

OPERATION MANUAL

THE JENCO MODELS 5000 SERIES PORTABLE pH METER

JENCO ELECTRONICS, LTD.

MANUFACTURER OF PRECISION INSTRUMENTS

GENERAL INTRODUCTION

The models 5000 series are high performance, low cost, general purpose portable instrument for the measurement of pH, mV and temperature.

The 5000 series offer different accuracies and resolutions for all levels of pH applications. The low end 5001 is for pH measurements only, with 0.05 pH resolution and 0.03 \pm 1 digit pH accuracy. The high end model 5005 measures pH, mV and temperature to 0.01 pH, 1 mV and 0.1 with accuracies of 0.01 pH, 0.1% mV and 0.5 .

The compact design of the 5000 series allow the instruments to be used in the field with a rugged carrying case, buffer solutions and it's internal battery as well as in the laboratory with a built-in tilt stand and UL/CSA approved AC adaptor.

Analog output is provided for the models 5002, 5003 and 5005.

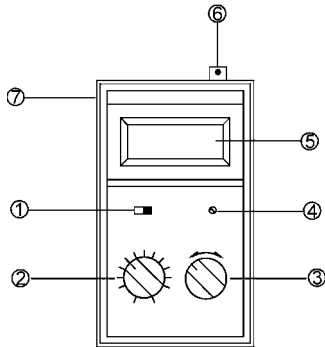
INITIAL INSPECTION

Carefully unpack the instrument and accessories. Inspect for damage in shipment. If any damage is found, NOTIFY YOUR JENCO REPRESENTATIVE IMMEDIATELY. All packing materials should be saved until satisfactory operation is confirmed.

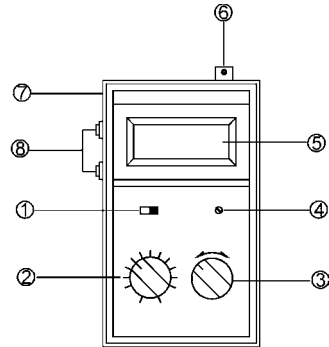
SPECIFICATIONS

Model No.	5001	5002	5003	5004	5005
	pH	pH	pH/mV	pH/Temp	pH/mV/Temp
Range					
pH	0-14	0-14	0-14	0-14	0-14
mV	N/A	N/A	§ 1999	N/A	+1999
Temp()	N/A	N/A	N/A	-199.9-199.9	0-100.0
ATC	N/A	N/A	N/A	N/A	0-14
Resolution					
pH	0.05	0.01	0.01	0.01	0.011
mV	N/A	N/A	1	N/A	1
Temp()	N/A	N/A	N/A	0.1	0.1
ATC	N/A	N/A	N/A	N/A	0.01
Accuracy					
pH	ATC	N/A	N/A	0.01 § 1digit	N/A
mV	0.03 § 1digit	N/A	N/A	0.1% § 1digit	0.01 § 1digit
Temp()	N/A	0.01 § 1digit	N/A	N/A	N/A

	0.5 § 1digit	N/A	0.01 § 1digit	0.1% § 1digit	0.5 § 1digit	0.1% § 1digit
Model No.	5001		5002	5003	5004	5005
	pH		pH	pH/mV	pH/Temp	pH/mV/Temp
Temperature Comp.						
Manual	0 to100		0 to100	0 to100	0 to100	0 to100
Auto	N/A		N/A	N/A	N/A	0 to100
Analog Output						
pH	N/A		§ 70mV	§ 70mV	N/A	0-1400mV
mV	N/A		N/A	§ 199.9mV	N/A	§ 1999mV
Temp	N/A		N/A	N/A	N/A	0-1000mV
ATC	N/A		N/A	N/A	N/A	0-1400mV
Slope Adjust	Yes		Yes	Yes	Yes	Yes
Readout	12.7 mm LCD		12.7 mm LCD	12.7 mm LCD	12.7 mm LCD	12.7 mm LCD
Input impedance:	Greater than 10 to the 12th ohms					
Power:	1 ⊙ 9V battery or optional A/C adaptor					
Battery life:	100 hours typical, alkaline battery					
Input jack	BNC		BNC	BNC	BNC	BNC
Meter weight	0.32kg		0.32kg	0.32kg	0.32kg	0.4kg



1. ON/OFF switch
3. STANDARDIZE control
5. LCD display
7. AC adaptor input connector



2. TEMPERATURE control
4. SLOPE control
6. BNC connector
8. Analog output connectors
(Model 5002 only)

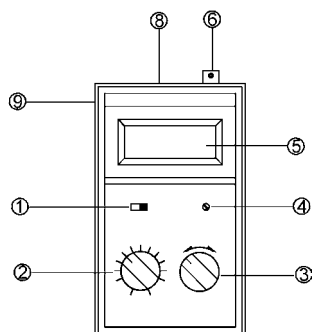
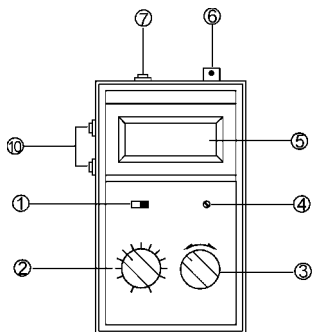


FIGURE 1 FRONT VIEW FOR MODELS 5001, 5002

- 1. MODE switch
- 3. STANDARDIZE control
- 5. LCD display
- 7. Reference PIN connector

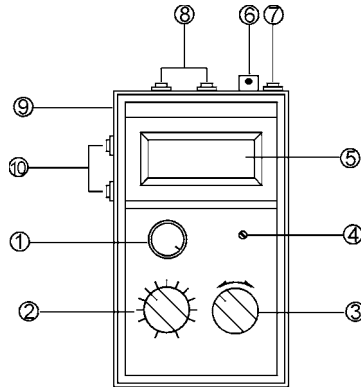
- (Model 5003 only)
- 9. AC adaptor input connector
- 2. TEMPERATURE control

- 4. SLOPE control
- 6. BNC connector
- 8. Temperature input connector

- (Model 5004 only)
- 10. Analog output connectors
- (Model 5003 only)

FIGURE 2 FRONT
5003, 5004

VIEW FOR MODELS

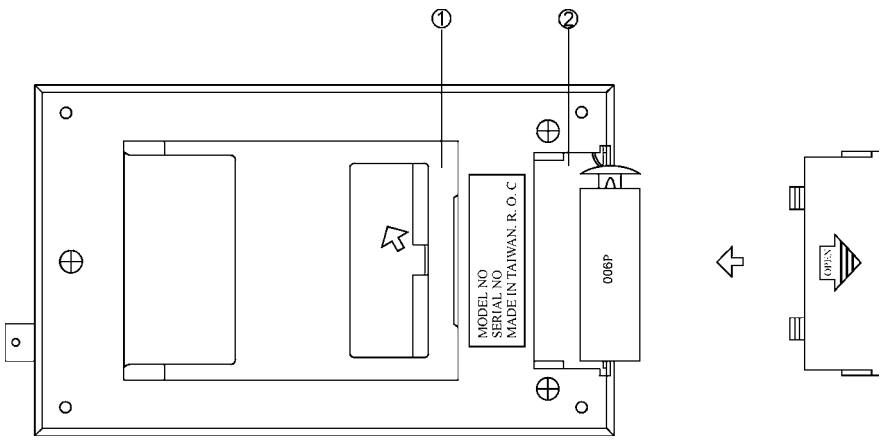


1. MODE switch

3. STANDARDIZE control

- 5. LCD display
- 7. Temperature input connector
- 9. Analog output connectors
- 2. TEMPERATURE control
- 4. SLOPE control
- 6. BNC connector
- 8. AC adaptor input connector

FIGURE 3 FRONT VIEW FOR MODEL 5005



1. Tilt stand

2. Battery compartment

FIGURE 4 REAR VIEW

INPUT POWER

The models 5000 series can be used with 115 volt or 230 volt UL/CSA approved AC line adaptors as well as the internal 9 volt battery. Check the label on the AC adaptor supplied for the AC line voltage. If the wrong AC adaptor is supplied, notify your Jenco Representative immediately. **DO NOT USE THE INSTRUMENT WITH AC LINE. OPERATE WITH THE INTERNAL BATTERY ONLY.**

BATTERY REPLACEMENT

1. Replace battery when the LO BAT indicator on the LCD display is ON. The instrument can operate within specifications for approximately one hour after LO BAT appears.
2. Remove the battery cover to expose the battery compartment.(REFER TO FIGURE4)
3. Replace the 9 volt battery.
4. Replace the battery cover.

TURN OFF INSTRUMENT

When the instrument is not in use, turn off the instrument with ON/OFF switch. Un-plugging the AC adaptor from the instrument or from the AC line does not turn off the instrument. It would automatically switch to the internal battery. The instrument will continue to operate on the internal battery.

pH CALIBRATION

Connect the AC adaptor to the AC power line. Make sure that the correct AC adaptor is used. It is recommended to conserve the internal battery by using AC power whenever it is available.

(REFER TO FIGURE 1, FIGURE 2, FIGURE 3)

1. Connect the pH electrode to the instrument.
2. Rinse the pH electrode in distilled water and immerse in pH buffer 7.00.
3. Set the MODE switch to pH, where applicable. Set the TEMPERATURE control on the front panel to that of the buffer 7.00.
4. Adjust the STANDARDIZE control for the instrument to read the buffer value corresponding to the temperature of the buffer set in 3. (REFER TO TABLE 1) Allow sufficient time for the pH electrode to stabilize.
5. Remove the pH electrode from buffer 7.00. Rinse with distilled water and immerse in

- buffer 4.01. Set the TEMPERATURE control to the temperature of the buffer 4.01.
- Adjust the SLOPE control for the instrument to indicate the value of the buffer 4.01 corresponding to the buffer temperature set in 5. (REFER TO TABLE 1) Allow sufficient time for the pH electrode to stabilize.
 - Rinse the electrode with distilled water. The instrument is dual point standardized and ready for measurements.

pH CALIBRATION IN THE ATC MODE

This section is for the model 5005 only. (REFER TO FIGURE 3)

- Connect the electrode and temperature probe to the instrument.
- Rinse the electrode and temperature probe in distilled water and immerse in pH buffer 7.00. Allow sufficient time for the electrode and temperature probe to reach temperature equilibrium with the buffer.
- Set the MODE switch to TEMP to display the buffer temperature.
- Set the MODE switch to ATC. Adjust the STANDARDIZE control for the instrument to indicate the buffer value corresponding to the buffer temperature measured in 3. (REFER TO TABLE 1)
- Remove the electrode and temperature probe from buffer 7.00. Rinse with distilled water and immerse in buffer 4.01. Allow sufficient time for the electrode and temperature probe to reach temperature equilibrium with the buffer.

6. Set the MODE switch to TEMP to display the buffer temperature.
7. Set the MODE switch to ATC. Adjust the SLOPE control for the instrument to indicate the buffer value corresponding to the buffer temperature measured in 6. (REFER TO TABLE 1)
8. Rinse the electrode and temperature probe with distilled water. The instrument is dual point standardized and ready for measurements.

pH MEASUREMENTS

The instrument must be dual point calibrated for accurate pH measurements. (REFER TO FIGURE 1, FIGURE2, FIGURE3)

1. Connect the pH electrode to the instrument.
2. Rinse the pH electrode with distilled water and immerse it in the sample to be measured.
3. Set the MODE switch to TEMP to measure the temperature of the sample.(FOR MODELS 5004 AND 5005 ONLY)
4. Set the TEMPERATURE control to the temperature of the sample.
5. Allow sufficient time for the instrument to stabilize. The instrument will display the pH value of the sample at the sample temperature.

pH MEASUREMENTS IN THE ATC MODE

The instrument must be dual point calibrated in the ATC mode for accurate pH measurements.

This section is for the model 5005 only. (REFER TO FIGURE 3)

1. Connect the electrode and temperature probe to the instrument.
2. Set the MODE switch to ATC.
3. Rinse the pH electrode and temperature probe with distilled water and immerse in the sample to be measured.
4. Allow sufficient time for the instrument to stabilize. The instrument will display the pH value of the sample at the sample temperature.

mV MEASUREMENTS FOR MODEL 5003 AND 5005

1. Set the MODE switch to mV.
2. Connect the working electrode to the input BNC connector and the reference electrode to the Reference PIN connector.
3. Rinse the working and reference electrodes with distilled water and immerse the two electrodes in the sample to be measured.

4. Allow sufficient time for the instrument to stabilize. The instrument will display the millivolt value of the sample.
5. The temperature probe can be used to measure the sample temperature as required. (MODEL5005 ONLY)

TEMPERATURE MEASUREMENTS

This section is for the models 5004 and 5005 only.

1. Set the MODE switch to TEMP and connect the temperature probe to the instrument.
2. Place the temperature probe in the medium be measured. The measured temperature is displayed.
3. Any PT-100 RTD temperature probes with Banana connectors can be used for specific temperature measurement applications.

ANALOG VOLTAGE OUTPUT

The analog voltage output can be used to interface with other instruments such as recorders,

printers, computer interfacing peripherals, etc.

Refer to page 3 for the analog voltage outputs for the models 5002, 5003 and 5005.

(REFER TO FIGURE 1, FIGURE 2, FIGURE 3)

The following rules must be observed in order to avoid reading inaccuracies or possible damage to the instrument.

1. If the sample solution is grounded, the equipment connected to the analog output must be “floating” from earth ground. The lead wire connected to the negative analog output, black terminal must not be touching earth ground through the interfacing equipment.
2. The input impedance of the interface device must be greater than 1 K Ohm.
3. Make sure that the AC line voltage is never accidentally connected to the analog output connectors.

pH BUFFERS

TEMPERATURE COEFFICIENT OF THE pH BUFFERS

	30		9.93
	35	10.32	9.89
0	40	10.25	9.86
5	45	10.18	9.83
10	50	10.12	9.80
15	55	10.06	9.78
20	60	10.01	7.00
25	10.01	9.97	

7.11	6.96		4.02
7.08	6.97	4.00	4.02
7.06	6.97	4.00	4.03
7.03	6.97	4.00	4.04
7.01	6.97	4.00	4.06
7.00	6.98	4.00	4.07
6.98	4.01	4.01	4.10

Table 1

WARRANTY

Jenco Instruments, Ltd. Warrants this product to be free from significant deviations in material and workmanship for a period of 1 year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the year period, please return—freight-prepaid and the correction of the defect will be made without charge. If you purchased the item from our Jenco distributors and it is under warranty, please contact them to notify us of the situation. Jenco Service Department alone will determine if the product problem is due to deviations or customer misuse.

Out-of—warranty products will be repaired on a charge basis.

RETURN OF ITEMS

Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, please have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Jenco will not be responsible for damage resulting from careless or insufficient packing. A fee will be charged on all unauthorized returns.

NOTE: Jenco Instruments, Inc reserves the right to make improvements in design, construction, and appearance of our products without notice.

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