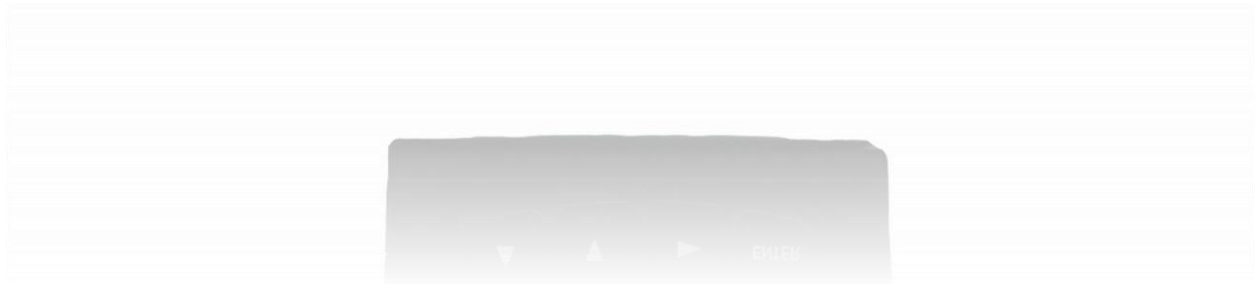




ScichemTech-USA

SCT-108.005.17/18

**SCT-PH /ORP-MAXI HR
ScichemTech PH/ORP Maxi Controller
User/Operational Manual**



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I. MODEL AND INSTRUMENT TYPE

Thank you for purchasing and selecting Our SCT- Product Number: SCT-108.005.17/18

Model: SCT-pH/ORP-MAXI HR– The online PH/ORP Controller.

Once again we thank you for choosing our Model: SCT-PH/ORP-MAXI – The online PH/ORP Controller for your PH/ORP 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:

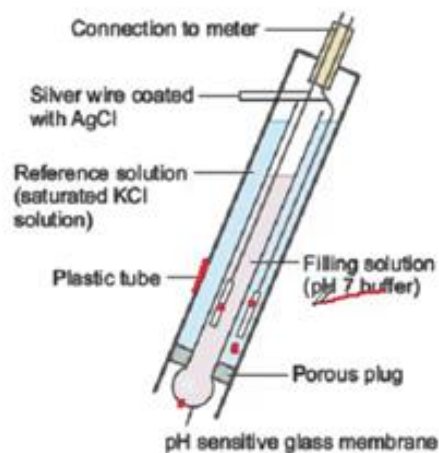
In the process world, pH is an important parameter to be measured and controlled.

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.

	Environmental Effects	pH Value	Examples
ACIDIC ↑		pH = 0	Battery acid
		pH = 1	Sulfuric acid
		pH = 2	Lemon juice, Vinegar
		pH = 3	Orange juice, Soda
	All fish die (4.2)	pH = 4	Acid rain (4.2-4.4)
	Frog eggs, tadpoles, crayfish, and mayflies die (5.5)	pH = 5	Acidic lake (4.5)
		pH = 5	Bananas (5.0-5.3)
		pH = 5	Clean rain (5.6)
NEUTRAL ↓		pH = 6	Healthy lake (6.5)
	Rainbow trout begin to die (6.0)	pH = 6	Milk (6.5-6.8)
BASIC ↓		pH = 7	Pure water
		pH = 8	Sea water, Eggs
		pH = 9	Baking soda
		pH = 10	Milk of Magnesia
		pH = 11	Ammonia
		pH = 12	Soapy water
		pH = 13	Bleach
		pH = 14	Liquid drain cleaner

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: **108.005.17/18***

*Model: **SCT-MAXI PH/ORP HR 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 MAXI 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-MAXI 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-108.005.17 can be used in many other fields & applications too.

III. TECHNICAL SPECIFICATIONS

Of Our SCT- Product Number: SCT-108.005.17/18

Model: SCT-Ph/ORP-MAXI HR– The online PH Controller

The housing box for packing	<ul style="list-style-type: none"> (1) Protection grade: IP65, front (2) Material of the shell: ABS (3) Screen: synthetic polyester (4) Keys: 4 encapsulated silicone keys (5) Weight: about 225g
Display:	<ul style="list-style-type: none"> ■ LCD display with backlight, LCD 2x16 bit ■ Contrast: defined by users, 5 levels ■ Refresh rate: 3s
Electrical performance	<ul style="list-style-type: none"> ■ Power: 18-36V DC
Input range of the sensor	<ul style="list-style-type: none"> ■ Ph: 0.00-14.00 ■ TDS: -2000 TO 2000 MV ■ Temperature: -25-125°C
Current Output Signal	<p>-4-20mA, isolated, transportable Maximum impedance of the loop: 600Ω MAX@24V -Refresh rate: 3S -Accuracy: ±0.03mA@25°C, 24V</p>
Control output signals	<ul style="list-style-type: none"> ■ Operating mode: Hi/Lo/off (normally open contact) ■ Capacity of the relay contact: 2A/250V AC (resistive load); 2A/28V DC (resistive load)
Pulse Output Signal	<ul style="list-style-type: none"> ■ Output signal of the open collector, optical isolation ■ The maximum pull-down current is 50mA and the maximum pull-up voltage is 30VDC. ■ Pulse modes (maximum pulse rate: 400p/m) <p>485 communication output signal</p>
Overall dimension:	96x96x46mm (HxWxD)
Environmental conditions	<p>Working temperature: -10~70°C Storage temperature: -15~80°C Relative humidity: 0~95%, no dew point</p>
Insulation grade:	II

IV: UN-PACKING & PRE-INSTALLATION REQUIREMENTS:

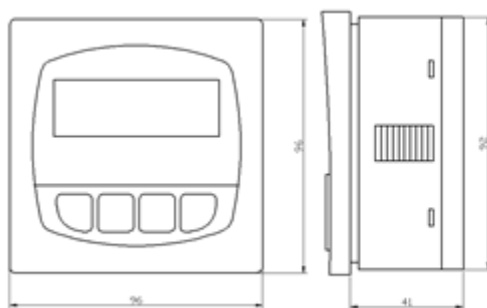
Follow these steps after receiving the instrument:

- 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.

V. INSTALLATION & METHOD OF OPERATIONS

▪ **5.1. Main installation**

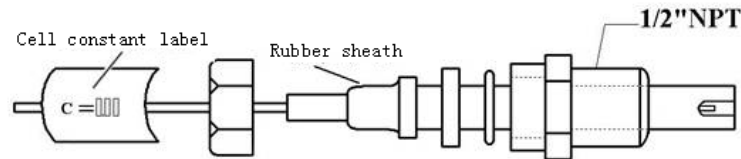
- As we mentioned earlier, the meter should be installed in a clean, dry, well ventilated, vibration-free location around should be no corrosive gases. Make a rectangular cut out in the instrument cabinet or panel installation. Using the locking tools fix the Controller firmly into the Panel or Cabinet.



▪ **5.2. Electrode installation**

- TDS 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,

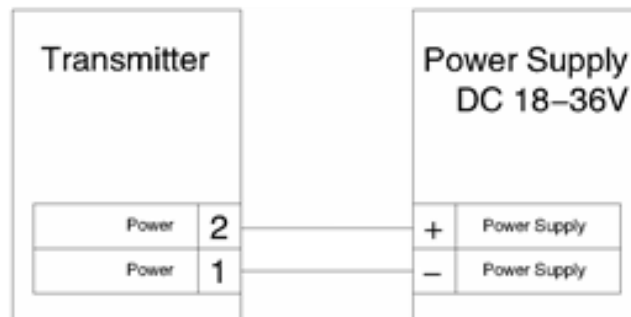
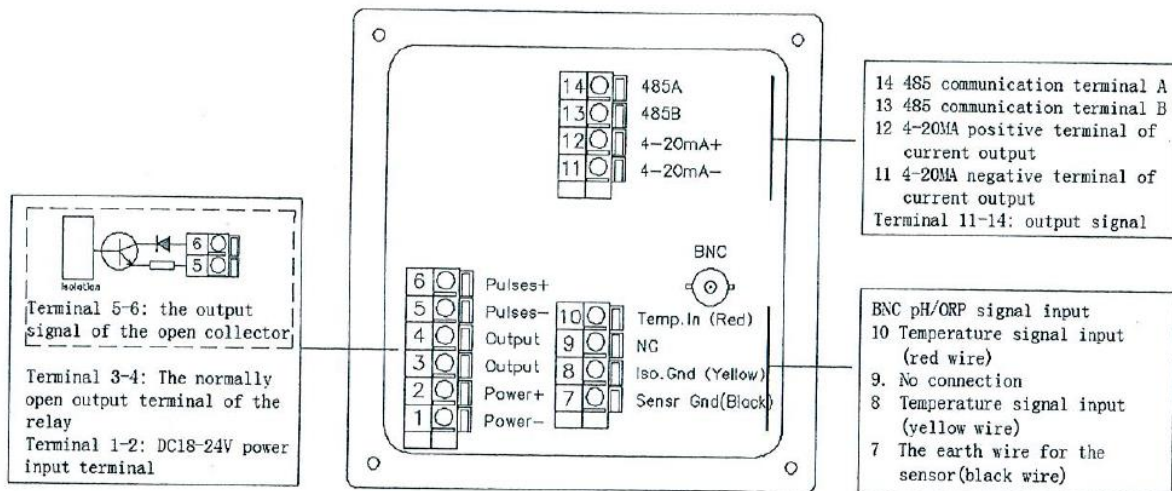
respectively, TDS electrode is connected to the connecting rod (water) to prevent the electrode cable can be fixed after inserted into the water, with the fixing bracket. Before installation, be sure to use the raw material with the (threaded Department) good waterproof closed. The measured media should be kept online monitoring and constant minimum flow rate of 15cm³/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/ORP CONTROLLER

5.1 Back cover plate



The back cover plate

5.4. CONTROLLER OPERATION

Wiring instructions:

- The cables for the sensor and the AC cables cannot be laid in the same cable conduit as electronic noise can disturb the signals of the sensor.
- To lay the cables in the grounded metallic cable conduit is conductive to prevent electronic noise and mechanical damage.
- Seal the entrances of the cables in order to protect the cables from being damaged by humidity.
- Insert one conductor into each terminal socket. If two conductors need to be inserted in the same terminal socket, it is necessary to connect the two conductors and the terminal outside the terminal socket.

Choose the sensor with a proper measuring range according to the maximum and minimum values in the process flow

The VIEW Menu

- During normal operation, the instrument displays VIEW menu.
- When using CALIBRATE menu or OPTIONS menu, if no key is pressed for over ten minutes, the instrument will automatically return to VIEW menu.
- Press the Up and Down arrow keys to have different contents displayed. The display options are continuous and can be repeatedly displayed.
- Changing the display options will not interrupt the normal operation of the system.
- No password is needed to change the display options.



Output settings cannot be edited in the VIEW menu.

The VIEW menu (pH VIEW)

Displayed content	Description
7.00 pH 25.0 °C	Display the pH values and the temperature values indicated in the sensor. This is a permanent display format.

The following items are displayed temporarily and the system will return to the display items 10 minutes later.

Loop Output: 12.00 mA	Display a current output value of 4-20mA.
EASY CAL: >	Quick pH calibration

The VIEW menu (ORP VIEW)

Displayed content	Description
ORP 0 mV	Display the mV values indicated in the ORP sensor. This is a permanent display format.

The following items are displayed temporarily and the system will return to the permanent display items 10 minutes later.

Loop Output: 12.00 mA	Display a current output value of 4-20mA.
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VI. CALIBRATION OF THE pH/ORP CONTROLLER

Calibration is to ensure accurate measurements from your pH/orp 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/orp buffer and following the calibration steps based on our specific pH/orp Controller.

Three-point calibration should be adopted. During the calibration process the controller will be calibrated to the known buffer.

Before calibration, prepare the buffer solution with pH/orp values of 7.00/4.00/10.01/222mv 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)

Step 1: -keep pressing the ENTER key:

-Keep pressing the ENTER key for 2 seconds, and the system will enter into CALIBRATE menu.

-Keep pressing the ENTER key for 5 seconds, and the system will enter into OPTIONS menu.

Step 2: -Press the Up-Up-Up-Down arrow keys according to the sequence of the password.



-After the password is typed in, the first item of the selected menu option will be displayed.

Step 3: -Drag the menu by pressing the Up or Down key.

-Press the Up or Down arrow key to exit the menu and return to measurement status.

Step 4: -Choose the menu option to be edited by pressing the Right arrow key.

-The first bit of the displayed content starts to flicker.

Step 5: -Press the Up or Down arrow key to edit at the flicker bit.

-Press the Right arrow key to move the flicker bit forward.

-Press the Up or Down arrow key to return to the previous menu.

Step 6: -Press the ENTER key to save the new settings and then return to Step 3.


The Calibrate Menu I (Ph Calibration Menu)

Displayed content (the content are the factory settings)	Description
Temp Input Model: MTC >	Temperature compensation input mode: MTC represents manual temperature compensation; ATC represents automatic temperature compensation.
Set: MTC 25.0 >	Adjust the measured temperature values of the system according to accurate external reference. (MTC/ ATC).
Set: pH >	For a sensor, completion of this single-point wet calibration will lead to the most accurate measurement result. When all the input values are “zero”, the “TEMP” value and the “pH” value will be restored to the factory settings.
Loop Range: pH 0.00→14.00 >	Set the minimum and the maximum physical values (4mA and 20mA respectively) that are corresponding to the current output signal.
Output Mode: Off >	Choose either a “High”, “Low” or “Off” working model for the relay. If the “High” and “Low” functions are not needed, the working model can be turned to “Off”.
Output Setpnt: 7.00 pH >	Under “Low” or “High” model, if the process variable reaches the set value, the relay output signal will be excited.
Output Hys: 0.50 pH >	When the measured value reaches the set value ± the return difference value, the relay output signal will be reset. Choosing “+” or “-” depends on whether the relay is under “High” or “Low” working model. (See page 3 for more details.)
Pules Range: pH 0.00→14.00 >	Set the pulse rates at the starting and end points that are corresponding to the pulse signals.
Output PlsRate: 400 Pulses/Min >	Set the maximum pulse rate of the proportional pulse signal. PC-8750 can accept the values within the range of 0-400.
RS485 Source: pH >	Choose the source signal that is corresponding to the RS485 communication output signals: pH value or temperature value; pH value and temperature value.
RS485 BaudRate: 4800 >	Choose RS485 communication baud rate: 1200,2400, or 4800.

The Calibrate Menu II (ORP Calibration Menu)

Displayed content (the content are the factory settings)	Description
Set: ORP >	For a sensor, completion of this single-point wet calibration will lead to the most accurate measurement result. When all the input values are "zero", the "ORP" value will be restored to the factory settings.
Loop Range: mV -2000→+2000 >	Set the minimum and the maximum physical values (4mA and 20mA respectively) that are corresponding to the current output signal.
Output Mode: ORP Off >	Choose either a "High", "Low" or "Off" working model for the relay. If the "High" and "Low" functions are not needed, the working model can be turned to "Off".
Output Setpnt: +0000 mV >	Under "Low" or "High" model, if the process variable reaches the set value, the relay output signal will be excited.
Output Hys: 50 mV >	When the measured value reaches the set value ± the return difference value, the output signal of the relay will be reset. Choosing "+" or "-" depends on whether the relay is under "High" or "Low" working models. (See page 3 for more details.)
Pules Range: mV -2000→+2000 >	Set the pulse rates at the starting and end points and the maximum pulse rate that are corresponding to the pulse signals.
Output PlsRate: 400 Pulses/Min >	Set the maximum pulse rate of the proportional pulse signal. PC-8750 can accept the values within the range of 0-400.
RS485 BaudRate: 4800 >	Choose RS485 communication baud rate: 2400, 4800, or 9600.

The OPTIONS Menu:

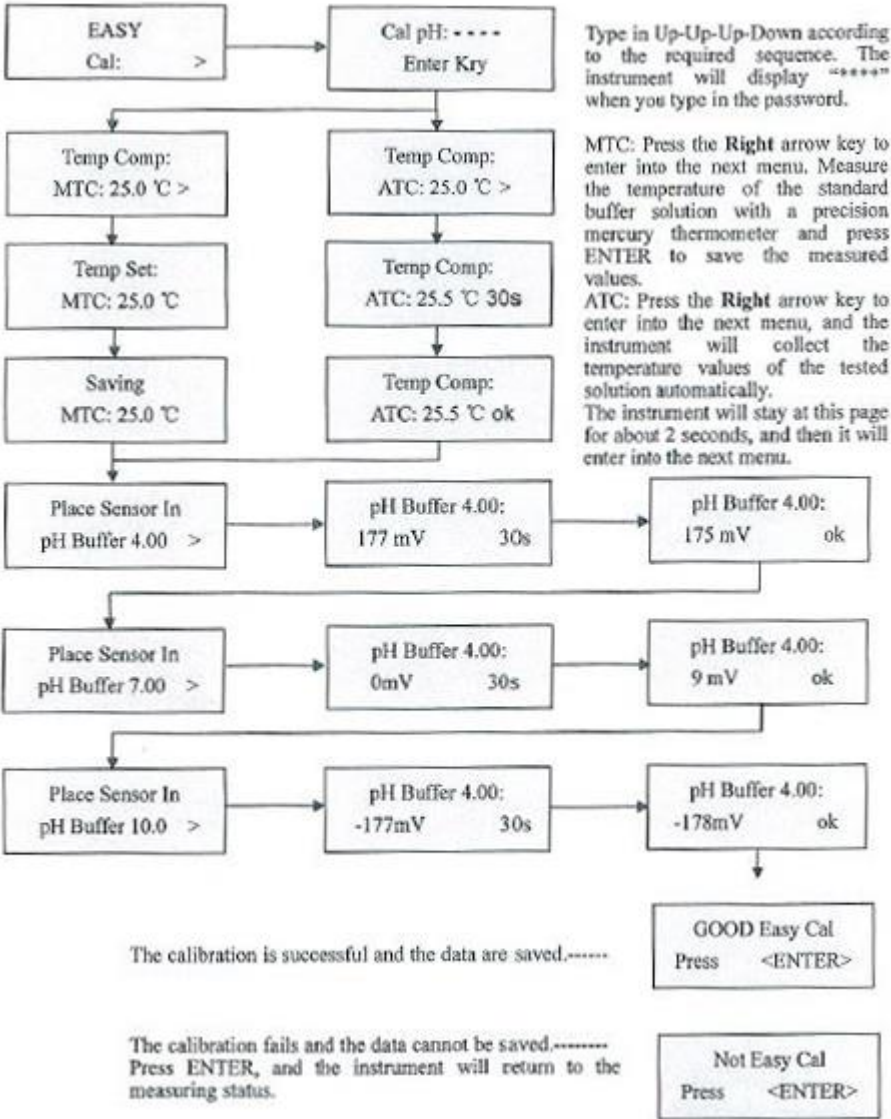
Displayed content (the content are the factory settings)	Description
Meas Units: pH	Choose the measurement mode: pH/ORP
Contrast: 3 >	Adjust the display contrast of the LCD in order to get the best visual effects. Level 1 is the relatively lower contrast while Level 5 is the relatively higher contrast. In relatively hot environment, it is better to choose the relatively lower contrast level.
Comeback Factory Set: >	 Use this function with caution. If you choose "yes", the instrument will resume its initial data, so that you need to re-calibrate the instrument. Therefore, we do not recommend the users to use this function.

Averaging: Off >	"OFF" is most responsive to the changes of the process variables. If there are frequent or large fluctuations, you may choose the deferred response time of 3s, 6s, 9s,..., 30s. The longest deferred response time is 30s.
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Easy Calibration Procedure – pH:

Electrical calibration for the instrument has been done on the factory.

The calibration procedure needs only pH buffers 4.00, 7.00,10.01 so as to simply the calibration procedure.



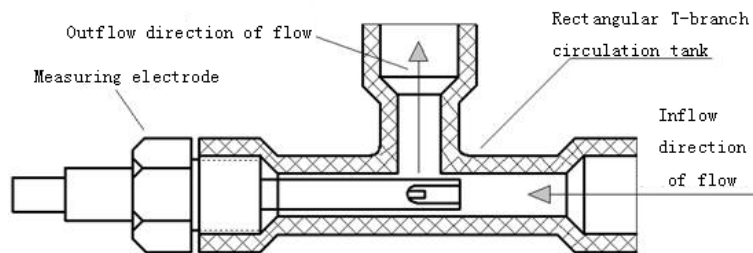
VII: PRECAUTIONS & MAINTANANCE:

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.
- 2) The electrode should be cleaned on a regular basis.

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 sulTDSide 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 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/ORP signal is a kind of feeble potential signal. The cables for collecting pH/ORP 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. pH/ORP ELECTRODE / PROBE MAINTENANCE

A system's pH/ORP 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/ORP 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/ORP electrode's lifetime is also finite. Even in the "friendliest" environments, pH/ORP 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/ORP 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.

Displayed content	The possible causes	The recommended solutions
Value must be 0 or more	The displayed or set values must be 0 or above	Set values that are equal to or above 0
-----	It displays the over range. When the process variation is close or equal to the limit of the sensor	Check the sensor and recalibrate the instrument.
Too much Error CHECK SENSOR	<ul style="list-style-type: none"> ■ The sensor is damaged or dirty. ■ Wiring error. ■ The temperature elements are damaged. 	<ul style="list-style-type: none"> ■ Clean or replace the damaged sensor. ■ Check whether wiring is correct. ■ Replace the sensor.

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	<ul style="list-style-type: none"> • 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.61010.1-2 nd Edition, dated July 12, 2004)
I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standard	

VIII. SCT-INTERNATIONAL WARRANTY & RETURN POLICIES

This SCT-pH/ORP HR 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/ORP HR. 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/ORP HR. The warranty for the probes are generally for 6 months, based on the customer's use. Should you have any questions about SCT-pH/ORP HR 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/ORP HR 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/ORP HR MAXI SHOULD BE OPERATED BY THE TECHNICAL STAFF AND MAINTAINED BY PROFESSIONAL ENGINEER.



Scientific Chemical Technologies LLC (ScichemTech®)

952-Troy Schenectady Road, Executive Office Suite 110,
Latham, NY 12110, ALBANY County, United States Of America.

Tel: 001 - 518 - 925 - 4470 Fax: 001 - 316 - 223 - 1805

E-mail: sales@scichemtech.com Web : www.scichemtech.com

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