EcoSense® pH/EC1030A

pH, Conductivity, TDS, Salinity, and Temperature Pen

USER MANUAL

Contents

INITIAL INSPECTION AND ASSEMBLY

Carefully unpack the instrument and accessories, and inspect for shipping damages. Notify your local dealer or YSI immediately (+1 937-767-7241 or info@ysi.com) of any damages or missing parts. Save packing materials until satisfactory operation is confirmed.

BEFORE FIRST USE

A. Install the Batteries

1. Remove the battery cap at the top of the unit.
2. Insert the set of batteries (included), ensuring correct polarities as marked.
3. Securely replace battery cap.
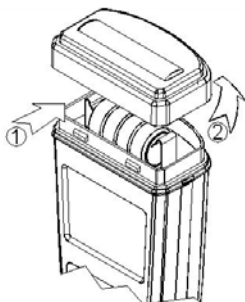
Note: If replacing old batteries, see Battery Disposal in the Maintenance section.

B. Soak the Electrode

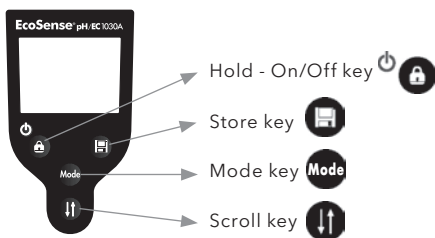1. Remove the electrode cap covering the pH/EC1030A meter electrode.
2. Soak electrode in pH 4 buffer for 10 minutes before first use or after storage. Depending on the age of the electrode, you may need to soak longer.

C. Setup and Calibrate the Electrode and Meter

The pH/EC1030A must be setup and calibrated before first use. Please follow the instructions detailed in the section Using the pH/EC1030A.

INSTRUMENT OVERVIEW

A. Meter and Keypad Description

- Battery cap
- Graphic LCD Screen
- Keypad
- Belt clip (Do not remove screw)
- Electrode collar
- Electrode & ATC assembly
  (Electrode cap shown covering electrode)

- Hold - On/Off key
- Store key
- Mode key
- Scroll key
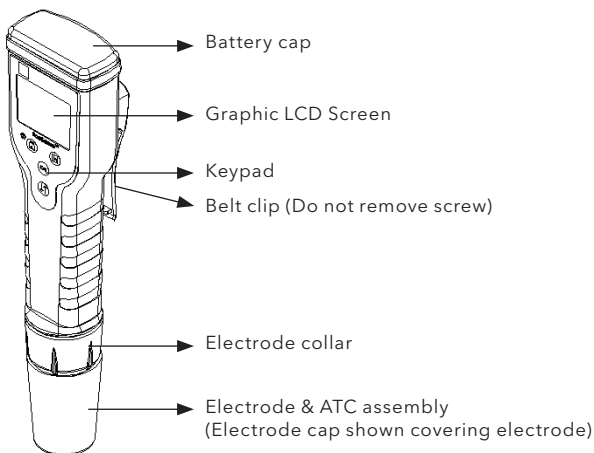
B. Display
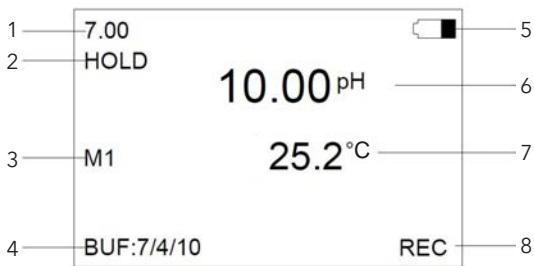
1. pH BUFFER mode indicator
2. HOLD mode indicator
3. DATA NUMBER indicator
4. CALIBRATION buffer(s)
5. BATTERY indicator
6. pH / CONDUCTIVITY / TDS / SALINITY reading
7. TEMPERATURE reading
8. RECALL DATA mode indicator

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C. Operation Modes

The pH/EC1030A has 6 operation modes:

1. **Measure Mode** is used to make pH/conductivity/TDS/salinity/temperature measurements.

2. **Calibration Mode** is used to perform 1, 2 or 3 point pH calibration and conductivity calibration.

3. **Hold Mode** is used to display held measured values for increased ease of use.

4. **Select Temperature Unit Mode** is used to select °C or °F.

5. **pH Buffer Set Select Mode** is used to select the buffer set, which can either be 7.00 (7.00/4.01/10.01) or 6.86 (6.86/4.00/9.18).

6. **Recall Data Mode** is used to display measured data which have been stored in the memory.

USING THE pH/EC1030A

A. Power ON/OFF

1. Press and hold the "Hold" key for 3 seconds. The unit will turn on and enter the "Measure Mode". Repeat the process to turn off the unit.

2. The unit will also automatically turn off after 10 minutes of no activity.

B. Temperature Units

1. The pH/EC1030A meter is factory preset to display in °C.

2. To change to °F, press the "Mode" key to enter the "TDS Measure Mode". The displayed units will be either mg/L or g/L in this mode.

3. Press and hold the "Mode" key for 5 seconds, the unit will enter the "Select Temperature Unit Mode".

4. Press the "Store" key to select "°C" and press the "Scroll" key to select "°F".

C. pH Calibration

pH Buffer Set Selection

1. In the "pH Measure Mode", press and hold the "Scroll" key for 5 seconds to enter the "pH Buffer Set Select Mode".

2. Press the "Store" key to select 7.00 (7.00/4.01/10.01) or press the "Scroll" key to select 6.86 (6.86/4.00/9.18). If you do not want to change the selected buffer set, press the "Mode" key to exit and return to "pH Measure Mode".

Note: There is no need to repeat this procedure every time unless one decides to change the buffer settings.

pH Calibration

1. With pH on the display, press the "Mode" key for 2 seconds to enter the "pH Calibration Mode".

2. Immerse the electrode into either pH 7.00 or 6.86 buffer solution, depending on the Buffer Set selected. A 'WAIT" icon will flash. The pH/EC1030A will determine when the calibration reading is stable.

3. When the "WAIT" icon disappears, one/first point calibration is now complete. Press "Mode" key to exit (i.e. only complete a one point calibration) or wait 5 seconds for the meter to enter two/second point calibration.

4. Repeat Steps 2 and 3 for two points/second point calibration by immersing in pH 4.01/4.00 **or** 10.01/9.18 buffers.

Note: For highest accuracy, perform a 2-point calibration.

5. Move to #6 for three/third point calibration or press "Mode" to exit two point calibration.

6. Repeat Steps 2 and 3 for three/third point calibration.

7. When the "WAIT" icon disappears, the unit will automatically return to Measure Mode.

D. Conductivity Calibration

Preparing Standard Solutions

Suitable conductivity standards are available commercially or the user can prepare them using research grade reagents. When calibrating, it is best to use a standard in the middle range of the solutions to be measured.

Here are some standard solutions the user can prepare to calibrate the conductivity sensor:

1. *Standard solution of 1413 μS at 25 °C*: Accurately weigh out 0.746 grams of research grade dried Potassium Chloride (KCl). Dissolve in 1000 mL of distilled water.

2. *Standard solution of 12.90 mS at 25 °C*: Accurately weigh out 7.4365 grams of research grade dried Potassium Chloride (KCl). Dissolve in 1000 mL of distilled water.

[*Note*: You can store the remaining solution in a plastic container for one week but the air space between the cap and the solution must be kept to an absolute minimum. Storing the excess solution below 4 °C can increase the storage life. If you have any doubt of the accuracy of the stored solution, a fresh batch should be prepared.]

Conductivity Calibration

1. Press "Mode" key to enter the "Conductivity Measure Mode". The units will be in µS/cm or mS/cm.

2. Clean and immerse the probe (at least 2" to 3" or 5 to 7 cm from the tip) into standard solution without touching the sides of the calibration container. Shake the probe lightly to remove any air bubbles trapped in the conductivity cell. Allow temperature to stabilize. The message "RANG" (range) may appear briefly on the display indicating auto-ranging. This is normal.

3. Press and hold the "Mode" key for 2 seconds to enter the "Conductivity Calibration Mode". The "CAL" icon appears on the display.

4. If needed, adjust the following conductivity settings:

   TDS FACTOR:
   The default factor value is 0.65. To change the TDS factor, use the "Store" and "Scroll" keys to adjust the value between 0.30 and 1.00. Press "Hold" key to save the new value and the unit will automatically go into the next calibration parameter. If the "Mode" key is pressed instead of the "Hold" key, any changes made will be canceled and the previous calibration settings will be retained.

   TEMP. COE.:
   The unit uses the temperature coefficient to calculate temperature compensated conductivity. The default value is 1.91%. To change the temperature coefficient, use the "Store" and "Scroll" keys to adjust the value between 0 and 4.00%. Press the "Hold" key to save the new value and the unit will automatically go into the next calibration parameter. If the "Mode" key is pressed instead of the "Hold" key, any changes made will be canceled and the previous calibration settings will be retained.

   TEMP. REF.:
   The unit uses the temperature reference value to calculate temperature compensated conductivity. The default value is 25 °C. To change the temperature coefficient, use the "Store" and "Scroll" keys to adjust the value between 15°C and 25°C. Press the "Hold" key to save the new value and the unit will automatically go into the next calibration parameter. If the "Mode" key is pressed instead of the "Hold" key, any changes made will be canceled and the previous calibration settings will be retained.

5. Use the "Store" and "Scroll" keys to adjust the conductivity value to that of the conductivity standard at 25 °C. Press "Hold" key to calibrate. The unit displays "CAL OK" to

indicate a successful calibration. Conductivity calibration is now complete and the unit will automatically switch to the "Conductivity Measurement" mode.

E. Measure

In the "Measure Mode", dip the meter into the test solution. Press "Mode" key to select: pH/Temperature, Conductivity/Temperature, TDS/ Temperature and Salinity/Temperature.

F. Hold Data

1. When the readings are stable, press the "Hold" key once to lock the reading on the display.

2. Press the "Hold" key again to unlock reading and the unit will return to the "Measure Mode". The unit is now ready for another measurement.

G. Save Data

Press and hold the "Store" key for 2-3 seconds in the "Hold Mode" or "Measure Mode". The "SAVE" and "M-XX" icons will appear indicating the reading has been saved and stored in memory location XX. The unit automatically returns to "Measure Mode".

Note: The non-volatile memory stores up to 50 sets of data (pH/Conductivity/TDS/Salinity and temperature) even if power is lost. If the memory is full, the next set of data will overwrite the first data set stored, etc.

H. Recall Data

1. In "Measure Mode" with Conductivity, TDS, or Salinity on the display (i.e. not pH on the display), press and hold the "Scroll" key for 2-3 seconds. The "REC" icon appears on the LCD and the last set of saved data will appear.

2. By pressing the "Store" or "Scroll" key, previously saved data sets will appear on the display.

3. Press "Hold" to exit and return to "Measure Mode".

I. Erase Data

1. In "Recall Data Mode", press "Mode" to enter "Erase Data Mode".

2. Press the "Store" key to erase ALL stored data and return to "Measure Mode."

3. Press the "Scroll" key to not erase ALL stored data and return to "Measure Mode."

MAINTENANCE

Battery Disposal

This instrument is powered by alkaline batteries, which the user must remove and dispose of when the batteries no longer power the instrument. Disposal requirements vary by country and region, and users are expected to understand and follow the battery disposal requirements for their specific locale.

The circuit board in this instrument may contain a manganese dioxide lithium "coin cell" battery that must be in place for continuity of power to memory devices on the board. This battery is not user serviceable or replaceable. When appropriate, an authorized YSI service center will remove this battery and properly dispose of it, per service and repair policies.

pH Electrode Replacement

1. Unscrew the electrode collar to remove the electrode & ATC assembly as shown in the figure on the right.

2. Remove the old electrode assembly from the electrode collar.

3. Insert a new electrode assembly (item # 606181) and make sure the electrode fits into the meter correctly.

4. Screw on the electrode collar.

5. Soak the new electrode in pH 4 buffer for 10 minutes. Calibrate the pH electrode.
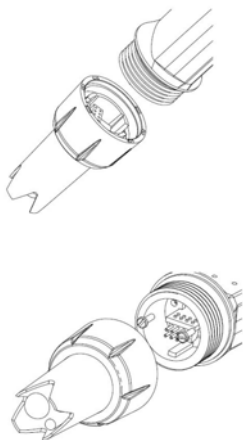
ERRORS AND TROUBLESHOOTING

Display Mode	Main Display	Secondary Display	Possible cause(s) [Action(s)]
pH Measure or pH Calibration	UNDR	UNDR	Temperature < -5.0 °C . [Bring solution to a higher temperature.] [Replace electrode.]
	OVER	OVER	Temperature > 60.0 °C . [Bring solution to a lower temperature.] [Replace electrode.]

Display Mode	Main Display	Secondary Display	Possible cause(s) [Action(s)]
pH Calibration	UNDR	0.0 to 60.0 °C	Offset @ 7.00pH: mV>100mV; Offset@6.86pH: mV>91.7mV; New slope> ideal slope by +30% [Use a new buffer solution.] [Replace electrode.]
	OVER	0.0 to 60.0 °C	Offset @ 7.00pH: mV< -100mV; Offset@6.86pH: mV<-108.7mV; New slope<ideal slope by -30% [Use a new buffer solution.] [Replace electrode.]
pH Measure	UNDR	-5.0 to 60.0 °C	pH value<0.00 pH. [Replace the test solution or recalibrate the meter.]
	OVER	-5.0 to 60.0 °C	pH value>14.00 pH. [Replace the test solution or recalibrate the meter.]
Conductivity Measure or Conductivity Calibration	UNDR	UNDR	Temperature < -5.0°C. [Bring solution to a higher temperature.] [Replace electrode.]
	OVER	OVER	Temperature > 60.0°C. [Bring solution to a lower temperature.] [Replace electrode.]
Conductivity Calibration	CAL UNDR	-5.0 to 60.0 °C	Correction of slope beyond -30%. [Use a new standard solution.] [Replace electrode.]
	CAL OVER	-5.0 to 60.0 °C	Correction of slope beyond +30%. [Use a new standard solution.] [Replace electrode.]
Conductivity Measure	OVER	-5.0 to 60.0 °C	[The conductivity value of the test solution is greater than 20mS/cm.] [Clean or Replace electrode.]

SPECIFICATIONS

Parameter	Range	Resolution	Accuracy
pH	0.00 to 14.00 pH	0.01 pH	±0.2 pH
Conductivity	0 uS/cm to 20.00 mS/cm	1 uS or 0.01 mS	0 to 10,000 uS/cm: ±1%FS >10,000 uS/cm: ±3%FS
TDS	0 mg/L to 20.00 g/L	1 mg/L or 0.01 g/L	±1%FS
Salinity	0.0 to 10.0 ppt	0.1 ppt	±1%FS
Temperature	-5.0 to 60.0 °C (23 to 140 °F)	0.1 °C (0.1 °F)	±0.5 °C (±0.9 °F)

pH
pH buffer recognition: pH 7.00, 4.01, 10.01 <u>or</u> pH 6.86, 4.00, 9.18
pH Temperature compensation: AUTO -5.0 to 60.0 °C
pH Buffer Temperature range: 0.0 to 60.0 °C
pH Electrode Offset recognition:
±100 mV at pH 7.00; +91.7 mV / -108.7 mV at pH 6.86
pH Electrode Slope recognition:
±30% at pH 4.00, 4.01, 9.18 and 10.01
Input impedance: >10^{12} Ω

Conductivity
Reference Temperature: 15.0 to 25.0 °C
Temperature Coefficient: 0.00% to 4.00%

TDS
TDS Constant: 0.30 to 1.00

Temperature
Temperature sensor: Thermistor, 10 kΩ at 25°C
Temperature unit: °C or °F

General
Power: LR44 x 4
Automatic shut off function: 10 minutes of non-use
Data logging capabilities: 50 data sets
Ambient temperature range: 0.0 to 50.0 °C
Relative Humidity: Up to 95%RH
Case: IP67 water-tight case
Dimensions (W x D x H): 44 mm x 25 mm x 200 mm
Weight: 95 g (Batteries included)

REPLACEMENT PARTS

Item Number	Description
606181	Replacement Electrode Kit
606188	Replacement Storage Cap

606118	Battery Compartment Kit (Includes battery cover and battery gasket)
605118	Battery Kit (Includes 4 batteries)

WARRANTY

The EcoSense pH/EC1030A Instrument is warranted for one year from date of purchase by the end user against defects in materials and workmanship. EcoSense pH/EC1030A electrodes are warranted for six months from date of purchase by the end user against defects in material and workmanship. Within the warranty period, YSI will repair or replace, at its sole discretion, free of charge, any product that YSI determines to be covered by this warranty.

To exercise this warranty, write or call your local YSI representative, or contact YSI Customer Service in Yellow Springs, Ohio. Send the product and proof of purchase, transportation prepaid, to the Authorized Service Center selected by YSI. Repair or replacement will be made and the product returned, transportation prepaid. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days from date of repair or replacement.

Limitation of Warranty
This Warranty does not apply to any YSI product damage or failure caused by: (i) failure to install, operate or use the product in accordance with YSI's written instructions; (ii) abuse or misuse of the product; (iii) failure to maintain the product in accordance with YSI's written instructions or standard industry procedure; (iv) any improper repairs to the product; (v) use by you of defective or improper components or parts in servicing or repairing the product; or (vi) modification of the product in any way not expressly authorized by YSI.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. YSI's LIABILITY UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF THE PRODUCT, AND THIS SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY DEFECTIVE PRODUCT COVERED BY THIS WARRANTY. IN NO EVENT SHALL YSI BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY DEFECTIVE PRODUCT COVERED BY THIS WARRANTY.

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