User Manual

PCE-PH 23 pH Meter

Last change: 14 May 2020
v1.0

Contents

1   Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, …) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

We expressly point to our general guarantee terms which can be found in our general terms of business.

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.

2 Before first use

2.1 Inserting / replacing the batteries

Open the battery compartment cover and insert new batteries. Observe correct polarity. The unit can continue to operate for approximately 2 to 3 hours after the low battery indicator "BAT" appears on the display.

2.2 Soaking the electrode

The electrode must be soaked before first use or after storage. Remove the cover of the pH meter and soak the electrode in a potassium chloride solution with 3mol/l for 2 hours.

3 Device description

3.1 Meter

1. Battery compartment cover
2. LC display
3. Keypad
4. Electrode holder
5. Electrode and unit for automatic temperature compensation (ATC)

The electrode cap is not shown.
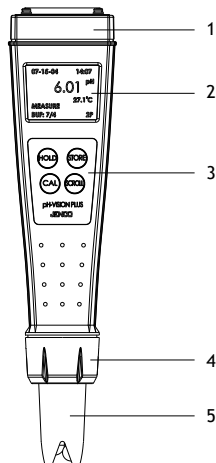
3.2 Display
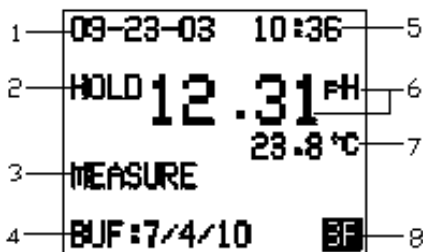
1. DATE   Month-day-year (MM-DD-YY)
2. HOLD   Display for Hold mode
3. MEASURE   Display for measuring mode
4. BUF   Selected buffer solutions
5. TIME   24 hours-minutes (HH:MM)
6. pH   pH reading display
7. °C   Temperature reading display
8. Number of calibration point (1P/2P/3P) or type of calibration

Note: °C or °F is pre-set.

3.3 Operating modes of the meter

1. Measuring mode
   in the measuring mode

2. Calibration mode
   In calibration mode, the 1-point, 2-point or 3-point calibration is performed.

3. Hold mode
   In Hold mode, the measurement is interrupted and the currently measured value is held on the display.

4. Data retrieval mode
   In data retrieval mode, you can display measured values from the memory.

5. Date and time setting mode
   The date and time setting mode is used to correct the time and date.

6. Buffer selection mode for the calibration solutions
   In this mode, the buffer solution set for the calibration is selected: either

   7.00 (pH values 7.00/4.01/10.01) or 6.86 (pH values 6.86/4.00/9.18).

3.4 Key description

Key	Operating mode	Duration of keystroke	Function
HOLD	Any but HOLD mode	2 s or more	Meter on/off
	Measuring mode	0 s	Holds current reading
	Hold mode	0 s	Back to measuring mode
	Date and time setting mode	0 s	Moves cursor to next data entry
CAL	Measuring mode	2 s	Jumps to calibration mode
	Measuring mode	10 s or more	Jumps to date and time setting mode
	Calibration mode	0 s	Leaves calibration mode
	Date and time setting mode	2 s	Leaves date and time setting mode
	Data retrieval mode	2 s	Clears memory and returns to measuring mode
STORE	Measuring mode	2 s	Saves current pH reding along with date and time
	Date and time setting mode	0 s	Increases current reading
	Data retrieval mode	2 s or more	Leaves data retrieval mode
	Buffer selection mode	2 s or more	Leaves buffer selection mode
SCROLL	Measuring mode	2 s	Starts data retrieval mode
	Measuring mode	5 s or more	Starts buffer selection mode
	Data retrieval mode	0 s	Scrolls through saved data
	Date and time setting mode	0 s	Decreases current reading
	Buffer selection mode	0 s	Selects a new buffer solution set

4   Operation

4.1   On / off

Press the HOLD key for 2 seconds or longer. The instrument will enter measurement mode.
To switch off the meter, press the HOLD key again for 2 seconds. The instrument will turn off automatically when no key has been pressed for 10 minutes.

4.2   Set date and time

1. Press the "CAL" key for 10 seconds to start date and time setting mode
2. Press the "HOLD" key to select the date or time value
3. Press the "STORE" or "SCROLL" key to increase or decrease value
4. Press the "CAL" key for 2 seconds
   Exit and return to measuring mode

```
09-18-03  12:45



HOLD  :NEXT SET
STORE :UP
SCROLL:DOWN
CAL   :2SEC EXIT
```

4.3   Select buffer solutions

1. Press "SCROLL" key for 5 seconds to start buffer selection mode
2. Press "SCROLL" key again to select the buffer solution set:
   7.00 for (7.00/4.01/10.01) or
   6.86 for (6.86/4.00/9.18)
3. Press "STORE" for 2 seconds
   Exit and return to measuring mode

```
09-18-03  12:45

CAL  6.86 pH
          25.0°C
SCROLL:SELECT
NEW BUFFER SET
SCROLL:2SEC EXIT
```

4.4   pH value calibration

1. Press the "CAL" key for 2...3 seconds to start calibration mode
2. Immerse the electrode in the 7.00 or 6.86 buffer solution. "WAIT" is displayed.
3. When the "WAIT" indicator disappears, the calibration for this value is finished.
4. Press "CAL" to complete the 1-point calibration or
5. repeat steps 2 and 3 with pH 4.01/4.00 or 10.01/9.18 for 2-point calibration
6. Press "CAL" to complete the 2-point calibration or
7. repeat step 5 for 3-point calibration
8. Automatic return to measuring mode

```
09-15-03  15:42
(LAST CAL DATE)
CAL  7.00 pH
     WAIT  25.0°C
WAIT FOR END
POINT SENSING
BUF:7
```

Note: Clean the electrode with distilled water before each change of calibration solution. For accurate measurement results, it is recommended to perform pH calibration weekly and after each change of electrode.

4.5 Measurement

In measuring mode, immerse the instrument in the liquid to be tested.
Ensure that the electrode is immersed to a maximum of 2 mm below the electrode holder and that there are no solids in the water. These could influence the measurement result.

4.6 HOLD mode

1. When the pH reading is stable, press the "HOLD" key to hold it in the display
2. Press "HOLD" key to continue measurement

Note: In HOLD mode, the meter cannot be turned off.
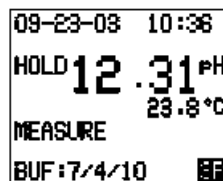
4.7 Saving readings

1. Press the "STORE" key for 2...3 seconds in HOLD mode or measuring mode
2. "DATA SAVE" and "Mxx" indication on the display when data are stored in memory space Mxx
3. The instrument automatically returns to measuring mode.
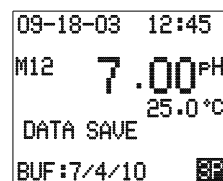
Note: The instrument can store up to 50 measurements. When all memory spaces are occupied, the first memory space is overwritten first, then the following ones.

4.8 Viewing and deleting data

1. Press the "SCROLL" key for 2...3 seconds in measuring mode to call up the last saved measurement
2. Press the "SCROLL" key again to display the previously saved measurement
3. Press "STORE" for 2 seconds
   Exit and return to measuring mode or
4. Press "CAL" key for 2...3 seconds
   Clear memory completely and return to measuring mode
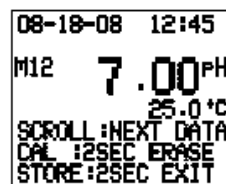
5   Electrode replacement

1. Unscrew electrode holder from the instrument
2. Remove old electrode from holder
3. Place new electrode in the holder
4. Place new electrode on the meter so that the holder fits into the electrode connections
5. Screw electrode holder onto the instrument
6. Soak electrode in 3M KCL for 2 hours
7. Calibrate the meter

6 Error messages

pH display	Temperature display	Mode	Possible causes
Any	"OVER"	Measurement	a) a) Temperature not within the range 0 ... 99.9 °C b) b) No temperature sensor c) c) Temperature sensor defective > Change the temperature of the liquid or > insert new temperature sensor
"OVER"	0 … 99.9°C	Measurement	a) pH value not within the range 0 … 14 b) Meter must be re-calibrated
"OVER"	0 … 60°C	pH calibration	Offset value or slope value of the electrode outside the specified range > Use new buffer solutions > Change the electrode
Any	"OVER"	pH calibration	Temperature of buffer solution not 0...60 °C > Change temperature

7 Specifications

Measuring range pH measurement	0.00 ... 14.00 pH
Resolution pH measurement	0.01 pH
Measuring accuracy pH measurement	± 0.02 pH ± 1 digit
Buffer detection pH measurement	pH 7.00, 4.01, 10.01 or pH 6.86, 4.00, 9.18
Temperature compensation pH measurement	Automatically 0.0 ... 99.9°C / 32 ... 211.8°F
Buffer detection Temperature measuring range	0.0 ... 60°C / 32 ... 140°F
Offset detection pH electrode	± 90 mV at pH 7.00 ± 98.3 mV / -81.7 mV at pH 6.86
Slope pH electrode	± 30% at pH 4.00, 4.01, 9.18, and 10.01
input resistance	> 1012 Ω
Technical Specification for Digital pH Meter PCE-PH 23: Temperature measurement	
Measuring range temperature	0.0 ... 99.9°C / 32 ... 211.8°F
Resolution temperature	0.1°C / 0.18°F
Measuring accuracy temperature	± 0.3°C / 0.5°F
Temperature sensor	Thermistor, 10 kΩ at 25°C
Temperature unit	°C°F, default
General technical specification for the Digital pH Meter PCE-PH 23	
Power supply	4 x LR44
Lifespan batteries	200 hours
Operating temperature	0.0 ... 50.0°C / 32 ... 122°F
Display	98 x 64 pixels, graphic LCD
Casing	ABS, IP67
Weight	107 g / < 1 lb

8   Warranty

You can read our warranty terms in our General Business Terms which you can find here: https://www.pce-instruments.com/english/terms.

9   Disposal

For the disposal of batteries in the EU, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.

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