

# Operation Manual

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## MODEL pH3900

2-Wire pH Transmitters

**JENCO** ELECTRONICS, LTD.

MANUFACTURER OF PRECISION INSTRUMENTS

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## **GENERAL INTRODUCTION**

Thank you for selecting the JENCO Model pH3900. The pH3900 is a 2-wire pH transmitter with input/output isolation, wide power supply range, high input impedance, LCD display, automatic temperature compensation, modular design and housed in a NEMA 4X enclosure.

The model pH3900 can be used with any pH electrode with INPUT and REF connector. The input signal is converted to a 4 to 20mA DC current output for indication, control, etc. The power supply range required to operate the transmitter is 11 to 50 VDC.

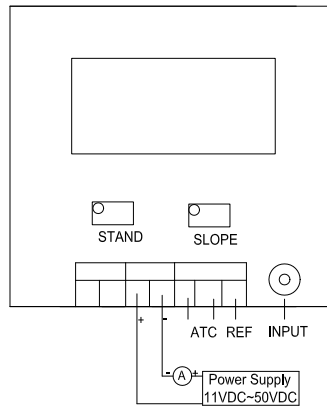
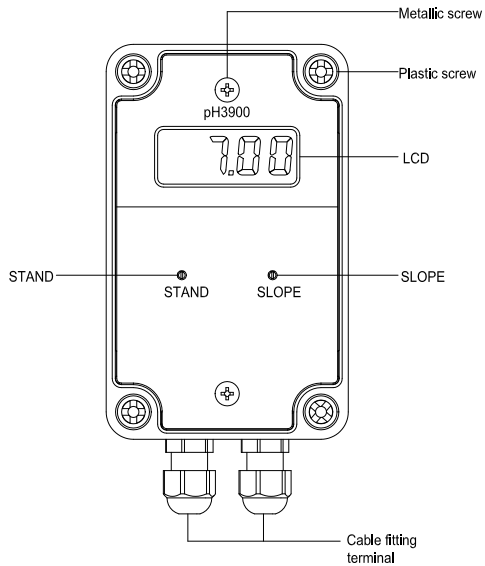
Input/output signal isolation eliminates ground loops and ground voltage differentials. In many applications, the signal ground can vary as much as a few hundred volts from the output ground.

## INITIAL INSPECTION

Carefully unpack the unit and accessories. Inspect for damages made in shipment. If any damage is found, notify your **Jenco** representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

## USING THE JENCO MODEL pH3900

1. Loosen the 4 plastic screws on the transparent cover of the pH3900. Remove the transparent cover.
2. Loosen the 2 metallic screws on the faceplate. Remove the faceplate. Save the white plastic supporting shaft of the bottom metallic screw for later use.
3. Thread the pH electrode connecting cable and the power supply cable through the cable fitting terminals. Ensure the polarity of the power supply cable is connected properly. See connection diagram.
4. Reattach the faceplate. Reattach the plastic supporting shaft to the bottom screw. Fasten the 2 metallic screws.



5. Rinse the pH electrode with distilled water. Immerse the electrode in the pH 7.00 buffer. After the reading is stabilized, adjust the STAND VR for the display to indicate the buffer value corresponding to the temperature of the buffer. Take the electrode from the pH 7.00 buffer and rinse the electrode with distilled water.
6. Immerse the electrode in the pH 4.00 buffer or pH 10.01 buffer. After the reading is stabilized, adjust the SLOPE VR for the display to indicate the buffer value corresponding to the temperature of the buffer. Take the electrode from the pH 4.00 buffer or pH 10.01 buffer and rinse the electrode with distilled water.
7. Repeat steps 5 and 6 until the two displayed pH readings (7.00 and 4.00 or 10.01) are identical to the buffers.
8. Reattach the transparent cover. Fasten the 4 plastic screws. Calibration is now complete and the pH3900 is ready to take measurements.

\*The following shows the temperature / buffer values:

Temp (°C)	0	10	20	25	30	40	50	60
Buffer 4.01	4.01	4.00	4.00	<b>4.01</b>	4.01	4.03	4.06	4.10
Buffer 7.00	7.11	7.06	7.01	<b>7.00</b>	6.98	6.97	6.97	6.98
Buffer 10.01	10.32	10.18	10.06	<b>10.01</b>	9.97	9.89	9.83	9.78
Buffer 4.00	4.01	4.00	4.00	<b>4.00</b>	4.01	4.03	4.06	4.09
Buffer 6.86	6.98	6.92	6.88	<b>6.86</b>	6.85	6.84	6.83	6.84
Buffer 9.18	9.46	9.33	9.23	<b>9.18</b>	9.14	9.07	9.02	8.97

**Notes:**

1. If the temperature of the solution to be tested is relatively constant, use a pH electrode without automatic temperature compensation. Connect the ATC connection terminals of the pH3900 with a temperature compensation (TC) resistor. **The ATC connection terminals must be connected with the temperature compensation resistor or else the pH3900 will not function.** The TC resistor to temperature data table is as follows:

<b>Temperature (°C)</b>	<b>Resistance (Ω)</b>
0.0	100.00
25.0	109.73
40.0	115.54
50.0	119.40
70.0	127.08
90.0	134.71
100.0	138.51

2. If the temperature of the solution to be tested is unstable, use a pH electrode with automatic temperature compensation with PT100 thermistor. Connect the ATC wires of the electrode to the ATC connection terminals of the pH3900.



## 4-20 mA OUTPUT AND POWER SUPPLY

1. The factory output of the transmitter is set to 4 mA (0.00pH) and 20 mA (14.00pH) and cannot be modified. The pH value can be obtained by measuring the transmitter output current (A) based on the following equation.

2.  $\text{pH} = [ (A-4) / 16 ] \times [ \text{pH at 20 mA} - \text{pH at 4 mA} ] + \text{pH at 4 mA}$

3. Example: A = 12 mA

pH value at 4 mA is 0.00, pH value at 20 mA is 14.00

$\text{pH} = [ (12-4) / 16 ] \times [ 14.00-0.00 ] + 0.00=7.00$

4. The minimum load (R) is determined by the following equation:

$$R = [ \text{Supply Voltage} - 11 ] / 20$$

The maximum load (R) includes the total loop resistance of the lead wires from the power supply.

## OUTPUT ISOLATION

The power supply ground is isolated from the pH electrode. If the pH electrode is in contact with the process ground, the voltage difference between the two grounds can

differ greatly causing measurement error and /or damage to the instrument. Input/Output isolation eliminates this problem.

## SPECIFICATIONS

Mode	Range	Resolution	Accuracy
pH	0.00 to 14.00 pH	0.01 pH	±0.02 pH

### **pH:**

pH buffers US (4.01, 7.00, 10.01) or NIST (4.00, 6.86, 9.18)

pH Temperature compensation Auto 0.0°C to 120.0 °C

Input impedance >10<sup>12</sup>

### **Temperature:**

Temperature sensor PT100

### **4-20mA output:**

Current output range 4 to 20mA (isolated)

Maximum load 550 ohm

**General:**

Power: 11VDC to 50VDC

Ambient Temperature range 0.0 to 50.0 °C

Case IP65

Weight 350 g

## **WARRANTY**

**Jenco** 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 free of 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, 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 authorized returns.

***【Note】*** : **Jenco** reserves the right to make improvements in design, construction and appearance of our products without notice.

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