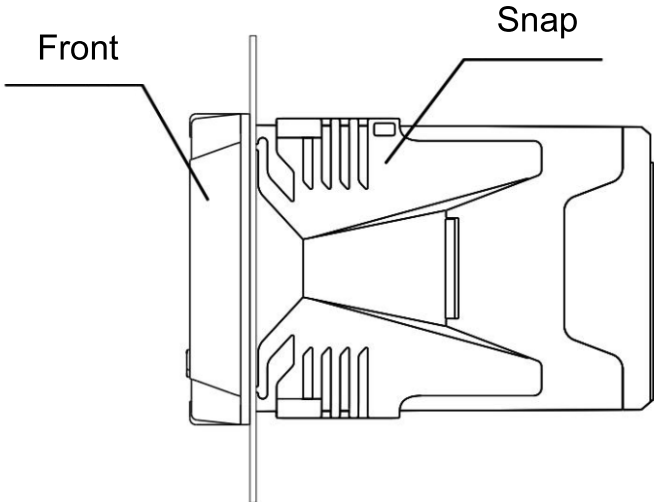
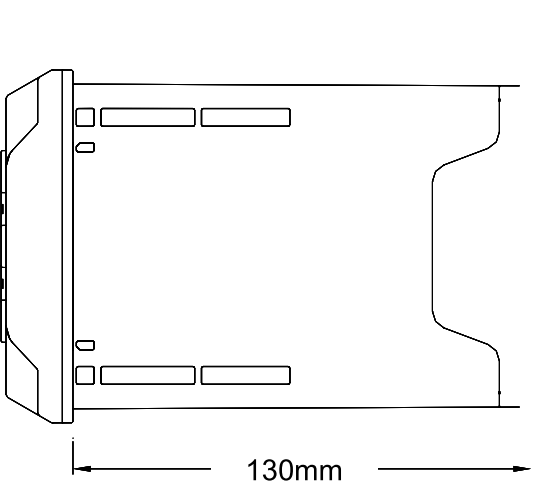
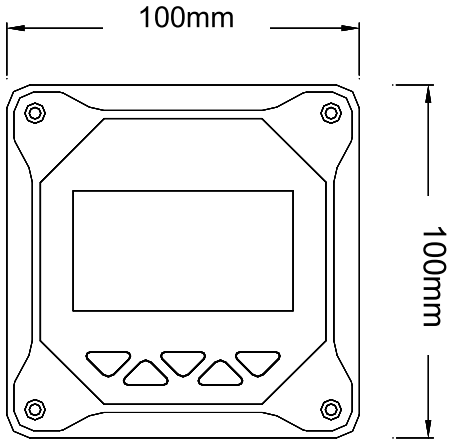
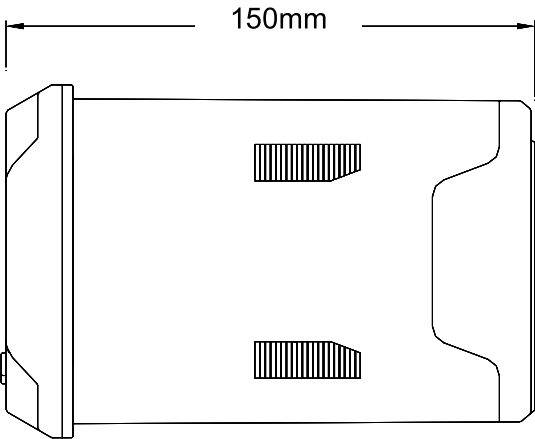
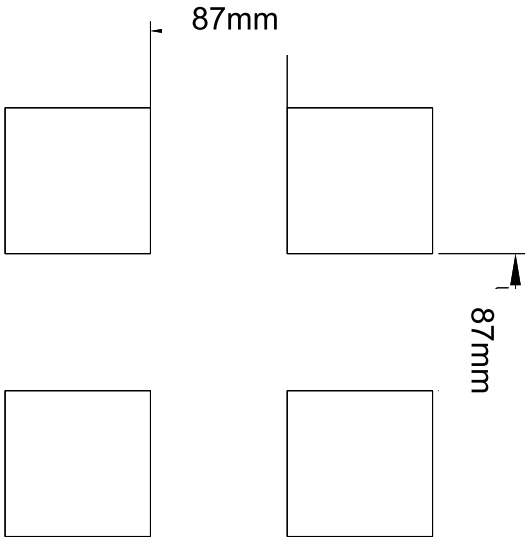
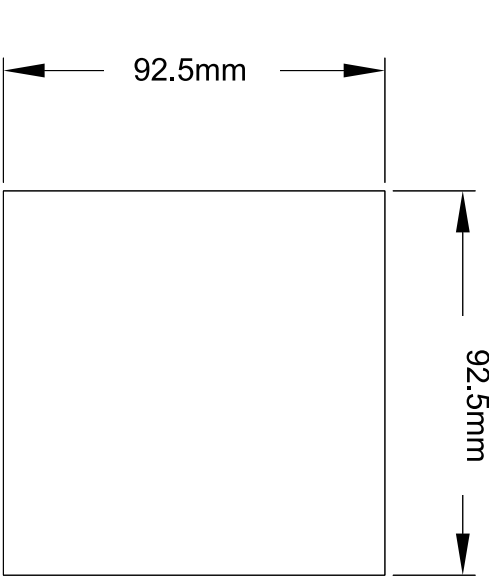
INPUT	Measuring terminal of the electrode
REF	Reference terminal of the electrode
A	Temperature compensation terminal A,NTC10K and PT1000 connect here
B	Temperature compensation terminal B,NTC10K and PT1000 connect here
C	Temperature compensation terminal C, PT1000 three-wire temperaturegrounding, PT1000 two-wire need to be short-connected to TEMPB, notNTC10K.
NC	Unidentified
RS485 (A +)	RS485 communication interface B-
RS485 (B -)	Reference terminal of the electrode
4-20mA (+)	4-20mA output end+compensation terminal A,NTC10K and PT1000 connect here
COM	common
4-20mA (-)	4-20mA output end
AC220V (L)	AC220V Fire Wire
AC220V (N)	AC220V zero line
HO	high alarm normally open relay
HC	high alarm normally closed relay
LO	low alarm normally open relay
LC	low alarm normally closed relay



Wiring diagram

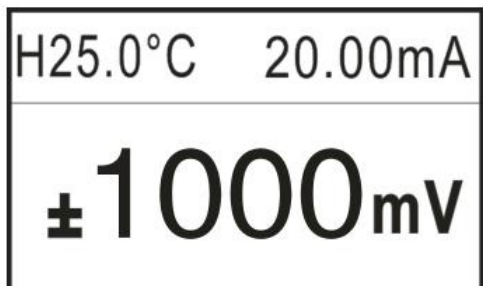
Dimension

(Dimensions in mm)



Display

ORP Monitor



Why you need to calibrate:

The characteristic of a pH electrode will change with time due to electrode clogging and aging. And even a pH electrode would be stable over time, pH electrode cannot be produced with identical characteristics. In practice the response of pH sensor does not exactly follow the Nernst equation. This difference between the theoretical and actual behavior of a pH electrode must be compensated. Calibration is required to match the pH meter to the current characteristics of the used pH sensor.

pH Calibration:

Enter the pH calibration screen, the first pH electrode into the 4.00 pH standard solution, standing for a moment, to be stable after the show, press the ENT, then the pH electrode into the 6.86 pH standard solution. Set the pH electrode into the 9.18 pH standard solution, put it aside for a moment, after the test is stable, press ENT, the display shows the success of the calibration, the whole process of pH calibration completes.

pH Modification:

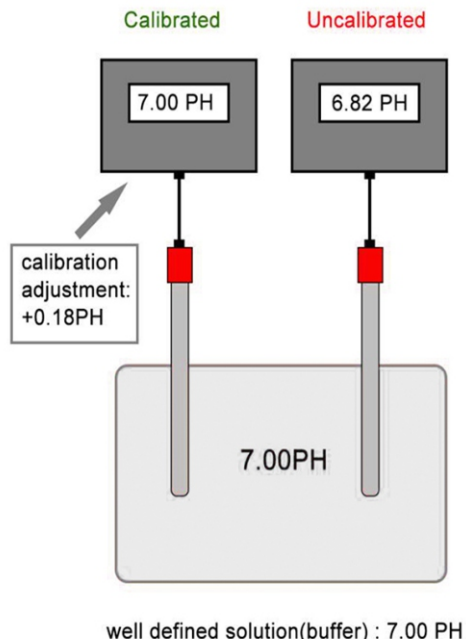
The measured pH can be modified between 2 pH values.

ORP Calibration:

Enter the ORP calibration screen, the first ORP electrode into the 86 mV standard solution, standing for a moment, to be shown after the stability, press the ENT, then the ORP electrode into the 256 mV standard solution, static. Set a moment, after the display is stable, press the ENT display calibration is successful, ORP calibration process is over.

ORP Modification:

The measured ORP can be modified between 300 mV. Temperature correction: You can correct the temperature of the automatic temperature compensation, the correction range is ± 20.0.



----- Main Menu -----

- ➡ 1. System Setting
- 2. Signal Setting
- 3. Online Calibration
- 4. Remote Setting
- 5. Alarm Setting
- 6. Information Inquiry

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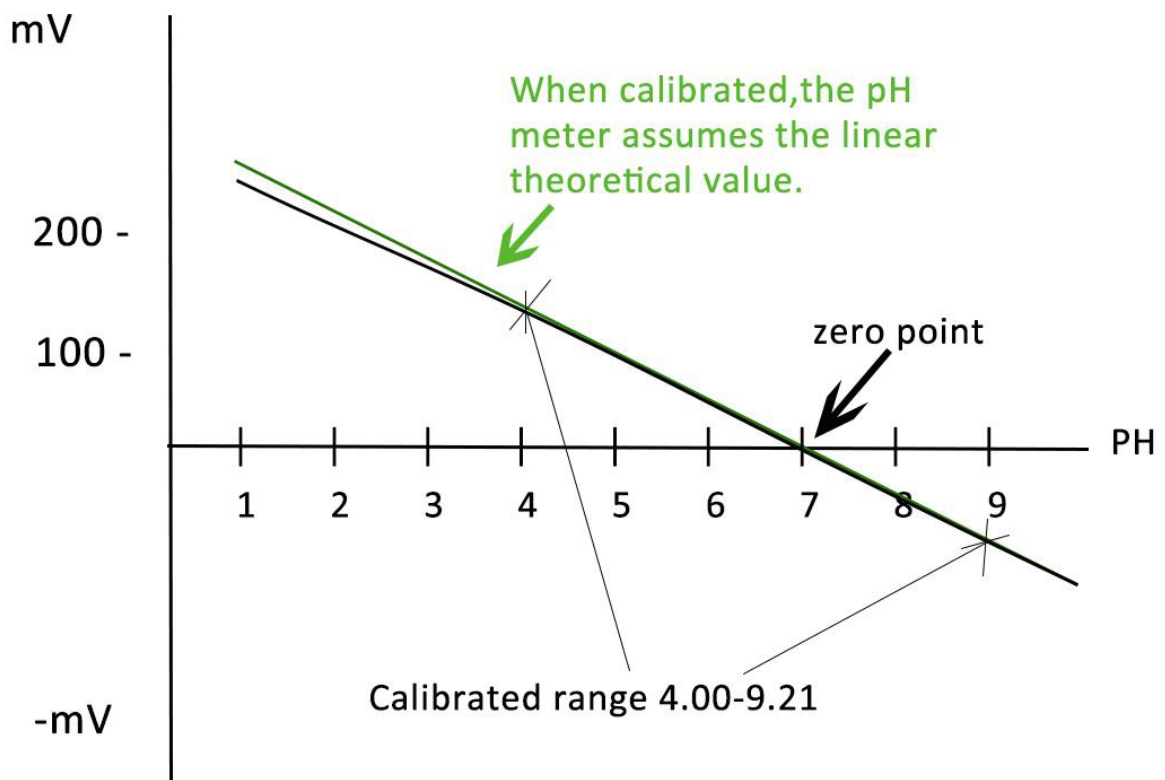
----- Online Calibration -----

- ➡ 1. PH Calibration
- 2. PH Modification
- 3. ORP Calibration
- 4. ORP Modification

Multi-point calibration

To achieve the best possible accuracy, the calibration should cover the range of the desired measurement values. If the readings go beyond the calibrated range, the pH meter assumes linearity and simply extrapolates the value to be displayed. The true value may be slightly different. More advanced pH meters will let the user calibrate at three, four or five and even higher numbers of pH values. A multi-point calibration means, in comparison to a two-point calibration, that you can calibrate your pH tester on both sides of the zero point (pH 7.00). This will expand your pH measurement range without the need of recalibrating

Example) Three-point calibration at pH 4.00, 7.0 and 9.21



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