Klipspringer

Compliance with confidence

pH - Conductivity - Salinity - ORP - mV – Temperature

Multiparameter Testers

INSTRUCTION MANUAL

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Summary

Data Sheet

	PHH-1	PHC-1	PHH-5/7	PHO-4	POP-5	PHC-5	PHM-5	PHM-6
pH Measuring Range	0...14	-	-2...16		-	-	-2...16	
Resolution/Accuracy	0.1 / +0.01	-	0.01 / +0.01		-	-	0.01 / +0.01	
Points of Calibration	1...2	-	1...3		-	-	1...3	
Buffers recognised	3 USA	-	5 USA		-	-	5 USA	
mV (pH) Measuring Range	-	-	-1000... +1000 mV		-	-	-1000... +1000 mV	
Resolution (automatic scale)	-	-	0.1 / 1		-	-	0.1 / 1	
mV (ORP) Measuring Range	-	-	-	-1000... +1000 mV		-	-	-1000... +1000 mV
Resolution (automatic scale)	-	-	-	0.1 / 1		-	-	0.1 / 1
Points of Calibration	-	-	-	1 defined by the user		-	-	1 defined by the user
COND Measuring Range	-	0.01µS... 199.9mS	-	-	-	0.01µS...199.9mS		
Resolution/Accuracy	-	Automatic scale / +2 % f.s.	-	-	-	Automatic scale / +2 % f.s.		
Points of Calibration	-	1...2	-	-	-	1...3		
Temp. Coefficient	-	-	-	-	-	0.00...4.00%/°C		
Reference Temp.	-	25 °C	-	-	-	20/25 °C		
TDS Measuring Range	-	0.01ppm... 199.9 ppt	-	-	-	0.01 ppm...199.9 ppt		
TDS Factor	-	0.40...1.00	-	-	-	0.40...1.00		
Salinity Measuring Range	-	-	-	-	-	0.01 mg/l...100,0 g/l		
Temperature Measuring Range	0...50°C (n.v.)		0...60°C					
Resolution/Accuracy	-		0.1 / +0.2°C					
Measuring Unit	°C/°F							
System Indication of buffers used in calibration	Yes		Yes		-	Yes		
Auto Off	After 8 minutes							
Display	LCD		3 colour LCD backlit display					
IP protection	IP 67							
Power supply	2 x 1.5V AAA batteries							

n.v. – not visible

Introduction

Pocket testers series 1-4-5-6-7 are suited to applications where the fast indication of a measurement is required.

Applications include: Food and beverage manufacturing, Agriculture, water and waste water treatment, Hydroponics, Aquaculture, Environmental monitoring, Cooling towers, Printing, Education etc.

Tester Series 1 has a fixed sensor and two keys for all functions.

Tester Series 4, 5, 6 and 7 are advanced. They feature a sensor, multicolour backlit display, and 3 buttons for all functions.

Safety Instructions

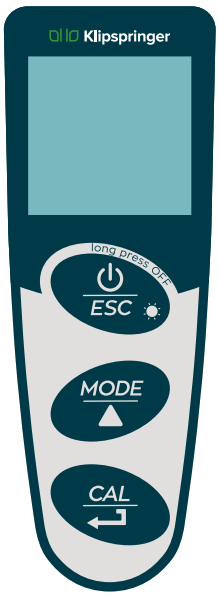
- Read this instruction manual carefully before using your new tester.
- The membrane of the pH electrode is made of glass, so could be a hazard if it breaks. To avoid damage, check the electrode tip after each measurement.
- Replace all batteries with the same type.
- The manufacturer of these instruments cannot be held responsible for any improper use.
- Verification of the measuring results is the responsibility of the operator and the manufacturer is not responsible for any direct or indirect damage occurred while using this instrument.

Product Description

Keypad

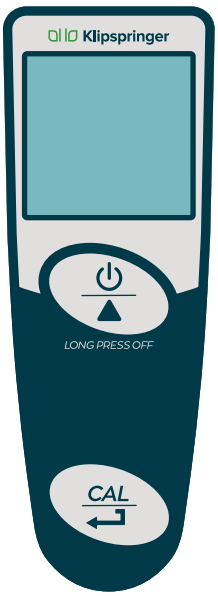
Tester Series 4, 5, 6 and 7

(PHO-4, PHH-5, PHH-7, PHC-5, POP-5, PHM-5 and PHM-6)



Tester Series 1

(PHH-1 and PHC-1)



Keypad Functions for Tester Series 4, 5, 6 and 7

Button	Function	Action
long press OFF ESC	⏻	**Press** to **switch** the **meter on/off**.
	ESC	**Press** to **exit** from **setup menu** or **calibration procedure**.
	✱	During measurement: **Press** to **turn on/off** the **back light**.
MODE ▲	**MODE**	During measurement: **Press** to **switch** between pH -> mV (pH) -> mV (ORP) -> Cond -> TDS -> SAL
	▲	During Setup: **Press** to **scroll** in the **menu** or **increase** the **value** of the selected parameter.
CAL ↵	**CAL**	During measurement: **Press** to **start** the **calibration** of the selected parameter.
	↵	**Press** to **confirm** the **calibration** and **setup value**.

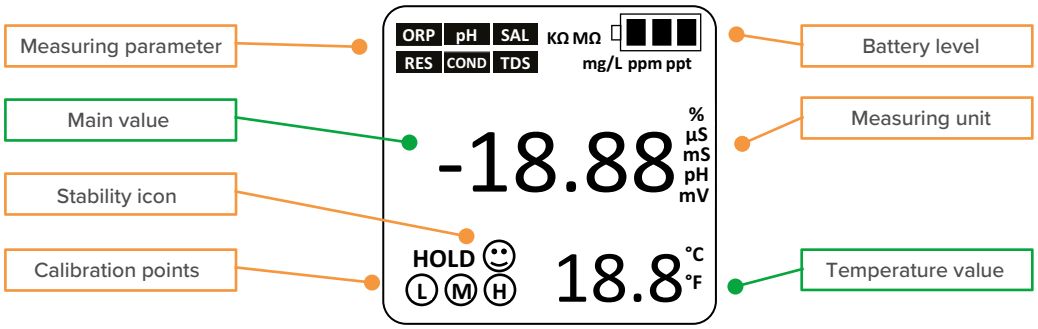
Keypad Functions for Tester Series 1 (pH and Cond)

Button	Function	Action
⏻ ▲ LONG PRESS OFF	⏻	**Press** to **switch** the **meter on/off**.
	▲	During Setup: **Press** to **scroll** in the **menu** or **increase** the **value** of the selected parameter.
CAL ↵	**CAL**	During measurement: **Press** to **start** the **calibration** of the selected parameter.
	↵	**Press** to **confirm** the **calibration** and **setup value**.

Display

The device features an LCD for Series 1. There is a 3-colour backlit LCD for Series 4-5-6-7.

- **GREEN:** Setup or measurement mode
- **BLUE:** Calibration mode
- **RED:** Error/Alarm



Calibration Points Indicator

When a calibration is performed these icons indicate the points calibrated.

Icon	Working range	pH mode	Conductivity mode
Ⓛ	Low	4.01 pH	84 µS
Ⓜ	Medium	7.00 pH*	1413 µS
Ⓗ	High	10.01 pH	12.88 mS

* First point for pH calibration is always 7.00 pH

Note: ORP (Redox) calibration on PHO-4, POP-5 and PHM-6 instruments is possible on only 1 point DEFINABLE by the user. The instruments mentioned are supplied with a 475 mV calibration solution.

Power Supply

The Testers use 2 x 1.5V AAA alkaline batteries (already supplied).

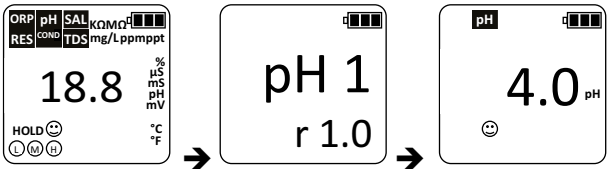
Make sure to insert the batteries in the correct direction, following the indications on the transparent body of the Tester itself.

⚠ Properly dispose of waste batteries according to current legislation.
⚠ Replace all batteries with batteries of the same type.

Instructions for PHH-1 and PHC-1

Power On

Press ⏻ once, the meter will switch on and the display will show all the segments active for 2 sec.
Then, it will display the following:



All segments ON -> model name + software release -> measurement

Power Off

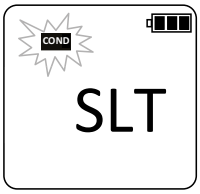
To turn off the meter press ⏻ for 3 seconds, the meter will switch off.

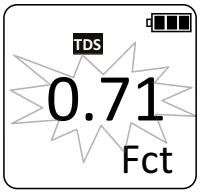
Setup Menu for PHH-1 and PHC-1

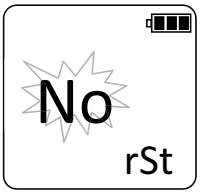
1. If the meter is switched off, press and hold **CAL** and press ⏻ once.
2. The meter will switch on with all the segments active, release **CAL**, the meter will go into the Setup Menu.
3. The display will show SLT on the primary display and **COND** with flash (only for PHC-1).
4. Press ▲ to select the parameter between **COND** or **TDS** that will be used for measurements and press ↵ to confirm (Only for PHC-1).

   Only once **TDS** is selected will the display show TDS Fct flashing. Press ▲ to change this factor, then press ↵ to confirm (Only for PHC-1).
5. The display will show rSt (RESET): **NO** will flash.
6. Press ▲ and select **YES** if a reset of the meter is required. Press ↵ to confirm.
7. At this point, the meter will exit the SETUP menu and will switch off.

Note: To skip the changing of the value, confirm the flashing value with ↵, the meter will go to the next Parameter.







Measurement

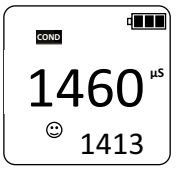
Before taking a measurement, rinse the electrode with distilled water or a sample.

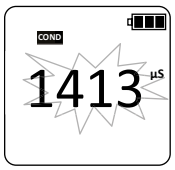
Fill the measuring cap with the sample, switch on the meter with ⏻, immerse the Tester in sample and wait for stability, when the stability icon ☺ appears on the display, take the reading.

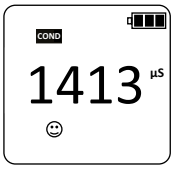
When you are taking a measurement, make sure the pH electrode membrane is free from air bubbles, and that there are not any air bubble around or between the conductivity sensor.

Calibration Procedure for Conductivity (PHC-1)

1. Power ON the meter by pressing the ⏻.
2. Rinse the probe with distilled water.
3. Immerse the probe in the calibration solution (1413µS or 12.88 mS), wait for stability ☺.
4. Press **CAL**.
5. The meter will start the calibration procedure and will recognise automatically the standard used.
6. Once stable, press ↵ to confirm and complete the calibration.
7. The standard value will flash 3 times, then the meter will go into measurement mode.
8. If 2-point calibration is required, rinse the probe with distilled water and immerse in the second standard solution (1413µS or 12.88 mS), wait for stability ☺.
9. Repeat points 4 to 7.
10. The calibration process is complete and the meter is ready to use.







Note: At any time, you can press ⏻ to abort and exit the calibration procedure.

← Reading based on theoretical cell value C=1

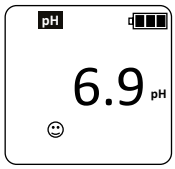
← Standard solution

Calibration Procedure for TDS (PHC-1)

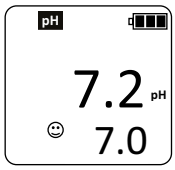
When the meter is set to read **TDS** (see Paragraph 'Setup Menu' on page 7), then the calibration is done on TDS with 1 or 2 points.

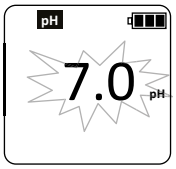
The calibration procedure for TDS is the same as it is for Conductivity.

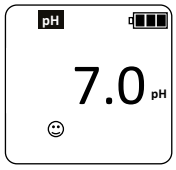
Calibration Procedure for pH (PHH-1)



1. Power ON the meter by pressing the ⏻.
2. Rinse the probe with distilled water.
3. Immerse the electrode in the first buffer solution pH7.0 and wait for stability ☺.
4. Press **CAL**.
5. The meter will start calibration procedure and will recognise automatically the standard used.
6. Once stable, press ↵ to confirm and complete the calibration.
7. The standard value will flash for 3 times, then the meter will ask for the next point of calibration. If only 1-point calibration is required, press ⏻ to finish and exit.
8. If 2-point calibration is required, rinse the electrode with distilled water and immerse in pH4.0 or pH10.0, wait for stability ☺.
9. Repeat points 4 to 7.
10. The calibration process is complete and the meter is ready to use.







Note 1: At any time, you can press ⏻ to abort and exit the calibration procedure.

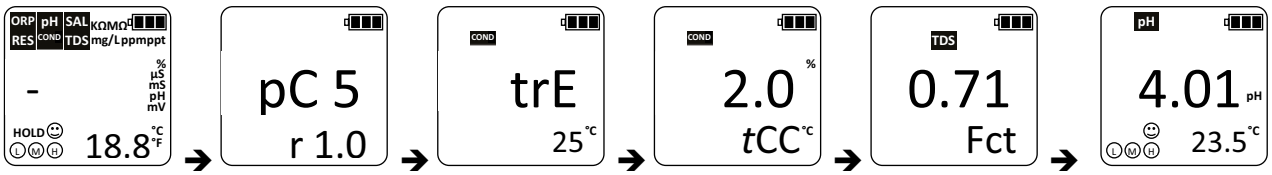
Note 2: When the first point calibration is confirmed (point 7) if the sensor is not removed from the buffer solution, the instrument may show the wrong buffer error.

Instructions for PHH-5/7, PHC-5, PHO-4, POP-5 and PHM-5/6

Power On

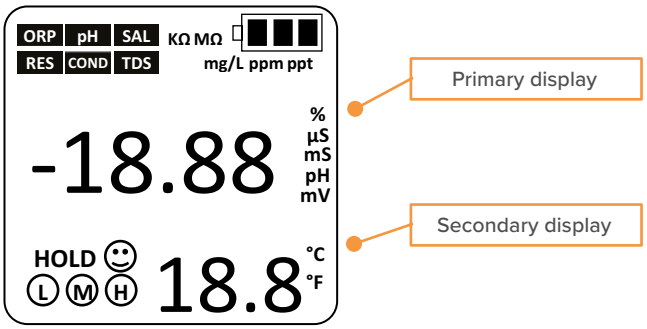
Press ⏻ once, the meter will switch on and perform a test of the 3-colour backlit display. It will then show all the segments as active for 2 sec.

Then, it will display the following:



Setup Menu for PHH-5/7, PHC-5, PHO-4, POP-5 and PHM-5/6

1. With meter switched off, press and hold **CAL** and press ⏻ once.
2. The meter will switch on, with all the segments active, release **CAL**, the meter will go into the Setup Menu (green backlight during setup).
3. Press ▲ to select the parameter to be changed between:



Function	Primary display	Secondary display	Default value
Temperature unit (°C/°F)	t. U.	-	°C
Reference temperature for conductivity	trE	20 - 25 °C	25°C
Coefficient for temperature compensation	0...4 %/°C	tCC	1.91
TDS Factor	0.40 - 1.00	Fct	0.71
Reset to factory default	NO - YES	rSt	NO

4. Press ↵ to enable the value changing of the selected parameter.
5. The value of selected parameter will start flashing
6. Press ▲ to change the value, then press ↵ to confirm.
7. The value stops flashing.
8. Press ▲ to select other parameters or press **ESC** to exit the setup menu.

Note: At any time you can press **ESC** to exit from the SETUP menu.

Measurement

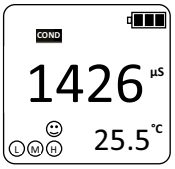
Before taking a measurement, rinse the electrode with distilled water or a sample.

Fill the measuring cap with the sample, switch on the meter with ⏻ and press **MODE** to select the desired parameter to be measured (green backlight during measurement).

Immerse the Tester in the sample and wait for stability, when stability icon ☺ appears on the display, take the reading.

When you are taking a measurement, make sure the pH electrode is free from air bubbles, and that there are not any air bubbles around or between the conductivity sensor.

Calibration Procedure for Conductivity (PHC-5 and PHM-5/6)

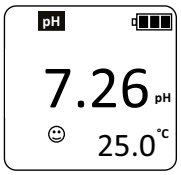


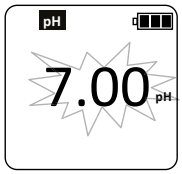
1. Power ON the meter by pressing the ⏻.
2. Rinse the probe with distilled water.
3. Immerse the probe in the calibration solution (84µS or 1413µS or 12.88mS), wait for stability ☺.
4. Press **CAL** (blue backlight during calibration).
5. The meter will start the calibration procedure and will automatically recognise the standard used.
6. Once, stable press ↵ to confirm and complete the calibration.
7. The standard value will flash 3 times, then the meter will go into measurement mode.
8. If the 2-point calibration is required, rinse the electrode with distilled water and immerse in the second Standard, wait for stability ☺.
9. Repeat points 4 to 7.
10. If the 3-point calibration is required, rinse the electrode with distilled water and immerse in the third Standard, wait for stability ☺.
11. Repeat points 4 to 7.
12. The calibration process is complete and the meter is ready to use.

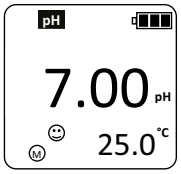
Note 1: At any time, you can press **ESC** to abort and exit from the calibration procedure.

Note 2: If you are performing a multipoint calibration, it is better to start from the lower value standard first and then increase.

Calibration Procedure for pH (PHO-4, PHH-5/7 and PHM-5/6)







1. Power ON the meter by pressing the ⏻.
2. Rinse the probe with distilled water.
3. Immerse the electrode in the first buffer solution pH7.00 and wait for stability ☺.
4. Press **CAL** (blue backlight during calibration).
5. The meter will start the calibration procedure and will automatically recognise the standard used.
6. Once stable ☺, press ↵ to confirm and complete the calibration.
7. The standard value will flash 3 times, then the meter will ask for next point for the calibration. If only 1-point calibration is required, press ⏻ to finish and exit.
8. If the 2-point calibration is required, rinse the electrode with distilled water and immerse in pH4.01 or pH10.01, wait for stability ☺, otherwise press **ESC** to finish and exit.
9. Repeat points 4 to 7.
10. If the 3-point calibration is required, rinse the electrode with distilled water and immerse in the last buffer, wait for stability ☺, otherwise press **ESC** to finish and exit.
11. Repeat points 4 to 7.
12. The calibration process is complete and the meter is ready to use.

Note: Anytime press **ESC** to abort and exit from calibration procedure.

Calibration Procedure for ORP (PHO-4, POP-5 and PHM-6)

1. Switch on the instrument by pressing ⏻.
2. Rinse the electrode with distilled water and pat dry gently.
3. Immerse the electrode in the available ORP (Redox) solution (475 mV), wait for stability ☺.
4. Press **CAL** (LED Blue backlight).
5. The instrument will enter calibration mode and recognise the ORP (Redox) solution, with a set degree of uncertainty.

6. At the center of the display, the value flashes to indicate that it can be adjusted by the user. This adjustment allows for a variation of ±75 mV from the value shown during calibration. To make this adjustment, press and hold the **MODE** button. Initially, the value will change in single units; if you continue holding the button, it will begin to change in increments of ten.

Note: This procedure allows user to adjust reading upwards only. If displayed reading during calibration is higher than reference value (490 mV in 475 mV calibration solution) keep pressing **MODE** until required value is achieved (taking into account that max adjustment is -75 mV).

7. Press ↵ to confirm and complete the calibration.
8. Once the calibration is complete, the instrument will automatically return to measuring mode.

Note: Press ⏻ at any time to exit the calibration.

Power Off

To turn off the meter press ⏻ for 3 seconds, the meter will switch off. The instrument cannot be switched off during calibration.

Replacement of Sensor

Tester Series 4-5-6-7 series have replacement sensors which can be replaced if damaged.

1. To replace the sensor, unscrew the dial in an anti-clockwise direction.
2. Pull the sensor away for the body of the unit.
3. Correctly matching the sign of dent, attach the new sensor.
4. Make sure that all the gaskets are in the correct position.
5. Screw the dial tightly.

⚠ Sensor Maintenance

If the probe has spent a long time in dry storage conditions, leave it in STORAGE Solution (or pH 4) for at least 30 minutes to reactivate the sensor.

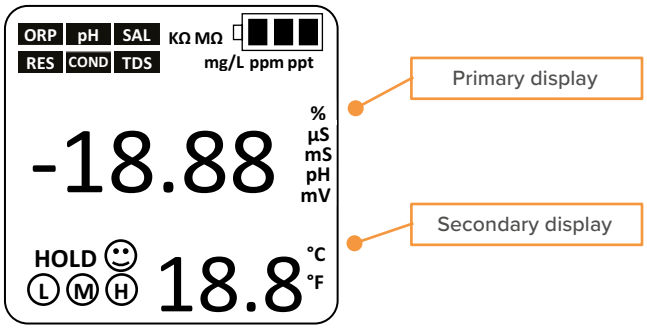
PHC-1 and PHC-5

- Once the sensor has been rinsed with distilled water store it dry after each use.
- **Never touch the conductivity probe with paper or any tools (especially the internal part). When cleaning, only rinse with distilled water. Otherwise the probe may be damaged.**

PHH-1/5/7, PHM-5/6, POP-5 and PHO-5

- Rinse the probe with distilled water before each use.
- Once the sensor has been rinsed with distilled water, store it in STORAGE Solution (or pH 4).
- **Never store the pH sensor in distilled water!**

Setup Menu Functions for all Testers



Function	PHH-1	PHC-1	PHH-5/7, POP-5, PHO-5	PHC-5	PHM-5/6	RESET
COND / TDS selection	-	✓	-	✓	✓	-
TDS factor	-	0.40 - 1.00	-	0.40 - 1.00	0.40 - 1.00	0.71
°C / °F	✓ n.v.	✓ n.v.	✓	✓	✓	°C
T ref for COND	-	25 °C	-	20 / 25 °C	20 / 25 °C	25 °C
T Coefficient	-	1.91%	-	0... 4.00% / °C	0... 4.00% / °C	1.91%
RESET	✓	✓	✓	✓	✓	/

n.v. – not visible

Error Description

Error	Contents	Checking
Er1	Wrong pH buffer solution. Or, the calibration solution is out of range	1. Check whether the buffer solution is correct. 2. Check whether the meter is fully connected to the electrode. 3. Check for electrode damage.
Er2	Press ↵ when measuring value is not stable during calibration.	Press ↵ when ☺ icon appears.
Er3	During calibration, the measuring value is not stable for ≥3min.	1. Check whether there are bubbles in the glass bulb. 2. Replace with new electrode.
Er4	Electrode has zero electric potential out of range (<-60mV or >60mV)	1. Check whether there are bubbles in the glass bulb. 2. Check whether the pH buffer solution is correct. 3. Replace current electrode with new pH electrode.
Er5	Electrode slope out of range (<85%or >110%)	
Er6	pH measuring range out of range (<0.00 pH or >14.00pH) 1 Series (<-2.00 pH or >16.00pH) 5 Series	1. Check whether the electrode is suspended. 2. Check whether the meter is fully connected to the electrode. 3. Check for electrode damage.

Disposal of electronic devices

Electrical and electronic equipment marked with this symbol cannot be disposed of in public landfills.

According to the UE Directive 2002/96/EC, the European users of electrical and electronic equipment can return it to the dealer or manufacturer upon purchase of new equipment.

The illegal disposal of electrical and electronic equipment is punished with an administrative fine.

Version 1 - May 2025