

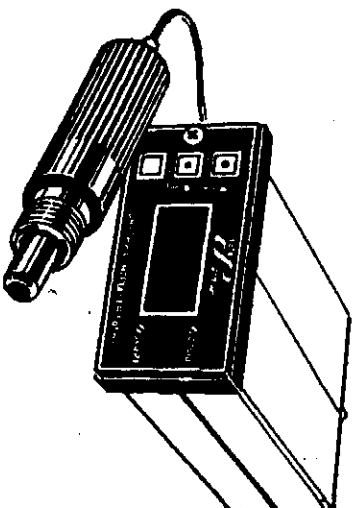
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**COLE-PARMER**  
INSTRUMENT & EQUIP. CO.

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*New Manual*

**Operating Instructions**

**Cole-Parmer Model 05656-00** ✓  
**LED pH/ORP Controller**



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**Cole-Parmer Instrument Company**  
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**NOTE:**

Please take care to use this instrument properly, according to the instructions given in this manual.

Proper caution should always be employed when working with any instrument.

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**General Description**

Model 05656-00 is a 1/2 DIN controller for pH or ORP measurement. It features automatic temperature compensation (with use of ATC probe), high and low overrange panel lights plus output relays for high and low pH control and alarms, recorder output and readout for temperature and ORP. Internal switching selects pH or ORP.

**Note:** You must have a pH electrode with ATC to calibrate this unit or a fixed value resistor 110  $\Omega$  for 77°F (25°C).

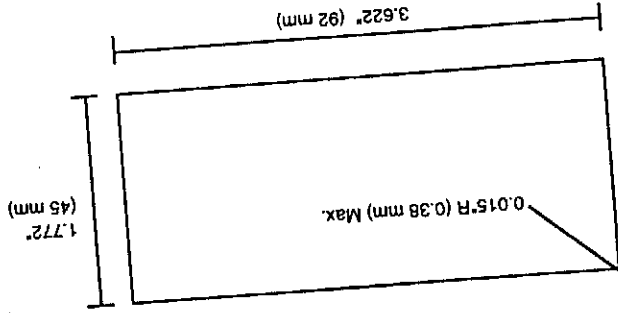


Figure 1-Panel Cutout Dimensions

Range:	0 to 14 pH
Resolution:	0.1 pH $\pm 1$ digit (relative)
Accuracy:	when standardized
Recorder output:	1400 mV
Range:	+1990 to -1990 mV
Resolution:	10 mV
Accuracy:	$\pm 1990$ mV
Recorder output:	0° to 100°C
Range:	1°C
Resolution:	1°C
Accuracy:	1000 mV at 100°C
Recorder output:	Greater than 10 <sup>13</sup> ohms
Input impedance:	8 amps (117 VAC) or 4 amps (230 VAC)
Relay capacity:	115 or 230 VAC $\pm 15\%$ , 50/60 HZ
Power:	3.9" x 2" x 7" (9.75 x 5 x 17.5cm)
Dimensions:	Approx. 1.8 lbs (0.81 kg)
Weight:	

Specifications

1. Make a cutout in any panel for the meter, approximately 3.62" x 1.77". (See Figure 1, previous page, for more accurate dimensions. The panel should range from 1/8" to 3/8" inches (1.5 to 9.5mm) in thickness.
2. Remove the mounting screw and mounting bracket from the panel. Slide the mounting bracket back on to the meter from behind the panel. Fasten the screw to secure the panel meter to the mounting panel.

Mounting Procedure

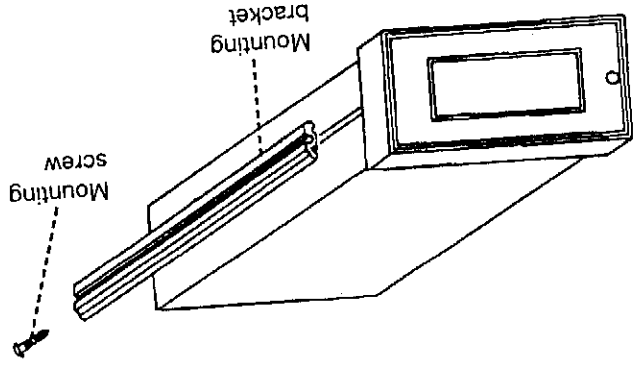


Figure 2-Mounting

## Installation

1. Connect the AC line, high set relay output and low set relay

output according to the wiring diagram (Figure 4).

**NOTE:** Use the NO (normally open) and COM (common) terminals of the relay for control operations. Most

system failures would de-energize the relays, thus

2. Loosen the front panel screw and pull the front panel and circuit

board from the housing. Set the internal pH/ORP select switch

to the desired mode of operation. (Refer to Figure 5.) Push the

front panel back into its housing and replace the screw.

3. For pH mode: Connect a pH combination electrode with BNC

connector to the input and a PT100 ATC/TEMP probe with

miniature phone jack to the ATC/TEMP input or use a 10 ohm

resistor for fixed temperature compensation at 79.3 or 26.3°C.

**NOTE:** You must have an ATC probe for pH measurement and

calibration.

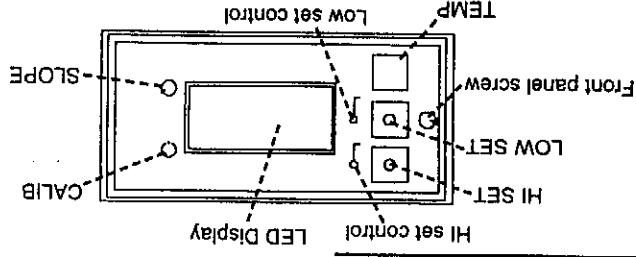
4. For ORP mode: Connect an ORP combination electrode with

BNC connector to the input. Connect a PT100 temperature

probe to the ATC TEMP input only if temperature measurement

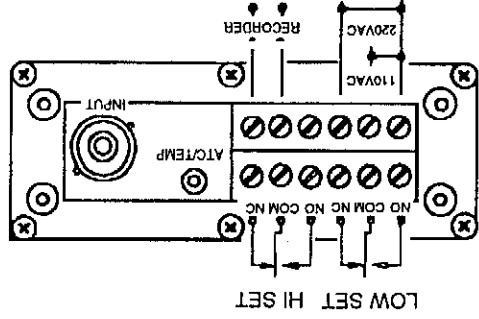
is required.

**Figure 3-Front Panel**

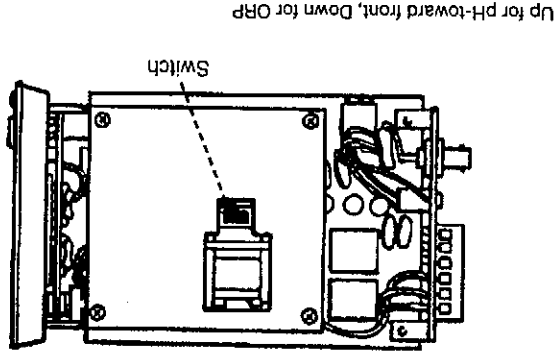


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**Figure 4-Rear Panel/Wiring**



**Figure 5-pH/ORP Switch**



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## pH and ORP Measurements

### For pH standardization:

1. Immerse the pH electrode and ATC/TEMP probe in buffer 7.00.
2. Press the TEMP switch on the front panel. Wait for the temperature reading to stabilize on the display. The meter will then indicate the temperature of the buffer.
3. Release the TEMP switch. Refer to Table 1, page 8, to find the buffer value corresponding to the temperature value in Step 2.
- Adjust the CALIB control on the front panel to display this buffer value.
4. Rinse the electrode and probe with distilled or deionized water; then immerse both in either buffer 4.01 or buffer 10.00.
5. Repeat Step 2 for the second buffer.
6. Release the TEMP switch. Refer to Table 1, page 8, to find the buffer value corresponding to the temperature value in Step 5.
7. Adjust the SLOPE control to read this buffer value.
8. The meter is standardized and ready for measurements.

### For ORP measurements:

In the ORP mode the meter indicates the absolute value of the measured mV. No calibration is necessary.

## Controller Set Points

**High set:** Press the HI SET switch on the front panel to display the value of the high set point. Adjust the HI SET control to reset the pH or mV high set point. Release the HI SET switch and the meter again indicates the process pH or mV values.

**Low set:** Press the LOW SET switch to display the value of the low set point. Adjust the LOW SET control to reset the pH or mV low set point. Release the LOW SET switch to display the process pH or mV values.

Each of the set points, high and low, has a built-in hysteresis, or dead band, of +1 digit (i.e., +0.1 pH in the pH mode and +10 mV in the ORP mode). Due to this hysteresis, the high and low set points will be at least 0.2 pH or 20 mV apart.

## Relay and Front Panel LED Format

1. The HI SET relay and the HI SET indicator on the front panel are energized when the process value is greater than the set value. The LOW SET relay and the LOW SET LED indicator on the front panel are energized when the process value is less than the set value.
2. Use the NO (normally open) and COM (common) terminals of the relay for control operations. Most system failures would de-energize the relays thus disrupting power to the external control devices.

## Temperature Measurement

1. Press the TEMP switch on the front panel, and the meter will display the process temperature. The process (pH or mV) value will again be displayed when the TEMP switch is released.
2. While the TEMP switch is depressed, the relays will be de-energized and any external control devices will be de-activated. Therefore, use the temperature mode only for pH standardization or for process measurements before the control loop is established.

**Table 1-Temperature/pH value chart**

Temperature		Buffer Values (pH)		
°C	(°F)	4.01	7.00	10.00
0	32	4.0	7.1	10.3
5	41	4.0	7.1	10.3
10	50	4.0	7.1	10.2
15	59	4.0	7.0	10.1
20	68	4.0	7.0	10.1
25	77	4.0	7.0	10.0
30	86	4.0	7.0	10.0
35	95	4.0	7.0	9.9
40	104	4.0	7.0	9.9
45	113	4.0	7.0	9.9
50	122	4.1	7.0	9.8
55	131	4.1	7.0	9.8
60	140	4.1	7.0	9.8

Buffers other than 4.01 or 10.01 may be used for standardization. Make sure to check the buffer temperature value.

## Accessories

Optional pH electrodes and ATC probes are available for use with this unit. The following is a partial list. Call Cole-Parmer toll-free at 1-800-323-4340, for ordering information or for further details on our complete line of pH electrodes.

Model no.	Description
MN-05993-70	General purpose pH electrode. With built-in platinum RTD temperature sensor; in-line; disposable.
MN-05993-81	General purpose pH electrode. With built-in platinum RTD temperature sensor; submersible; disposable.
MN-05994-42	Industrial in-line ATC probe. For use with pH electrodes with no built-in temperature sensor.
MN-05994-44	Industrial submersion/tank ATC probe. 100 ohm Pt element at the end of a 3-ft ABS tube; 10-ft cable.

Kynar-Reg TM Fenwall Corp.

## Warranty

The Cole-Parmer Instrument Company warrants this product to be free from significant deviations in material and workmanship for a period of 6 months from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the 6 month period, please return—freight prepaid—and correction will be made without charge. Cole-Parmer 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 our Customer Satisfaction Department before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned.

For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Cole-Parmer will not be responsible for damage resulting from careless or insufficient packing.

A restocking charge will be made on all unauthorized returns. NOTE: The Cole-Parmer Instrument Company reserves the right to make improvements in design, construction and appearance of our products without notice.



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