

WalkLAB

MICROCOMPUTER pH METER TI9000

OPERATIONS MANUAL



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1. INTRODUCTION

Your TI9000 pH Meter utilizes an advanced Microprocessor chip as the heart and brain of the Instrument. It incorporates Analog/Digital Converter, Computing, and Display into one micro-chip. This increases the reliability and greatly reduces the power consumption.

1.1 Features

Low Power Consumption

Unit requires only 0.018mA in "OFF" and "AUTOLOCK" mode and 2.2mA while on "READ" mode or 250 hours of continuous operations in "READ" mode.

Ease of use

Automatically lock reading when a stable reading is established. Feature can be disabled to allow continuous reading display.

Automatic shut-off

Meter automatically shuts off after 5 minutes after last key command. Feature can be disabled while reading in continuous read mode.

One-touch calibration

The meter's one-touch auto-calibration procedure uses only one button to activate the mode. The unit will prompt and confirm offset and slope point calibration.

1.2 Technical Specifications

	Range	Resolution	Accuracy
pH	0.00 to 14.00	0.01pH	±0.01pH
mV	-999 to +999	1mV	±1mV
Temp	0° to 99.9 °C	0. 1°C	0. 5°C

Automatic Temperature Compensation : 0° to 99.9 °C

Buffer Recognition : pH 7, pH 4 or pH 10

Buffer Temperature Range : 0° to 60° C

Electrode Slope Recognition : ±20% at pH 4 or pH 10 @25° C

Electrode Offset Recognition : ±60 mV at pH 7 @25° C

Power Source : 9 Volt Alkaline Battery

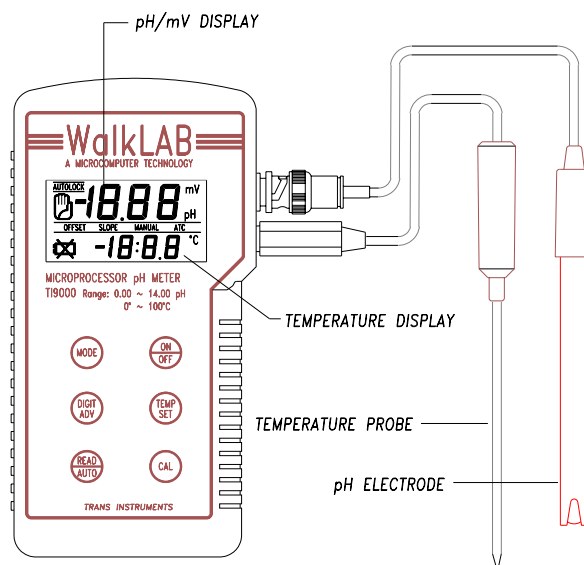
Battery Life : 250 Hrs Continuous Reading

Size : 163 x 83 x 32 mm

Weight : Approx. 350g

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2. FRONT PANEL DESCRIPTION



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2.1 DISPLAY SYMBOL



- Wait indicator

AUTOLOCK - Stabilized reading indicator

MANUAL - Manual temperature compensation mode indicator

ATC - Automatic temperature compensation mode indicator

OFFSET - Calibration mode offset point indicator

SLOPE - Calibration mode slope point indicator



- Low Battery indicator

2.2 TOUCH KEYS

ON/OFF

The ON/OFF key turns the instrument on and off. When ON, display will show the present reading in AUTOLOCK mode.

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MODE

The MODE key selects reading from pH to mV display. During calibration, MODE selection will be temporarily disabled.

READ/AUTO

The READ/AUTO key activates input of pH or mV reading and will autolock when reading is stable. To enable continuous reading, press and hold this key for 3 seconds. To return to AUTOLOCK reading, press the key once. (Note: in continuous reading mode, automatic shut-off is disabled).

CAL

The CAL key activates calibration mode. Press once and the display will prompt for the calibration steps.

TEMP SET and DIGIT ADV

The TEMP SET and DIGIT ADV Key are used to set temperature compensation manually. Press TEMP SET key once will allow selection of digit to flash momentarily. Press again, the next digit will flash. Select the digit you wish to change while it flashes and press the DIGIT ADV key to advance the digit. Digit will advance at each press of the key. Digit will not advance by double pressing or press and hold the key.

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2.3 ERROR CODES

- ER 1** – pH out of range : - pH less than 0.00 or more than 14.00 pH.
mV out of range : - mV less than –999 or more than +999 mV.
- ER 2** – Calibration buffer solution's temperature below 0°C or above 60°C.
- ER 3** – Test sample solution's temperature below 0°C or above 60°C.
- ER 4** – Unrecognized OFFSET standard solution or unstable readings:-
Wrong calibration buffer solution 7.00pH.
Bad pH electrode results in erratic readings.
Large fluctuation of temperature readings.
- ER 5** – Unrecognized SLOPE standard solution or unstable readings:-
Wrong calibration buffer solution 4.01pH.
Wrong calibration buffer solution 10.01pH.
Bad pH electrode results in erratic readings.
Large fluctuation of temperature readings.

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3. GETTING STARTED

3.1 Unpacking

Your instrument is shipped with a pH electrode, a temperature probe, buffer solution pH 7.00 , buffer solution pH 4.01 and this manual. Check the items carefully and contact the place of purchase immediately if anything is missing or damaged.

3.2 Setting Up

- 3.2.1 Pull the latch of battery cover located at bottom rear of instrument and pull out the battery. Unwrap the battery, attach the battery clip onto it and put it back into the battery compartment. Finally close the battery cover.
- 3.2.2 Plug the temperature probe and pH electrode into their respective connectors on the side of the instrument.
- 3.2.3 Next, you must calibrate the instrument. Follow the calibration procedure in step 4. Always switch on the instrument for about 10 minutes to allow the internal circuitry to stabilize before taking any calibration or measurement

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4. CALIBRATION PROCEDURE

To keep measurement accurate and precise, it is best to calibrate the instrument each time before a series of measurements. Use standard buffer solution with temperature coefficient as in Buffer Solution Reference Table (Page 16). Prepare one distilled or de-ionised water for rinsing and two sets of buffer solution, one for rinsing and the other for calibration. This will prevent carry-over of solution during calibration.

4.1 Calibration with Temperature Probe

- 4.1.1 Rinse the pH electrode and temperature probe in distilled water and switch on the instrument. OFFSET and SLOPE indicator will alternate if no calibration is registered in the memory.
- 4.1.2 Press the CAL key. The OFFSET indicator will flash momentarily.
- 4.1.3 Rinse the pH electrode and temperature probe in pH 7.00 rinsing solution and dip into pH 7.00 calibration solution. Once the instrument detected the correct offset buffer, the OFFSET indicator will stop flashing and the offset reading will be displayed.

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- 4.1.4 Now the instrument is performing a multiple data sampling. It will take a little longer time for an accurate calibration point.
- 4.1.5 When OFFSET point is established, the instrument will beep and the SLOPE indicator will flash.
- 4.1.6 Rinse the pH electrode and temperature probe in distilled water and then pH 4.01 or 10.01 rinsing solution. Dip the pH electrode and temperature probe in pH 4.01 or 10.01 calibration solution.
- 4.1.7 The SLOPE indicator will stop flashing when the instrument detects the correct slope buffer and will display the buffer reading.
- 4.1.8 When the SLOPE point is established, the instrument will beep and AUTOLOCK indicator appears. Calibration is completed.
- 4.1.9 For every successive calibration, the instrument will retain the last calibration data until the next calibration.

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4.2 Calibration without Temperature Probe

- 4.2.1 Remove the temperature probe connected to the instrument. The temperature display will show a default reading of 25.0°C.
- 4.2.2 Set the instrument to display the temperature of the buffer 7.00 by pressing the TEMP SET key once. The temperature digit will flash momentarily. Press the key again, the next digit will flash. Select the digit you wish to change while it flashes and press the DIGIT ADV key to advance the digit. Digit will advance at each press of the key. Digit will not advance by double pressing.
- 4.2.3 After setting the temperature, rinse the pH electrode in distilled water. Dip the pH electrode into the pH 7.00 rinsing solution and then into the pH 7.00 calibration solution and press the CAL key. The OFFSET indicator will flash momentarily. Once the instrument detected the correct offset buffer, the OFFSET indicator will stop flashing and offset value will be displayed.
- 4.2.4 Now the instrument is performing a multiple data sampling. It will take a little longer time for an accurate calibration point.

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5. MEASUREMENT

For an accurate measurement, prepare a rinsing distilled water and two test sample solutions – one for rinsing and the other for testing. This will prevent carry-over of solution during testing.

5.1 pH Measurement with Temperature Probe

- 5.1.1 Rinse the pH electrode and temperature probe in distilled water and switch on the instrument.
- 5.1.2 Rinse the pH electrode and temperature probe in the first test sample solution and then dip in another test sample solution and press READ/AUTO key.
- 5.1.2 The Wait indicator will flash momentarily until reading is stabilized. The instrument will beep and the 'AUTOLOCK' indicator appears. Reading is established.
- 5.1.3 To disable the AUTOLOCK feature and enable continuous reading, press and hold the READ/AUTO key for 3 seconds. To resume to the AUTOLOCK mode, press the READ/AUTO key once.

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- 4.2.5 When OFFSET point is established, the instrument will beep and the SLOPE indicator will flash.
- 4.2.6 Repeat step 4.2.2 to set the temperature of the slope buffer if required.
- 4.2.7 Rinse the pH electrode in distilled water and then pH 4.01 or 10.01 rinsing solution. Dip the pH electrode in pH 4.01 or 10.01 calibration solution.
- 4.2.8 The SLOPE indicator will stop flashing when the instrument detects the correct slope buffer and will display the buffer reading.
- 4.2.9 When the SLOPE point is established, the instrument will beep and the 'AUTOLOCK' indicator appears. Calibration is completed.
- 4.2.10 For every successive calibration, the instrument will retain the last calibration data until the next calibration.

TERMINATION DURING CALIBRATION

If you wish to abort a calibration or if you have accidentally activated the CAL key, press the READ/AUTO key to abort the calibration and return to read mode.

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- 5.1.4 If reading is erratic or unstable, instrument will not be able to AUTOLOCK the reading. This can be the result of a worn-off or bad pH electrode.

5.2 pH Measurement without Temperature probe

- 5.2.1 Remove the temperature probe connected to the instrument. The temperature display will show a default reading of 25.0°C.
- 5.2.2 To set a known temperature reading, press the TEMP SET key once. The temperature digit will flash momentarily. Press again, the next digit will flash. Select the digit you wish to change while it flashes and press DIGIT ADV key to advance the digit. Digit will advance at each press of the key. Digit will not advance by double pressing.
- 5.2.3 After setting the temperature, dip the pH electrode into the rinsing solution and then into the test solution and press the READ/AUTO key.
- 5.2.4 The Wait indicator will flash momentarily until reading is stabilized, the instrument will then beep and 'AUTOLOCK' indicator appears. Reading is established.

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- 5.2.5 To enable continuous reading, press and hold the READ/AUTO key for 3 seconds. To resume to AUTOLOCK mode, press the READ/AUTO key once.

5.3 Temperature Measurement

- 5.3.1 The instrument can be used to measure temperature independently with the temperature probe.
- 5.3.2 When measuring temperature independently, remove the pH electrode connected to the instrument.
- 5.3.3 Press the READ/AUTO key for 3 seconds to activate continuous reading mode. Error code may appear on pH display but will not affect the temperature reading.
- 5.3.4 Allow some time for the temperature reading to stabilize before taking the measurement value.

5.4 mV Measurement

The instrument mV measuring function allows ORP, ion-selective mV and others mV measurements.

- 5.4.1 Replace the pH electrode with the measuring electrode.
- 5.4.2 Rinse the measuring electrode in distilled water and switch on the instrument.
- 5.4.3 Rinse the measuring electrode in test sample solution and then in another test sample solution and press the READ/AUTO key.
- 5.4.4 The Wait indicator will flash momentarily until reading is stabilized. The instrument will beep and the 'AUTOLOCK' indicator appears. Reading is established.
- 5.4.5 To disable the AUTOLOCK feature and allow continuous reading, press and hold the READ/AUTO key for 3 seconds until a beep sound is heard. To resume to AUTOLOCK mode, press the READ/AUTO key once.
- 5.4.6 If reading is erratic or unstable, the instrument will not be able to AUTOLOCK the reading. This can be the result of a worn-off or bad electrode.

6. BUFFER SOLUTION REFERENCE TABLE

While using standard buffer solutions for calibration, use only Buffer solution with the following temperature coefficient for accurate calibration:-

Temperature (°C)	Buffer 7 (pH)	Buffer 4 (pH)	Buffer 10 (pH)
0	7.11	4.00	10.32
5	7.08	4.00	10.25
10	7.06	4.00	10.18
15	7.03	4.00	10.12
20	7.01	4.00	10.06
25	7.00	4.01	10.01
30	6.98	4.02	9.97
35	6.98	4.02	9.93
40	6.97	4.03	9.89
45	6.97	4.04	9.86
50	6.97	4.06	9.83
55	6.97	4.07	9.80
60	6.98	4.10	9.78

7. OPTIONAL ACCESSORIES

Description	Order Code
PH Electrode	- PE-02
ORP Electrode	- ORP106
Temperature probe	- TP-200
Buffer Solution pH 7.00	- 7010
Buffer Solution pH 4.01	- 4010
Buffer Solution pH 10.01	- 1010

8. WARRANTY

Trans Instruments (S) Pte. Ltd. warrants this product for a period of one year from the date of purchase against all defects in material and workmanship. This warranty does not apply to the abuse and misuse of the instrument. If repairs or adjustments are required, please return the defective instrument freight prepaid. Instrument within warranty will be repaired at no charge. Make sure that the instrument is properly packed and insured against possible damage or loss in shipment. Purchase invoice **MUST** accompany returned product or else warranty is considered void.

Authorization must be obtained from Trans Instruments (S) Pte. Ltd. or your Local Sales Representative prior to the return.