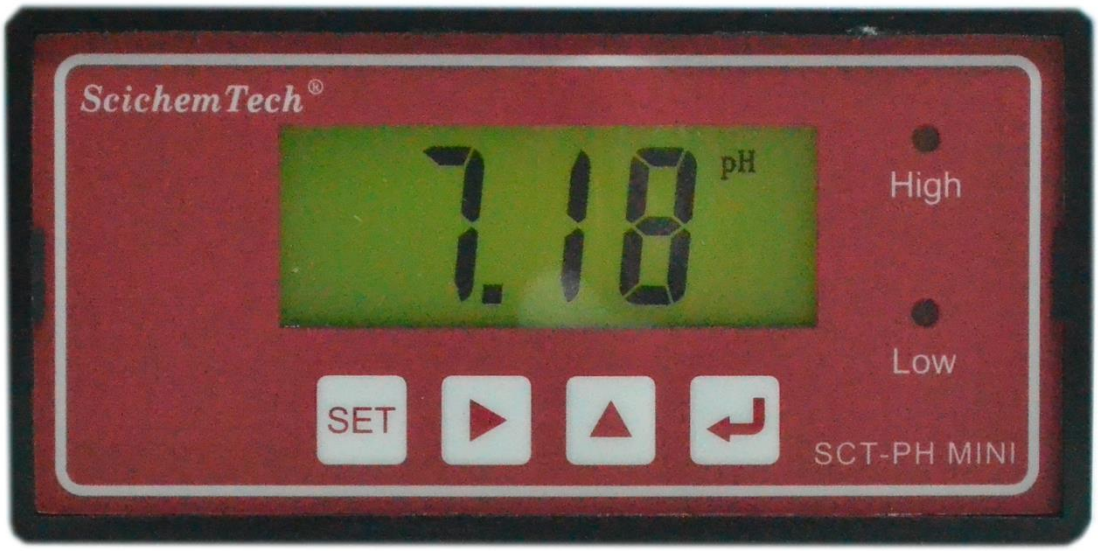
ScichemTech-USA

SCT-pH-MINI

SCT-pH-MINI Horizontal Controller

SCT-108.005.01

User/Operational Manual


ScichemTech®
7.18
pH
High
Low
SET
SCT-PH MINI

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I: Model & Instrument Type:

Thank you for purchasing and selecting Our SCT- Product 108.005.01

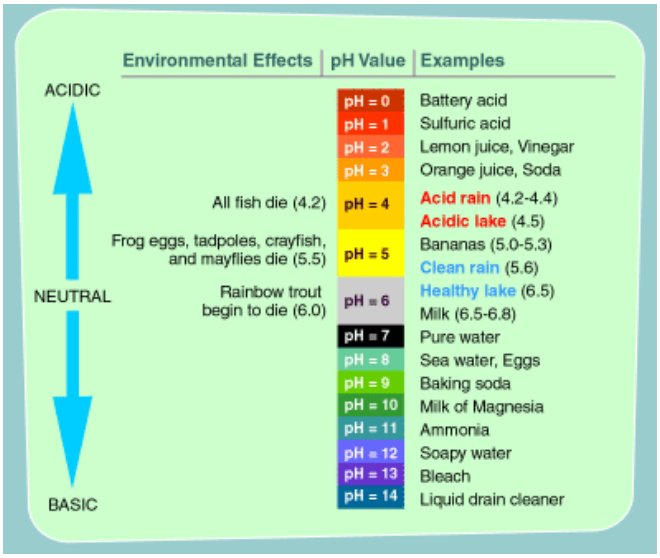
Model: **SCT-PH-MINI Horizontal Controller.**

Once again we thank you for choosing our Model: SCT-PH-MINI Horizontal Controller for your purpose and for your pH measurements requirements. 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.

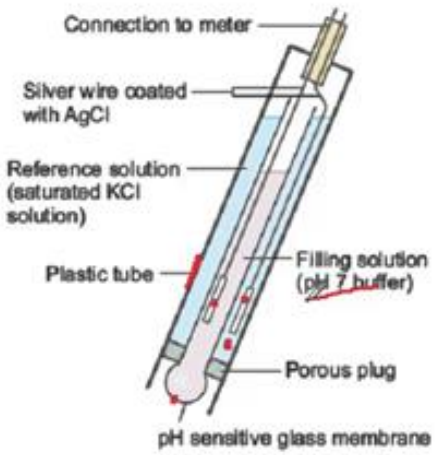
A pH Controller provides a value as to how acidic or alkaline a liquid is. The basic principle of the pH controller is to measure the concentration of hydrogen ions. Acids dissolve in water forming positively charged hydrogen ions (H+). The greater this concentration of hydrogen ions, the stronger the 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: **SCT-108.005.01**

Model: **SCT-PH-MINI Horizontal 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.

3.1 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

3.2: Applications of SCT-PH-MINI Horizontal Controller.

SCT-PH-MINI Horizontal pH Controllers are designed for the measurement and control of industrial on-line pH .

All our ScichemTech's Horizontall Controllers can be used in any water related applications as per the specified parameter & the measuring range.
However our general applications as follows;
Water purification related applications, Aqua cultures , Food Processing industries, Educational Sectors, Water Treatment Industries, Hydroponics, General Laboratories, Swimming Pools / Jazcucies, Environmental Labs, Electro-plating Industries, Mining Industries, Paper Industries, Horticulture Departments, All kinds of Agricultural applications, Aquaponics, Sewerage treatment Plants, Electronics-Circuit Industries, Chemical Industries, Fermentation Industries, Petro-Oil Industries, Water Process management Systems, Verification & Calibration Agencies, Gardening Industries, Beverage & Drink Industries, Ink & Paint Industries, Water Reverse Osmosis systems, Ultrapure water Verifications especially in Bio-Tech,Tissue Culture, Micro-biological & Nano-Technological related applications. Medical & Pharma Industries, And also can be used for the verification & production of water for the Space industries.
In case, if you need to use it for any other specific applications, please contact us directly or through our reputed Dealers & Distributors.
However, SCT-108.005.01 can be used in many other fields & applications too.

IV: Technical Specifications:

Our SCT- Product Number :108.005.01 : Model: SCT-PH-MINI Horizontal Controller has the following Specifications;

PRODUCT NO	**SCT-108.005.01**
SCT MODEL NO	**SCT-PH-MINI**
Measurement range	0.00~14.00pH
Resolution ratio	0.02 pH
Accuracy ±0.1pH	Accuracy ±0.1pH
Display	3½-digit apheliotropic liquid crystal display
Calibration mode	three-point calibration (automatic identification of solutions)
Manual temperature compensation	0~80°C
Temperature of measured solutions	0~80°C
Compression resistance of electrodes	0~0.6MPa
Measurement distance	standard configuration 10m(≤40m)
Output current	insulated 4~20mA (≤500 Ω)
Control output	maximum and minimum (constantly open) contact point output
Capacity of contact points	3A/AC250V (with resistant loads)
Power supply	AC 220V~240V 60Hz

Environmental conditions	Temp : 0 to 50°C Humidity: ≤85%
External dimensions	48×96×100mm (height × width × depth)
Face Opening	45×91mm
Installation Method	panel-mounted

V: 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!

Please follow the below instructions, Prior to Installation

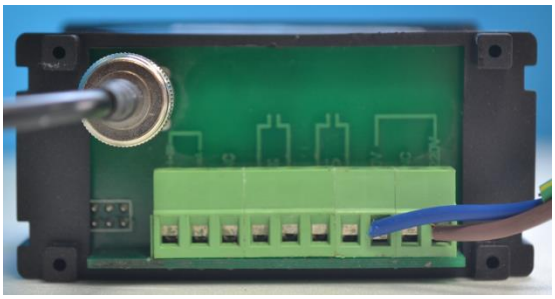
Please make sure that the Controller is intact & without any damages ,prior using it. If it is good, then the Controller is ready to use.

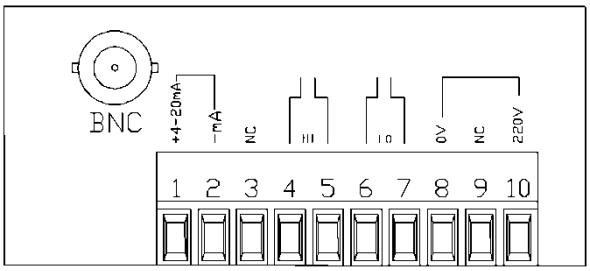
VI: Installation & Method Of Operations:

Our SCT- Product Number :108.005.01 : Model: **SCT-PH-MINI Horizontal Controller** is easy to install & operate. Below ,we have given the detailed wiring connections & the probe installation. We strongly suggest & recommend the user to evaluate the type installation & if any other environmental factors like Temp, Humidity, Direct Sunlight, High wind, Corrosion etc..,

6.1. Wiring Connections

6.1 Connection Mapping:





The back cover plate

Connection Details:

(1) 4-20 mA positive terminal
(2) 4-20 mA negative terminal
(3) with no connections in the interior
(4) (5) the constantly open output terminal of maximum control relay
(6) (7) the constantly open output terminal of minimum control relay
(8) (10) input terminal of 220V AC power supply
(9) with no connections in the interior

Once proper connections are established, please check the leakage for the electrical current. Now the controller is ready for the operation.

6.2. Key board instructions & Menu –Instrument Operations

The user has to first understand the Keyboard symbols & keys ,prior to setting & operations.



6.2.1 Keyboard instructions

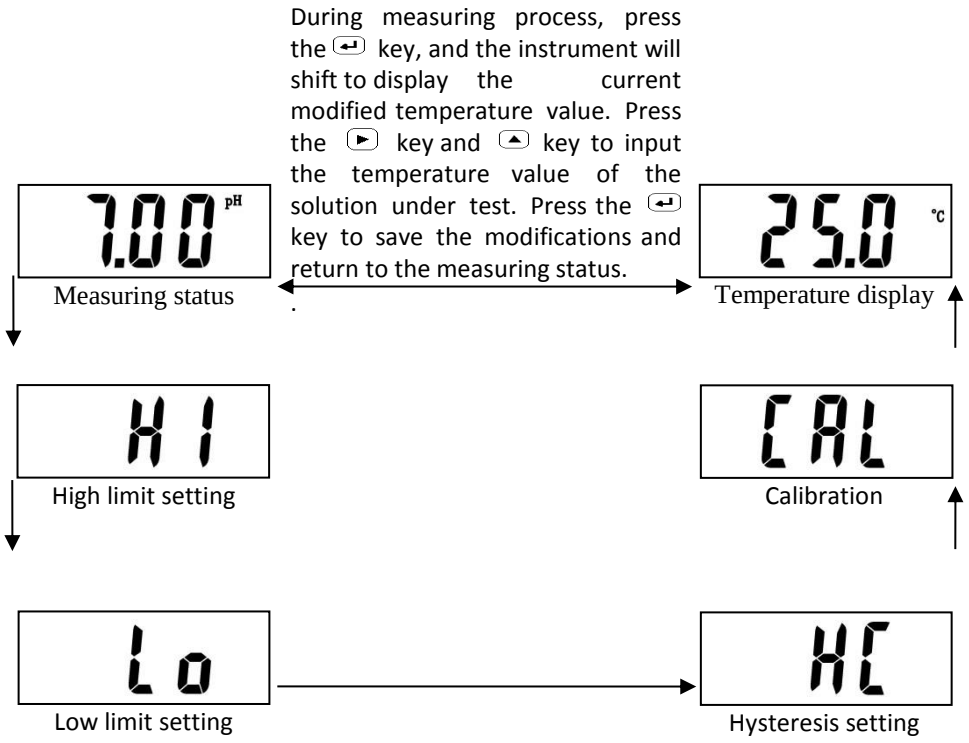
SET Menu ▶ shift left ▲ add ↵ confirm

6.2.2. Switch & Display Descriptions:



6.2.3. Menu Setting & Operations-Measurement

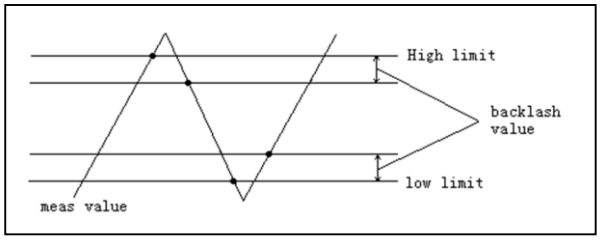
In the measuring state, press the button ↵, and then the instrument will be changed over. Indicating the temperature which is being corrected currently, press ▶ and the button ▲ to input the temperature of the solution being measured, Press the button ↵ to save the value and return to the measuring state



Instructions: Keep pressing the SET key, and the "Set" options of the instrument will shift among the above statuses. Press 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 ↵ 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 flickering 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

6.2.4: Calibrations :

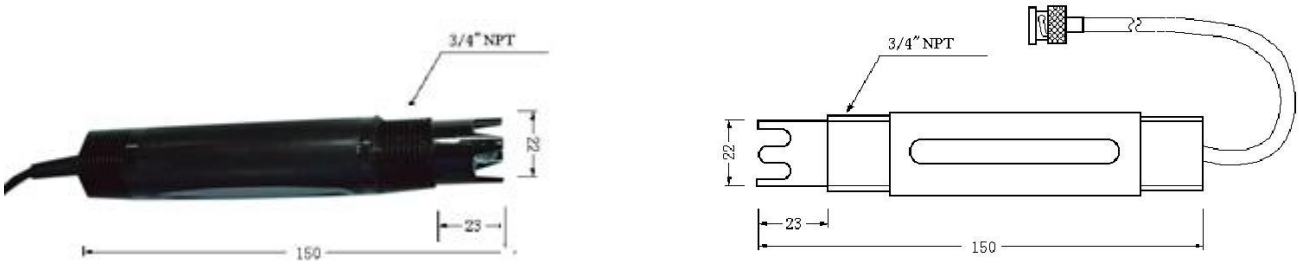
All our ScichemTech's Horizontal Controllers are Calibrated in the factory & programmed for automatic calibration, user friendly, highly reliable, with automatic compensation of all the related Environmental factors. Our high class Quality control adopts SMT(Surface mounted Technology) & AOI (Automated Optical Inspection), with manual individual verification. All the products are manufactured as per ISO Standards. Incase, if you like to perform the calibration You can just do the normal calibration using any brand's solutions. However , we strongly recommend to use our SCT Buffers & Standard solutions because, All our standards ,Buffers & Reagents are prepared with high quality pure fine chemicals traceable to NIST. And the bottles & containers are made to be user friendly ,easy & convenient to do the Calibrations.

Calibration of the instrument

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, 6.86 and 9.18 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 ↵ key, and the instrument will display **"C1"**. Then put the hand and wait for 3-5 minutes. **Press the ↵ 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 ↵ 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 ↵ 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 ↵ 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 mercury thermometer. Then press the ▶ key and the ▲ key to input the measured temperature into the instrument.
(7) Press the ↵ 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, the instrument should be sent to its manufacturer for maintenance.

6.3. Installation of the Measuring Electrode



The measuring electrode is a kind of compound electrode with plastic housing and a 3/4" NPT pipe thread joint.

Installing the PH electrode or probe is an important procedure to get the constant & consistent accurate results. Our SCT probes are designed in a user friendly manner, generally with complete immersion ,it gives steady results.
Please follow the diagram ,for installing the electrode or probe. Please the pipeline , it must be without any Air bubbles or backwater on the measuring PH cell.
Always make sure that you have installed correctly as per our diagram & instructions.
Fig 2 & 3

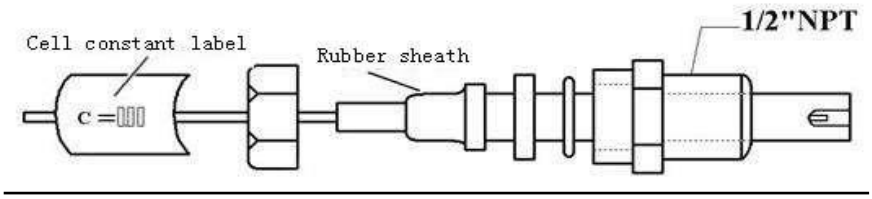


Figure 2 Electrode appearance

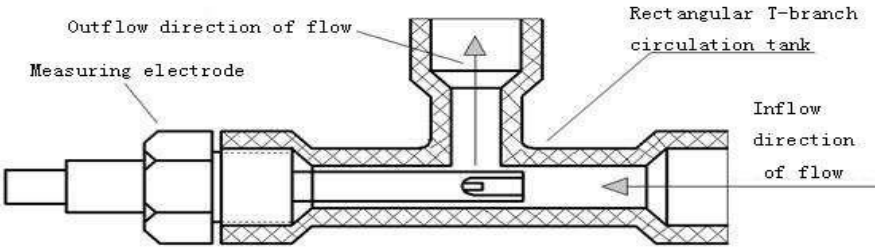


Figure 3 Pipeline installation method

the above mentioned given probes are EC AND TDS,similarly do it for the pH also.

Electrode Positioning & Placement:

1. The electrode should be installed in the place with low position, stable flow rate and where air bubbles should be avoided in the pipeline.

2. The pH cell, whether horizontal installation or vertical installation, should be immersed in the flow.

3. In the case that the measuring signal is a kind of weak electronic signal, the measuring cable should trace line independently and the connection of it with power line and control line in a same group of pipe-lines should be prohibited to prevent from affecting its functions.

4. In the case that the measuring cable needs to be lengthened, please contact the ScichemTech or Our SCT Dealer and get their advice & free consultation.

VII: Precautions & Maintenance:

7.1 : 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.

7.2 : Precautions :

- 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.
- 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.
- 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 Section 6.2.4 of this instruction manual.
- 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-108.005.01A	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-108.005.01B	Mounting clamps

VIII: SCT-International Warranty & Return Policies

This SCT-pH-MINI 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. 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.

Scientific Chemical Technologies

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