ScichemTech-USA

SCT-108.005.06

SCT-pH-MINI VERTICAL
ScichemTech pH MINI Controller
User/Operational Manual


ScichemTech®
9.06
HIGH LOW
SET
ENT
SCT-PH-MINI-V

MANUAL INDEX PAGE

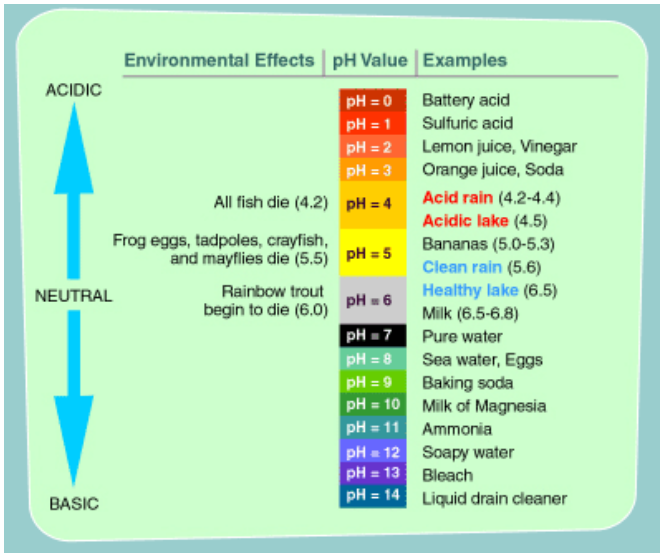
I. MODEL AND INSTRUMENT TYPE

Thank you for purchasing and selecting Our SCT- Product Number: SCT-108.005.06
Model: SCT-PH-MINI – The online pH Controller.
Once again we thank you for choosing our Model: SCT-PH-MINI – The online pH Controller for your pH related field applications. We are pretty sure that you will be happy with our Instruments…Please feel free to contact our dealers /service team for any further assistance.

II: PRINCIPLE & OPERATIONS:

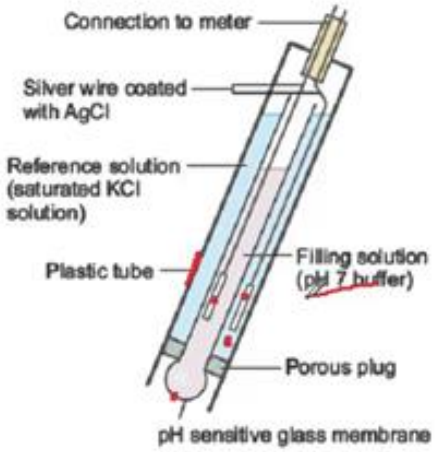
In the process world, pH is an important parameter to be measured and controlled.

A pH Controller provides a value as to how acidic or alkaline a liquid is. The basic principle of the pH controller is to measure the concentration of hydrogen ions. Acids dissolve in water forming positively charged hydrogen ions (H+). The greater this concentration of hydrogen ions, the stronger the acid is. Similarly alkali or bases dissolve in water forming negatively charged hydrogen ions (OH-). The stronger a base is the higher the concentration of negatively charged hydrogen ions there are. The amount of these hydrogen ions present solution is dissolved in some amount of water determines the pH.



A pH value of 7 indicates a neutral solution. Pure water should have a pH value of 7. Now pH values less than 7 indicate an acidic solution while a pH value greater than 7 will indicate an alkaline solution. A solution with pH value of 1 is highly acidic and a solution of pH value of 14 is highly alkaline.

A pH measurement loop is made up of three components, the pH sensor, which includes a measuring electrode, a reference electrode, and a temperature sensor; a preamplifier; and an analyzer or transmitter. The design and operational theory of pH electrodes is a very complex subject, explored only briefly here. What is important to understand is that these two electrodes generate a voltage directly proportional to the pH of the solution. At a pH of 7 (neutral), the electrodes will produce 0 volts between them. At a low pH (acid) a voltage will be developed of one polarity, and at a high pH (caustic) a voltage will be developed of the opposite polarity.



When immersed in the solution, the reference electrode potential does not change with the changing hydrogen ion concentration. A solution in the reference electrode also makes contact with the sample solution and the measuring electrode through a junction, completing the circuit. Output of the measuring electrode changes with temperature (even though the process remains at a constant pH), so a temperature sensor is necessary to correct for this change in output.

Calibration: To ensure accurate measurements from your pH Controller the controller will need to be calibrated both before it first use and on an ongoing basis. This is usually done by dipping the probe into a buffer solution of a known pH and following the calibration steps based on our specific pH Controller.

III: About the Product & Applications:

Our SCT- Product Number: ***108.005.06***

Model: ***SCT-MINI PH Controller.***

Is a very reliable, accurate and consistent instrument you can always rely upon the Controller for all you Water PH control related applications within it's measuring range.

Salient Features:

- SCT –pH MINI online pH controller is an accurate instrument used for Industrial online measurement and pH control
- Simple and compact design
- meets all the international standards
- Easy to Install, Operates safely with less maintenance
- Output – Insulated 4- 20 mA
- Large and Clear LCD Display
- In line measurement and control of pH values
- pH electrode Supplied with standard 10 meter cable

Applications of SCT-MINI pH Vertical Controller.

SCT-MINI pH Controllers are designed for the measurement and control of industrial on-line pH, widely used in the RO (Reverse Osmosis) Panels for the measurement and control of the water. In the Water purification plants, Production plants of pure water in pharmaceutical industries, chemical industry, electronic industry, foodstuffs, beverage and etc.

However, SCT-108.005.06 can be used in many other fields & applications too.

III. TECHNICAL SPECIFICATIONS

Of Our SCT- Product Number: SCT-108.005.06
Model: SCT-PH-MINI – The online pH Controller has the following Specifications

Measurement range:	pH: 0.00~14.00 pH
Accuracy:	pH: ±0.1 pH
Display mode:	3½ bit LCD with backlit
pH calibration method:	Three-points calibration(4.01,7.00,10.01)
pH temperature compensation:	Manual compensation with 25℃ as the benchmark.
Output current:	Isolate the active output of 4~20mA.
Output control:	Dual-contact output with both higher and lower limits (normally-open and normally-close respectively)
Contact capacity:	7A/250V AC (resistive load)
Length of the cable:	10m or an agreed length of ___m
Screw size:	3/4" pipe thread
Requirements on water samples:	pressure: ≤0.3MPa Flow rate: ≤3 m/s
Power supply:	AC 220V±10%; 50Hz
Environnemental conditions:	Température: 0~50℃ Humidity: ≤85%RH
Overall dimension:	83×53×93mm (height x width x depth)
Dimension of the hole:	74×43mm
Installation method:	panel-mounted

IV: UN-PACKING & PRE-INSTALLATION REQUIREMENTS:

Follow these steps after receiving the instrument:

- Please check carefully the packaging box of the Controller before removing it in order to find out transportation damages.
- Should the packaging box be broken or have suffered any other damage, please contact the shipping agency before opening it.
- Once you have taken the instrument out of the box, check if damages can be observed. Should this be the case, please inform the dealer that has delivered you the equipment.

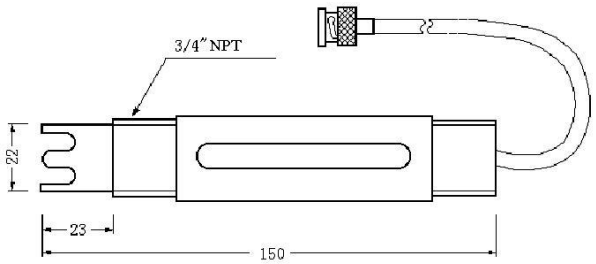
- Remove all packing straps, protectors and accessories used during transport. Recyclable materials are to be disposed in the containers provided therefore.
- Make sure to pre-warm or run the controller for 30-35 minutes prior to using and performing the calibration work
- Also, please make sure all the Electrical connections and the probes are connected properly.
- The meter should be installed in a clean, dry, well ventilated, vibration-free location around should be no corrosive gases.

Temperature changes in the measured liquid affect both the response of the measurement electrode to a given pH level (ideally at 59 Mv per pH unit), and the actual pH of the liquid. Temperature measurement devices can be inserted into the liquid, and the signals from those devices used to compensate for the effect of temperature on pH measurement, but this will only compensate for the measurement electrode's mV/pH response, not the actual pH change of the process liquid!

V. INSTALLATION & METHOD OF OPERATIONS

- **5.1. Main installation**
- As we mentioned earlier, the meter should be installed in a clean, dry, well ventilated, vibration-free location around should be no corrosive gases. Make a rectangular cut out in the instrument cabinet or panel installation. Using the locking tools fix the Controller firmly into the Panel or Cabinet.

- **5.2. Electrode installation**
- pH electrode loaded in to the flow cell is shown in Fig. Such as the use of sinking into the (insertion) type installation, an electrode without the flow measuring chamber, directly, respectively, pH electrode is connected to the connecting rod (water) to prevent the electrode cable can be fixed after inserted into the water, with the fixing bracket. Before installation, be sure to use the raw material with the (threaded Department) good waterproof closed. The measured media should be kept online monitoring and constant minimum flow rate of 15cm^3/S.

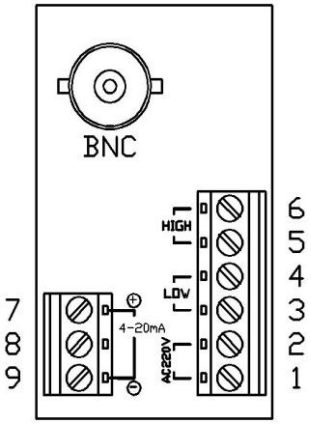


The measuring electrode is a kind of compound electrode with plastic housing with 3/4" NPT

pipe thread joint.

5.3. INSTALLATION OF THE pH CONTROLLER

5.1 Back cover plate



The back cover plate

Description:

1. Alternating current 200V(L) 2. Alternating current 200V(N)
3. Normally open terminal of the low limit control relay
4. Normally open terminal of the low limit control relay
5. Normally open terminal of the high limit control relay
6. Normally open terminal of the high limit control relay
7. Positive output of 4-20 mA 9. negative output of 4-20 mA

5.4. CONTROLLER OPERATION

5.4.1 Keyboard

SET Selector key for the function menu

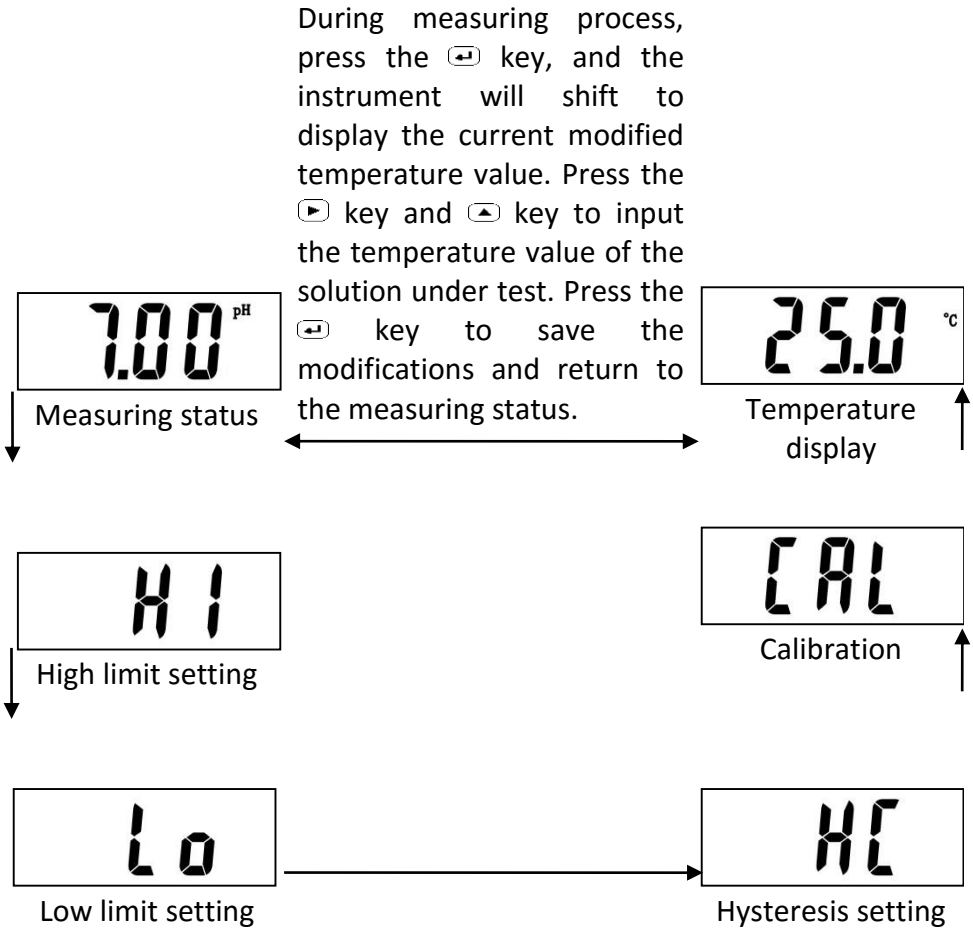
> Left arrow key

^ Multiply key

ENT Enter key

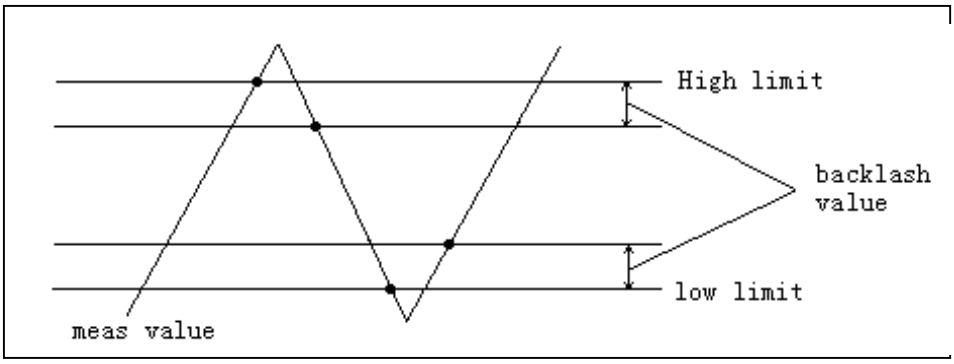
5.4.2 Instrument operation

5.4.2.1 pH operation menu:



Instructions: Keep pressing the SET key, and the "Set" options of the instrument will shift among the above statuses. Press ENT the key, and the instrument will enter into the set menu. Press the > and ^ keys to modify the value to be set. Finally, press the ENT key to save the set data.

Note: 1. After the setting of an option, it is necessary to press the ↺ key to save the required data. Then the set values will stop flickering!
2. The high or low limit can be set within the whole range. However, the high limit must be greater than the low limit.



The hysteresis range of the upper and lower limits

VI. CALIBRATION OF THE pH CONTROLLER

Calibration is to ensure accurate measurements from your pH Controller .The controller will need to be calibrated both before its first use and on an ongoing basis. This is usually done by dipping the probe into a buffer solution of a known pH and following the calibration steps based on our specific pH Controller.

Three-point calibration should be adopted. During the calibration process, three kinds of pH buffer solution will be automatically identified.
Before calibration, prepare three kinds of buffer solution with pH values of 4.01, 7.00 and 10.01 respectively according to the requirements. Before calibration, the electrode should be dipped into clean water or the test solution for 5 minutes.

The calibration method is as follows: (under the measuring status)

(1) Press the SET key until the instrument displays “CAL”, which indicates that the instrument enters into the calibration status.
(2) Press the ENT key, and the instrument will display “C1”. Then insert the cleaned electrode into the first kind of calibration liquid and wait for 3-5 minutes. Press the ENT key until the instrument display shifts from “C1” to “C2”. Fetch the electrode out of the first kind of calibration liquid and wash it. (Strictly follow the required operation sequence.)
(3) Insert the electrode into the second kind of calibration liquid and wait for 3-5 minutes. Press the ENT key until the instrument display shifts from “C2” to “C3”. Fetch the electrode out of the second kind of calibration liquid and wash it.
(4) Insert the electrode into the third kind of calibration liquid and wait for 3-5 minutes. Press the ENT key until the instrument display shifts from “C3” to “temperature value”. Fetch the electrode out of the third kind of calibration liquid and wash it.
(5) If the calibration fails, flickering “E-1” will be displayed on the instrument. At this time, press the SET key, the instrument will exit the calibration status and return to the measuring status. If the instrument needs to be calibrated again, it is necessary to check the buffer solution and the electrode contact. Then press the ENT key, and the instrument will display “C1”. Repeat step (2)-(4).
(6) If the calibration is passed, the instrument display will shift to the previously calibrated temperature value. Measure the temperature of the calibration solution for the present calibration with a Digital thermometer. Then press the > key and the ^ key to input the

measured temperature into the instrument.
(7) Press the ENT key to return to the measuring status.
(8) The present solution into the instrument. The sensors should be put into corresponding standard solutions so as to recheck whether the calibration result is in line with the requirements. If the results are not in conformity with the standard pH value, Pls contact your local dealer or Manufacturer.

VII: PRECAUTIONS & MAINTANANCE:

Maintenance:

1) The electrode cannot be stored in dry environment. When it is not in use, it is necessary to wash it with clean water and insert it in the liquid jacket filled with 1mo1KCL, or insert it in a container filled with 1mo1KCL.
2) The electrode should be cleaned on a regular basis. If the glass bulb of the electrode contacts and is contaminated by the polyfluortetraethylene liquid it should be cleaned with the following reagents.

1. Surfactant can be used to clean oil, grease or oil-containing substance.
2. 10% diluted hydrochloric acid can be used to remove calcium deposit or metal hydroxides.
3.10% diluted hydrochloric acid can be used to remove sulphide precipitation. Protein attachment can be removed by a mixture of 10% diluted hydrochloric acid and pepsin.

In order to ensure that the results of the electrode measurement can reflect the actual situation, the electrode chamber should have no air bubble or stagnant water that may cause measurement errors. Install the measuring electrode according to the following diagram:

Note:
1. The measuring electrode should be installed at a location in the pipeline where the flow rate is stable and air bubbles will not gather easily.
2. The measuring electrode should go deep into the flowing water. The pH signal is a kind of feeble potential signal. The cables for collecting pH signals should be installed independently instead of being laid in the same protection tube with the power cable and the control cable, so as to prevent any possible disturbance.

pH ELECTRODE / PROBE MAINTENANCE

A system's pH electrodes require periodic maintenance to clean and calibrate them. The length of time between cleaning and calibration depends on process conditions and the user's accuracy and stability expectations. Overtime, electrical properties of the measuring and reference electrode change. Calibration in known-value pH solutions called buffers will correct for some of these changes. Cleaning of the measuring sensor and reference junction will also help. However, just as batteries have a limited life, a pH electrode's lifetime is also finite. Even in the "friendliest" environments, pH electrodes have to be replaced eventually.

1. As the measuring electrode is a kind of precision component, do not get it out from the measuring chamber frequently unless under necessary conditions. Wash pH electrode on a regular basis.
2. Only special-purpose cables can be used for the measurement and no other type of cable can be used for this purpose. Using unqualified cables for measuring purpose will result in large error.
3. If the measuring electrode is damaged or disabled, it is necessary to replace it with the same type of combined electrode. Then calibrate the newly replaced measuring electrode according to Chapter 5 of this instruction manual.
4. This instrument is an assembly of precision integrated circuit and electronic organs. Therefore, precautions should be taken to protect the instrument from any possible damage by humidity.

Optional Spares / Accessories can be ordered separately.

SCT-108.005.06A	pH probe with 10 meter cable
SCT-108.002.AA	pH 4.00 Buffer solution - 500ml
SCT-108.002.AG	pH 7.00 Buffer solution - 500ml
SCT-108.002.AM	pH 10.01 Buffer solution – 500ml
SCT-108.002.CA	Electrode Storage solution – 500ml
SCT-108.005.06B	Mounting clamps

As a quality control procedure, before releasing the controller for sale. Our Quality control in the factory performed & assures the following conformity as per the standards.

CONFORMITY DECLARATION **Application of Council Directive** **Standards to Which Conformity is Declared:**	
Compliance Testing	• Vibration to EN 60945 - Section 8.7 • Dry Heat to EN 60945 – Section 8.2 • Damp Heat to Lloyds register Test Spec. No. 1 Section 14 • Low Temperature to EN 60945 – Section 8.4.2 • 22 Degree Tilt operation
Emissions & Immunity	Tested and passed: EN61326-1: 2006
Product Safety	Tested and passed: ETL (tested to ANSI/ UL61010-1-2004) Tested and passed ETL (tested to CAN/CSA C22.2 No.61010.1-2nd Edition, dated July 12, 2004)

VIII. SCT-INTERNATIONAL WARRANTY & RETURN POLICIES

This SCT-pH-MINI has been subject to thorough testing and quality control. In the unlikely event of any manufacturing faults occurring, our one year warranty (from the date of delivery) covers SCT-pH-MINI This warranty becomes void in case of incorrect operation, use of non-appropriate spare parts or accessories and non-authorized modification of the SCT-pH-MINI. The warranty for the probes are generally for 6 months,based on the customer's use. Should you have any questions about SCT-pH-MINI or require service, please contact the ScichemTech-USA through E-mail: service@scichemtech.com or ScichemTech's local service Dealer in your Country. Please have the unit's serial number (located on the back panel of the instrument) available when making the complaint. Do not send the unit for service without getting the repair authorization number. Should the SCT-pH-MINI need service be sure to decontaminate it. The unit should be properly packed to avoid damage. Any damage resulting from improper packing shall be the responsibility of the user or the buyer.

CAUTION! SCT-pH-MINI SHOULD BE OPERATED BY THE TECHNICAL STAFF AND MAINTAINED BY PROFESSIONAL ENGINEER.

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