OPERATION MANUAL

JENCO MODELS 3675 & 3676
1/4 DIN pH/ORP CONTROLLER

JENCO ELECTRONICS, LTD.
MANUFACTURER OF PRECISION INSTRUMENTS

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INITIAL INSPECTION

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

GENERAL INTRODUCTION

The models 3675 & 3676 are precise instruments for the measurement and control of pH and mV(ORP).

Two output relays are provided for ON/OFF control. The isolated 4-20 mA current output covers the input control range of 0 to 14 pH and 0 to 1400 mV.

Both models are housed in a rugged 1/4 DIN plastic case. This allows the meters to fit into standard panel cutouts, while providing industrial weatherproof and environmental housings.

THE METER

1.LCD(Model 3675) or LED ((model 3676) Disaply
2.HIGH ALARM SET POINT SWITCH
3.HIGH ALARM SET POINT LED
4.HIGH ALARM SET POINT CONTROL
5.PH STANDARDIATION TION CONTROL
6.PH SLOPE CONTROL
7.LOW ALARM SET POINT SWITCH
8.LOW ALARM SET POINT LED
9.LOW ALARM SET POINT CONTROL

1.PH/mV ELECTRODE BNC INPUT
2.ATC PROBE INPUT
3.ISOLATED 4-20 mA OUTPUT
4.REFERENCE ELECTRODE INPUT
5.EARTH GROUND
6.AC POWER INPUT
7.HIGH ALARM OUTPUT RELAY
8.LOW ALARM OUTPUT RELAY

1.PH/mV INPUT BNC CONNECTOR
2.MOUNTING BRACKET
3.PH/mV SELECT SWITCH

TEMPERATURE COMPENSATION

These meters are designed to be used with a PT-100 RTD temperature probe for Automatic Temperature Compensation operations. The alpha value of PT-100 element is 0.00385.

A precision 0.1% resistor can be connected across the ATC input terminals to simulate a fixed process temperature.

Temperature ℃	Resistor value Ω
0	100.00
10	103.90
20	107.79
25	109.73
30	111.67
40	115.54
50	119.40
60	123.24
70	127.07
80	130.89
90	134.78
100	138.50

Table 1

REAR PANEL CONNECTION
Refer to FIGURE 2.

1.Connect the AC line to the rear terminals of the instrument. The instrument can be powered by 115V AC or 230V AC, 50/60Hz. Make sure that the Earth terminal is connected to the earth lead of the AC power line.
2.Connect the proper load to the output relays. Be sure that the load does not exceed the relay rating, 5 Amp at 115V AC and 2.5 Amp at 230V AC for RESISTIVE load only.
3.Set the pH/mV switch to the position for pH or mV operations. Refer to FIGURE 3.
4.Load Connections: Connect the proper load to the 4-20 mA output terminals. Make sure that the load impedance is less then 550Ω and the common mode voltage does not exceed 500V DC.
5.Electrode Connections: If you are using a combination pH(mV) electrod, connect the electrode cable to the pH/mV electrode BNC input connector . If you are using separate pH(mV) electrode BNC input connector then connect the reference electrode to the Reference Input terminal.
6.Temperature Compensation Input Connections: Using the ATC mode, connect the ATC input terminals. A precision 0.1% resistor can be connected across the ATC terminals to simulate a fixed process temperature. Refer to TABLE 1.

MOUNTING PROCEDURE
1. Make a cutout on any panel, with a thickness of 1/16 in(1.5 mm) to 3/8 in.(9.5 mm). Refer to FIGURE 4
2. Remove the mounting brackets assembly from the panel meter and insert the panel meter into the cutout. Refer to FIGURE 5.
3. Replace the mounting brackets assembly onto the panel meter and fasten the mounting screws to secure the panel meter to the mounting

panel. Refer to FIGURE 6.

FIGURE 4.PANEL CUTOUT

FIGURE 5. PANEL METER WITH
MOUNTING BRACCKET AND SCREW

FIGURE 6. MOUNTING METHOD

PH CALIBRATION
Refer to REAR PANEL CONNECTION SCHEME and TEMPERATURE COMPENSATION.

1. Rinse the pH electrode and ATC probe with distilled water.
2. Measure the temperature of the buffer 7 solution with a precision thermometer.
3. Immerse the pH electrode and ATC/TEMP probe in buffer 7.Allow sufficient time for the pH electrode and ATC probe to reach temperature equilibrium with the buffer 7.
4. Adjust the STAND control for the instrument to display the buffer value corresponding to the temperature measured in step 2 . Refer to TABLE 2.
5. Remove the pH electrode and ATC probe from buffer 7 and rinse woth distilled water.
6. Measure the temperature of a second buffer with a precision thermometer.
7. Immerse the pH electrode and ATC probe in the second buffer. Allow sufficient time for the pH electrode and ATC probe to reach temperature equilibrium with the second buffer. For accurate pH measurements, the second buffer should be close in pH and temperature values to process under test. In practice, pH buffer 4 and 10 are commonly used.
8. Adjust the SLOPE control for the instrument to display the buffer value corresponding to the temperature measured in step 6. Refer to TABLLE 2.

9. Remove the pH electrode and ATC probe from the second buffer and rinse with distilled water. The instrument is dual point calibrated and is now ready for measurements.

TEMPERATURE COFFICIENT OF THE pH BUFFERS

BUFFERS

℃	10.01	7.00	4.01
0	10.32	7.11	4.00
5	10.25	7.08	4.003
10	10.18	7.06	4.00
15	10.12	7.03	4.00
20	10.06	7.01	4.00
25	10.01	7.00	4.01
30	9.97	6.98	4.02
35	9.93	6.98	4.02
40	9.89	6.97	4.03
45	9.86	6.97	4.04
50	9.83	6.97	4.06
55	9.80	6.97	4.07
60	9.78	6.98	4.10

TABLE 2

ISOLATION VOLTAGE

The differential voltage between the outputs and the load should not exceed the maximum values. Exceeding the maximum values may cause permanent damage to the instrument and load.

1. Relay Output:
   The maximum isolation voltage of the relay output contacts is 1500V DC, The voltage differential between the relay output contacts and the load should not exceed 1500V DC.
2. Current Output:
   The maximum isolation voltage of the 4-20 mA output is 500V DC.

The voltage differential between the 4-20 mA output and the load should not exceed 500V DC.

OUTPUT LOAD

1. Relay Output:
   The current through the relay output contacts should not exceed 5 Amp at 115V AC and 2.5 Amp at 230V AC in order not to cause permanent damage to the relay contacts. This rating is specified for RESISTIVE loads only.
2. Current Output
   The maximum load is 550Ω. Output current inaccuracies may occur for load impedance in excess of 550Ω.

CONTROLLER OUTPUT FEATURES

The output of the meter consists of two alarm relays and an isolated 4-20 mA output. The operation of the meter is described below. Refer to FIGURE 1 and FIGURE 2.

CONTROLLER INPUT RANGE

1. Relay Outputs:
   pH 0 to 14.00 pH
   mV ±1999mV
2. Current Output:
   pH 0 to 14.00 pH
   mV 0 to 1400 mV

ALARM RELAY AND LED FORMATS

1. HIGH ALARM set point:
   1.1 Press the HIGH ALARM set point switch. The instrument will indicate the alarm set point value. The alarm set point value can be

adjusted by the HIGH ALARM set point contral.

1.2 Release the HIGH ALARM set point switch. The instrument will indicate the measured processs value.

1.3 The High ALARM set point LED will be ON and the HIGH ALARM output relay will be energized when the measured value is greater then the alarm set point value. The HIGH ALARM set point LED will be OFF and the HIGH ALARM output relay will be de-energized when the measured value is less then the alarm set point value.

2. LOW ALARM set point:

2.1 Press the LOW ALARM set point switch .The instrument will indicate the alarm set point value. The alarm set point value can be adjusted by the LOW ALARM set point control.

2.2 Release the LOW ALARM set point switch. The instrument will indicate the measured process value.

2.3 The LOW ALARM set point LED will be ON and the LOW ALARM output relay will be energized when the measured value is less than the alarm set point value. The LOW ALARM set point LED will be OFF and the LOW ALARM output relay will be de-energized when the measured value is greater than the alarm set point value.

3. SET POINT HYSTERESIS:

The hysteresis for the meters is factory set to ±0.1pH(10 mV).For HIGH ALARM set points, the trigger ON point is 0.1pH(10 mV) above the set point values and trigger OFF point is 0.1pH(10 mV) below the set point values. For LOW ALARM set points, the tigger ON point is 0.1 pH(10 mV) below the set point values and the tigger OFF point is 0.1 pH(10 mV) above the set point values.

ISOLATED 4-20 mA output

1. pH MODE OUTPUT:

The 4-20 mA Output is 4mA at 0 pH and 20 mA at 14 pH. The pH value can be obtained by measuring the output current,A,based on the following equation. Refer to FIGURE 7.

pH = (A-4)x(14/16)

Example:A=12 mA for pH =7.00

2. mV MODE OUTPUT:

The 4-20 mA output is 4 mA at 0 mV and 20 mA at 1400 mV. The mV value can be obtained by measuring the output ccurrent, A, based on the following equation. Refer to FIGURE 7.

mV = (A-4)x(1400/16)

Example: A=12 mA for mV=700

pH MODE mV MODE

FIGURE 7

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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