

# DATA Sheet

## pH/ORP & CO<sub>2</sub> Analyzer/Controllers



**Model 5000 Continuous pH/ORP  
Monitor/Controller**



**Model 5300 Continuous pH/CO<sub>2</sub>  
Monitor/Controller**

### Features

- User friendly setup
- Panel mountable
- Digital readout
- Microprocessor based electronics
- Self-diagnostic electronics
- NEMA 4 (IP65) Enclosure

Royce pH/ORP and pH/CO<sub>2</sub> Analyzers are designed to encompass the needs for these important measurements within all industries. The monitoring and control of pH/CO<sub>2</sub> or Oxidation Reduction Potential (ORP) in all aspects of the chemical process, water-wastewater treatment, pulp/paper, and aquaculture industries can be fulfilled with the use of a Royce system. The instrument systems are rounded out by a flexible line of combination pH/ORP electrode in the industry.

Both instruments in the line include tactile feedback membrane keypads, automatic temperature compensation, pH/ORP, pH/CO<sub>2</sub> and temperature readout, user-friendly processor programming, NEMA 4X (IP65) enclosures, nonvolatile processor memory and self-diagnostic electronics.

The Model 5000 measures 0 to 14 pH or +/- 1999 mV ORP. The Model 5300 measures 0 to 14 pH or 0 to 999 mg/l CO<sub>2</sub>.

Royce offers a complete line of rugged, industrial grade pH/ORP sensors available in combination configurations to suit any application. These electrodes have the unique feature of a reference gel electrolyte, called Hydrogel, which continually seeps toward the liquid sample, keeping the reference junction(s) clean. The **Model 51A** submersible electrode is a sealed combination electrode mounted in a 3/4 inch Dia. x 6 inch long Schedule 80 ABS pipe. The **Model 52A** is a twist lock Kynar electrode with locking features to insure the electrode stays secure in the flowcell. The flowcell is available in a 1" or 3/4" Dia. Kynar threaded Tee with a Kynar electrode adaptor. The **Model 53A** is a pipe insertion electrode designed specifically for the rugged applications of pipelines and vessels that are under pressure in a flowing state. The **Model 55A** pH electrode is a flat bulb design set into a schedule 80 ABS body, which is specifically machined to accept the Royce Jet Head electrode cleaner.

When combined with the Royce pH/ORP or pH/CO<sub>2</sub> analyzers, Royce guarantees the highest quality precision measurement and the longest electrode life available in an industrial electrode today.

## Model 5000 Continuous Monitor/Controller



The Model 5000 pH/ORP monitor/controller measures 0-14pH or +/- 1999mV ORP. The NEMA 4 (IP65) rated enclosure is wall, rail or panel mountable.

All programmable functions are user accessed via a membrane keypad. User parameters are stored in non-volatile memory to ensure they are retained during a power interruption. A security code parameter is available to protect accidental or unauthorized changes to the system programming.

Standard features include single and dual point calibration, pH voltmeter function, temperature input calibration, serial communications output and isolated outputs. Setpoint relays and PID control are available options.

### 5000 Specifications

#### Measurement Ranges:

pH: 0 to 14 pH  
ORP: -1999 to +1999 mV DC.

#### Displayed resolution:

pH: 0.01  
ORP: 1 mV  
Temperature: 1° (C or F)

#### Control Options:

Optional Setpoint Relay Function  
Optional fully programmable PID controller for Analog Output Control

## Model 5300 Continuous pH/CO<sub>2</sub> Controller



The Model 5300 pH/CO<sub>2</sub> controller measures 0-14pH or 0-999 mg/l CO<sub>2</sub>. The 5300 includes all the standard features of the Model 5000 pH/ORP monitor. It also includes 2 relays (rated 250VAC at 5 amps resistive load) as standard.

Dissolved Carbon Dioxide can have a dramatic effect in chemical and biological processes, especially where pure oxygen is used instead of mechanical aeration. The 5300's microprocessor calculates dissolved CO<sub>2</sub> in real time. Compensating for temperature, known alkalinity and conductivity of the water being tested; the 5300 displays the value of free CO<sub>2</sub> based on the current pH measurement. Switching between pH and CO<sub>2</sub> is a single keypad operation.

### 5300 Specifications

#### Measurement Ranges:

pH: 0 to 14 pH  
CO<sub>2</sub>: 0.0 - 999 mg/l

#### Displayed Resolution:

pH: 0.01  
CO<sub>2</sub>: 0.1 mg/l  
Temperature: 1° (C or F)

#### Relays:

(2) rated 250 VAC at 5 AMPS resistive load

### General Specifications

#### Temperature Measurement Range:

-17 to 150°C (0 to 301°F)

#### Accuracy (includes linearity; sensor not included):

Measurement: +/- .2% of full scale.  
Temperature: +/- 1%

#### Repeatability:

+/- .2% of full scale.

#### Supply Voltage Effects:

For +/- 10% Voltage Shift +/- 1.0%  
50Hz +/- 3Hz +/- 0.1%  
60Hz +/- 3Hz +/- 0.1%

#### Outputs:

Isolated 0 to 1 v output 5k ohms minimum load or isolated  
4 to 20 mA DC output 900 ohms maximum load.  
Standard RS-485 Serial Digital Port.  
Optional Relays (2) rated 250 VAC at 5 AMPS resistive load.

#### Supply Voltage (as specified):

115 VAC, 50/60 Hz, 3 Watts  
230 VAC, 50/60 Hz, 3 Watts

#### Temperature Compensation Accuracy:

+/- 1% based on reference temperature compensator and reference compensation

#### Enclosure Rating:

Nema 4X

#### Weight:

3 lb (.6kg)

#### Environmental:

-10 to 60°C Ambient Operating Range  
0 to 95% Relative Humidity, Non-Condensing  
40 to 85°C Ambient Storage Range

## pH/ORP Electrodes and Electrode Systems

All Royce pH/ORP electrodes incorporate a special Hydrogel reference solution that seeps toward the liquid sample keeping the reference junction clean. These electrodes are available in a wide variety of combinations and mounting options to fit any application.

### Features

- Self-Cleaning Reference Junction
- ABS Body
- Integral Preamplifier Body
- Temperature Compensation Available
- Double Reference Junction Available
- Hard Glass Bulb Available
- Jet Head Assembly for Air or Water jet-Cleaning Available (Model 55 only)

### Specifications

Maximum Process Pressure:

100 PSI

Operating Temperature:

ABS = 0 - 90°C



**Model 51A  
Submersible Electrode**



**Model 52A Flow Cell  
Mounted Electrode**



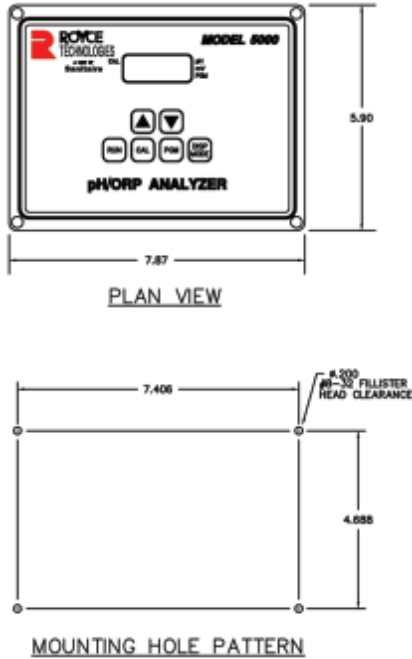
**Model 55A  
Flat Bulb Electrode  
With Jet Clean Head**

All electrodes are available in pH or ORP configurations. When ordering ORP electrodes, either the standard glass bulb or flat bulb is available. Temperature compensation and preamplification are not required for this measurement.

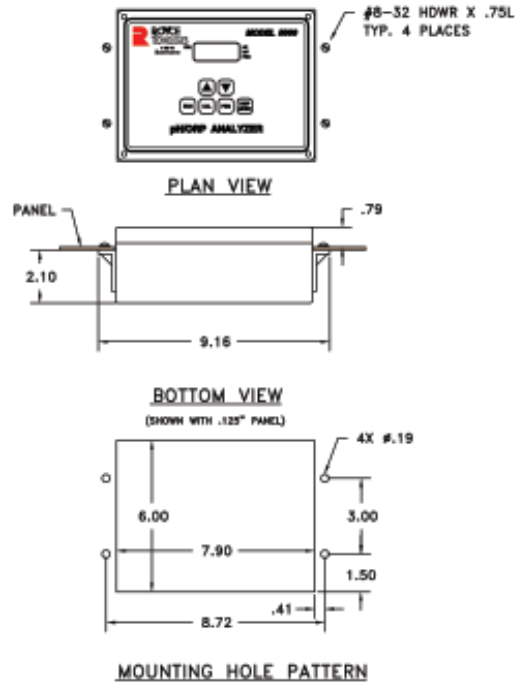
The Model 55A sensor is designed for automatic jet-cleaning of the reference bulb by air or water. This function is controlled by the Model 5000 or 5300 analyzer. House air or water can be used or the Royce Compressor Assembly

# Model 5000/5300 Mounting Information

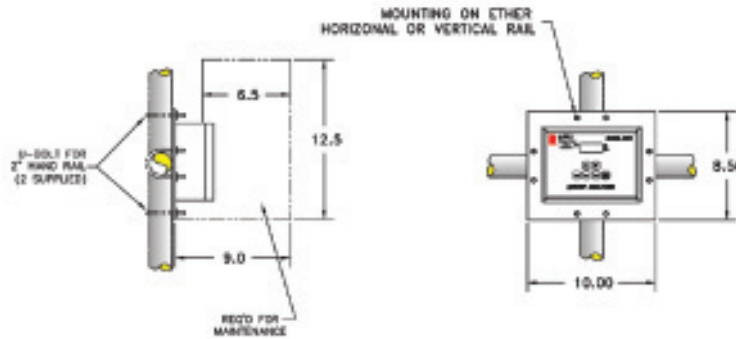
## Wall Mount



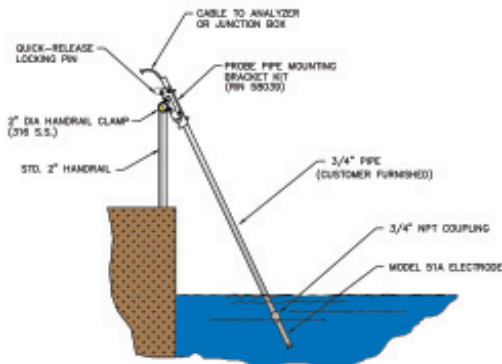
## Panel Mount



## Rear Rail Mount



## Electrode Mounting



## Accessories and Spare Parts

Part Number	Description
54149	pH 4 Buffer
54150	pH 7 Buffer
54151	pH 10 Buffer
58038	Deluxe Handrail Bracket for 1-1/4" Pipe Mount
58039	Deluxe Handrail Bracket for 3/4" Pipe Mount



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