PCE Americas Inc.
711 Commerce Way
Suite 8
Jupiter
FL-33458
USA
From outside US: +1
Tel: (561) 320-9162
Fax: (561) 320-9176
info@pce-americas.com

PCE Instruments UK Ltd.
Units 11
Southpoint Business Park
Ensign way
Hampshire / Southampton
United Kingdom, SO31 4RF
From outside UK: +44
Tel: (0) 2380 98703 0
Fax: (0) 2380 98703 9
info@industrial-needs.com

www.pce-instruments.com/english
www.pce-instruments.com

Operation Manual

PCE-PH 25

Microcomputer Based pH/Condctivity/TDS/ Sanility & Temperature Pocket Meter

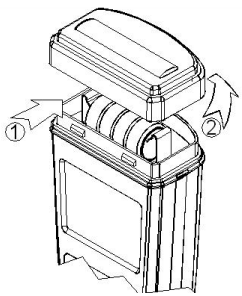
CONTENTS

INITIAL INSPECTION AND ASSEMBLY

Carefully unpack the instrument and accessories. Inspect for damages made in shipment. If any damage is found, notify th producer immediately. All packing materials should be saved until satisfactory operation is confirmed.

BEFORE YOUR FIRST USE

A. Replace the Batteries



1. Take off the battery cover as shown in the right figure.
2. Remove all of the old batteries and insert a new set of batteries ensuring the polarities are correct.

B. Soak the Electrode

1. Remove the electrode cap covering the PCE-PH 25 meter.
2. Soak the electrode in a pH 4 solution for 10 minutes before first use or after storage.

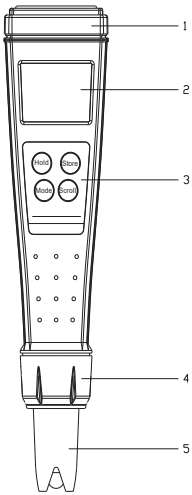
C. Setup and Calibrate the Electrode and Meter

PCE-PH 25 must be setup and calibrated before your first use. Please follow the instructions detailed in section

USING pH-Meter PCE-PH 25.

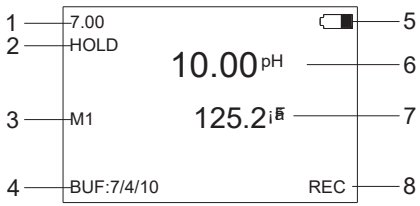
PCE-PH25 OVERVIEW

A. Meter Description



1. Battery cap
2. LCD screen
3. Keypad
4. Electrode collar
5. Electrode & ATC assembly (Electrode cap is not shown.)

B. Graphical 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 / SANILITY reading
7. TEMPERATURE reading
8. RECALL DATA mode indicator

OPERATION MODES AND KEYPAD OPERATIONS

A. Operation Modes

The pH-meter has 6 operation modes:

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

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

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

4. Temperature display set mode. This Mode is used to select °C or °F.

5. pH Buffer Select Mode. Buffer 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. Recall Data mode is used to display measured data which have been stored in the memory.

B. Keypad Operations

Key	Operation Mode	Duration	Function
Hold	All, except Hold	1 second	Turns meter on/off.
	Conductivity Calibration	0 second	Saves the Calibration reading.
	Recall Data	0 second	Returns to Measure Mode.
	Measure	0 second	Holds current measurement reading. Press again to resume measuring.
	Hold	0 second	Returns to Measure Mode.

Key	Operation Mode	Duration	Function
Mode	Measure	0 second	Selects display mode. Pressing this key changes the display sequentially to display pH/Temp, Conductivity/Temp, TDS/Temp and Salinity/Temp modes.
	pH Measure	2 seconds	Enters pH Calibration mode.
	Conductivity Measure	2 seconds	Enters Conductivity Calibration mode.
	TDS Measure	10 seconds	Selects Temperature °C or °F mode.
	Recall Data	0 second	Selects whether or not to erase all stored data.
Store	Measure	2 seconds	Stores current pH/Temp, Conductivity/Temp, TDS/Temp and Salinity/Temp reading into memory.
	Temperature display mode Selects	0 second	Selects Temperature °C
	pH Buffer Select	0 second	Selects 7.00 Buffer Sets and Leaves Buffer Select Mode.
	Recall Data	0 second	Decreases current number.

Key	Operation Mode	Duration	Function
Scroll	Measure	2 seconds	Enters Recall Data Mode.
	Temperature display mode Selects	0 second	Selects Temperature °F
	pH Measure	5 seconds	Enters pH Buffer Select Mode.
	pH Buffer Select	0 second	Selects 6.86 Buffer Sets and Leaves Buffer Select Mode.
	Recall Data	0 second	Increases current number.

USING PCE-PH 25

A. Power ON/OFF

1. Press and hold “Hold” key for 1 second. 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 key activity.

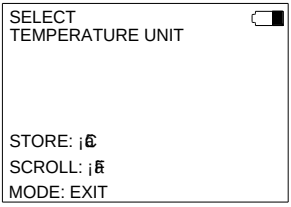
B. Temperature Unit Select Mode

1. The PCE-PH 25 meter is factory pre-set in “°C”.

2. To change to “°F”, press “Mode” key to enter the “TDS Measure Mode”.

3. Press and hold the “Mode” key for 10 seconds, the unit will enter the “Temperature Unit Select Mode”.

4. Press “Store” key to select “°C” and press “Scroll” key to select “°F”.



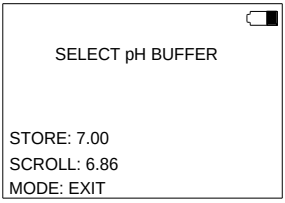
C. pH Calibration

a. pH Buffer sets Select

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

2. Press “Store” key to select 7.00 (7.00/4.01/10.01) or press “Scroll” key to select 6.86 (6.86/4.00/9.18) .

3. Press “Mode” key to exit and return to “pH Measure Mode”.

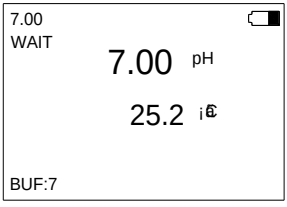


Note: There is no need to repeat this procedure every time unless one decides to change the buffer settings.

b. pH Calibration

1. Press “Mode” key to enter the “pH Measure Mode”.

2. Clean and dip meter into either pH 7.00 or 6.86 buffer solution. Press “Mode” key and hold for 2 seconds to enter the “pH Calibration Mode”. A ‘WAIT” icon will flash. The pH/EC80 meter will perform end point sensing to determine when the calibration reading is stable.



3. When the “WAIT” icon disappears, one point/first point calibration is now complete. Press “Mode” key to exit or to wait 5 seconds for the meter to enter two points / second point calibration.

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

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

6. When “WAIT” icon disappears. Three points / third point calibration is now complete. The unit will automatically return to Measure Mode.

Note: For accurate measurements, it is recommended that pH calibration is preformed once a week and after replacing the electrode.

D. Conductivity Calibrate

a. **Preparing Standard Solutions**

Suitable conductivity standards are available commercially or the user can prepare them using research grade reagents.

Here are some standard solutions the user can prepare to calibrate the probe of the model PCE-PH 25.

1. Standard solution of 1413uS at 25°C: Accurately weight out 0.746 grams of research grade dried Potassium Chloride (KCL). Dissolve in 1000ml of distilled water.

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

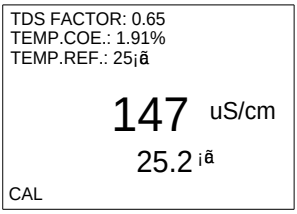
[**Note:** You can store the remaining solution in a plastic container for one week but the air space between the cap and the solution must be kept to an absolute minimum. Storing the excess solution below 4°C can increase the storage life. If you have any doubt of the accuracy of the stored solution,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

b. Conductivity Calibration

1. Press “Mode” key to enter the “Conductivity Measure Mode”.

2. Clean and dip meter into Standard Solution. Allow temperature reading to stabilize. Press and hold “Mode” key for 2 seconds to enter the “Conductivity Calibration Mode”. The “CAL” icon appears on the LCD.

3. Press “Store”, “Scroll” and “Hold” keys to sequentially view previous calibration 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 “Mode” key is pressed instead of the “Hold” key, any changes made will be cancelled 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 “Hold” key to save the new value and the unit will automatically go into the next calibration parameter. If “Mode” key is pressed instead of the “Hold” key, any changes made will be cancelled 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 “Hold” key to save the new value and the unit will automatically go into the next calibration parameter. If “Mode” key is pressed instead of the “Hold” key, any changes made will be cancelled and the previous calibration settings will be retained.

4. Immerse the probe in a standard of known conductivity, preferably a standard in the middle range of the solutions to be measured. Immerse the probe (at least 2” to 3” or 5~7cm 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. After temperature stabilization, 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.

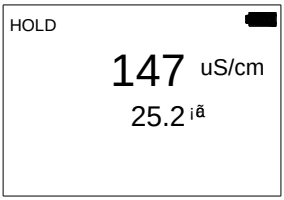
E. Measure

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

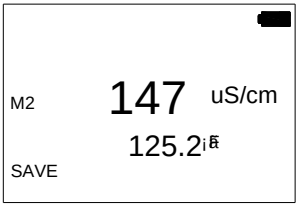
1. When the readings is stable, press “Hold” key once to lock the reading.

2. Press “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 “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 will automatically return to the “Measure Mode” and ready to perform other tasks.



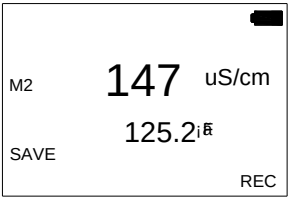
Note: The Model PCE-PH 25 is equipped with a non-volatile memory that can store up to 50 different sets of readings (pH/Conductivity/TDS/Salinity and temperature). Non-volatile memory will be retained even if power is lost. When all 50 memory locations are used up, the next set of data saved will overwrite the data stored in the first location and so on.

H. Recall Data

1. In “Measure Mode”, press and hold “Scroll” key 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, previous saved data will appear.

3. Press “Hold” to exit and return to “Measure Mode”.

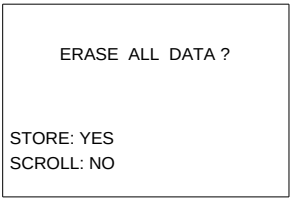


I. Erase Data

1. In “Recall Data Mode”, press “Mode” to enter “Erase Data Mode”.

2. Press “Store” key to erase ALL stored data and return to “Measure Mode.”

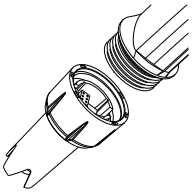
3. Press “Scroll” key to not erase ALL stored data and return to “Measure Mode.”



ONGOING MAINTENANCE

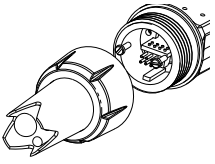
A. Replace Electrode

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



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

3. Insert a new electrode assembly and make sure the electrode fit back into the meter correctly.



4. Screw back the electrode collar.

ERROR DISPLAYS 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.]
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.]

Display Mode	Main Display	Secondary Display	Possible cause(s) [Action(s)]
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.]
Conduc-tivity Measure or Conduc-tivity 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.]
Conduc-tivity 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.]
Conduc-tivity 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

pH

Range	Resolution	Accuracy
0.00 to 14.00 pH	0.01 pH	±0.01 pH

Conductivity

Range	Resolution	Accuracy
0uS/cm to 20.00mS/cm	Minimum 1uS/cm	±1%FS

TDS

Range	Resolution	Accuracy
0mg/L to 20.00g/L	Minimum 1mg/L	±1%FS

Salinity

Range	Resolution	Accuracy
0.0 to 10.0ppt	0.1ppt	±1%FS

Temperature

Range	Resolution	Accuracy
-5.0 to 60.0 °C	0.1 °C	±0.5
23 to 140 °F	0.1 °F	±0.9

pH

pH buffer recognition:
pH 7.00, 4.01, 10.01 or 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: $>10^{12}\ \Omega$

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: At 95%RH

Case: IP67 water-tight case

Dimensions (W x D x H): 44mm x 25mm x200mm

Weight : 110 g (Batteries included)