

Advanced Monitoring and Control of Dissolved Oxygen for Process Optimization

The 7020 Series Dissolved Oxygen System

Measure Dissolved Oxygen More Effectively than Ever Before

The 7020 Series dissolved oxygen system leads the industry with the most advanced package available. Honeywell's dissolved oxygen system is unique in both operation and configuration, providing the most comprehensive dissolved oxygen measurement in the marketplace. The system is comprised of a patented equilibrium probe technology—unaffected by inert fouling or changes in process flow conditions—and a full-function analyzer/controller with weather-proof case, suitable for outdoor use.

Your Process Deserves Better than Conventional Diffusion-type Probes

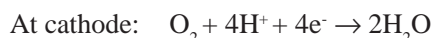
Conventional diffusion-type probes work on the galvanic or polarographic principle. Measurement of oxygen with these probes requires constant and continuous oxygen transfer across the membrane in a single direction. For this reason, the probe's measurement is highly dependent on flow to replenish consumed oxygen. In addition, the corrosive by-product of the electrochemical reactions makes periodic electrode cleaning, replacing, or recharging necessary to ensure reliable measurement. Each time the probe is serviced, the electrolyte must be changed and the membrane must be either re-applied, if possible, or replaced.

Highest Accuracy and Lowest Maintenance

The innovative design of the Honeywell equilibrium probe is based on maintaining an equal partial pressure of oxygen inside and outside the probe. When the probe is immersed in a sample, oxygen penetrates the membrane and is reduced at the cathode. The current necessary to reduce this oxygen is converted by the analyzer to give the concentration of dissolved oxygen in the solution. Simultaneously, an equal amount of oxygen is generated by the anode. This reaction continues until the partial pressure of oxygen on both sides of the membrane is re-established, i.e. come to equilibrium.



The electrochemical reactions of the patented equilibrium probe are as follows:



The result—a net reaction of zero. When nothing is consumed, nothing needs to be replaced. The ingenious equilibrium design enables a consistently accurate and reliable measurement completely independent of process flow—and requiring no internal probe maintenance.

Probe features:

- Equilibrium probe technology
- Rugged PVC or 316 stainless-steel construction
- Immersion, insertion, or flow-through mountings
- Process temperature measurement.

Unprecedented Performance in a Dissolved Oxygen Analyzer

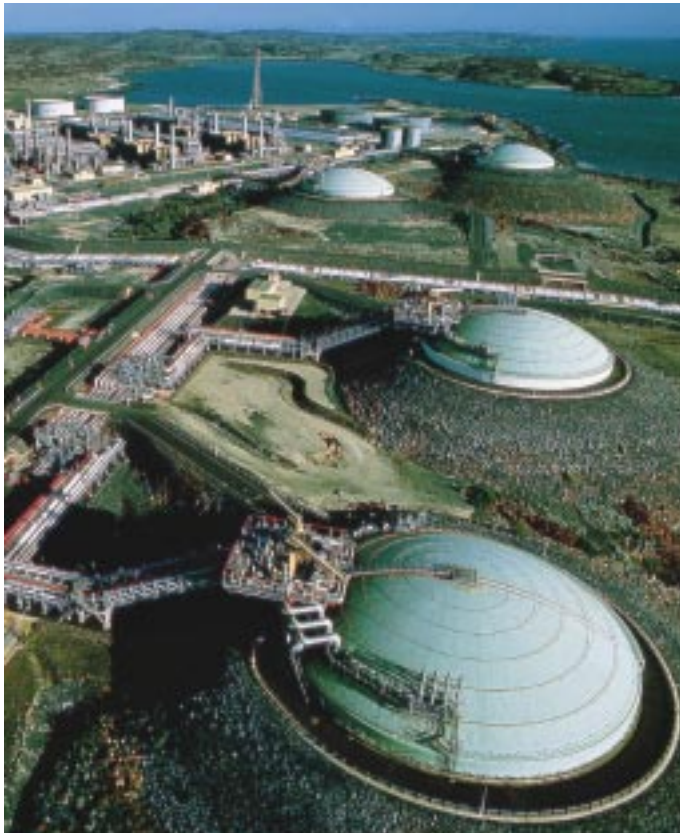
The microprocessor-based analyzer is the only dissolved oxygen analyzer available with control functions as well as advanced diagnostics. The analyzer provides dissolved oxygen measurement in two ranges—parts per million (ppm) and parts per billion (ppb)—to ensure optimum accuracy in your application.

Analyzer Features:

- Built-in PID controller with current (CAT) or time-proportioning (DAT) output
- Multiple-current output option for simultaneous dissolved oxygen, control, and temperature outputs
- Process flow input for feedforward control
- Up to five relays for alarm, control, automatic maintenance, and/or range identification
- Retention of alarm and diagnostic history for quick retrieval
- Air and sample calibration available
- Specialized preventive-maintenance probe diagnostics
- Auto-ranging of display and outputs
- Unattended automatic probe cleaning and/or calibration
- ISO 9002-certified QC management
- CE approved for EMC and safety.

Applications

PPM-range analyzers measure the concentration of dissolved oxygen in municipal or industrial wastewater lagoons and open water. Controlling the amount of dissolved oxygen is important to the health of the microorganisms in the water. Too little dissolved oxygen will jeopardize the health of the microorganisms and could result in “losing the basin”. Recovery from a lost basin is both expensive and

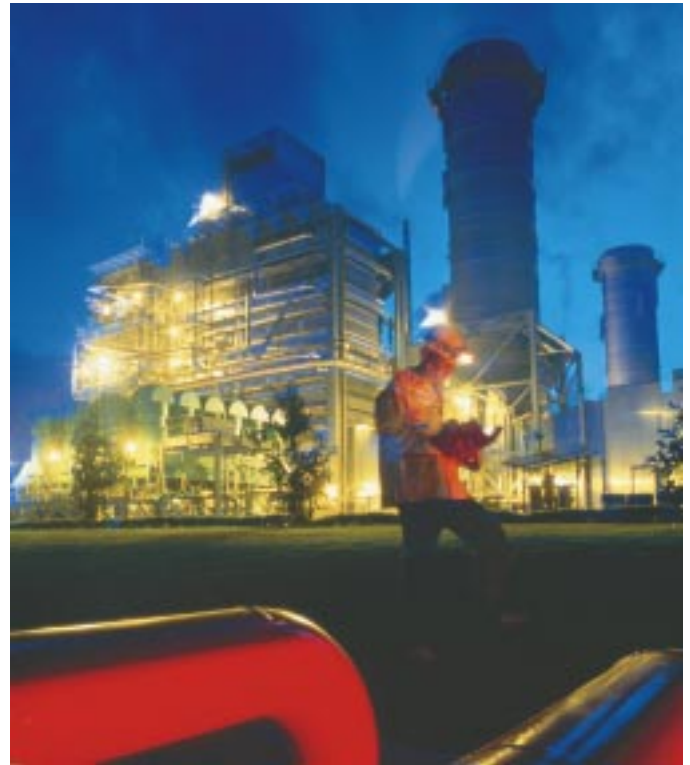


time-consuming. On the other hand, when more oxygen is produced than the microorganisms can use, the excess does not upset the process but represents a significant unnecessary waste of energy dollars required to run the compressors or aerators.

Reduce your energy cost while maintaining process quality. The 7022 analyzer allows you to continuously monitor oxygen concentrations in your process to determine when the amount of dissolved oxygen drops below your optimal level. Then—and only then—you run the blowers. Controlling blower usage allows you to save valuable energy dollars and protect your process.

To reduce costly maintenance in heavily fouling applications, the analyzer enables unattended automatic cleaning and/or calibration, controlled through timing, logic, and relay contacts. The clean/calibration sequence can also be activated from the front panel or by external contact closure. In addition, a secondary input enables immediate corrective action for variations in process flow.

Typical ppm applications include Aeration Monitoring and Control, Effluent Monitoring, Stream Monitoring, and Aquaculture Monitoring and Control.



PPB-range analyzers measure the concentration of dissolved oxygen in boiler feed water and other flow concentration samples to protect valuable equipment from devastating, costly corrosion effects. Whether your process uses mechanical deaerators, chemical oxygen “scavengers,” or oxygenated treatment (OT), to control oxygen concentrations at the ppb levels, Honeywell equipment is specifically designed to protect your process.

The 7021 Analyzer can accurately and efficiently monitor across all concentration ranges without modification of probe or analyzer. Auto-ranging of both display and current output enables monitoring at low ppb levels as well as at the high levels encountered during start-up. Four output scaling ranges can be programmed (e.g., 0-20, 0-200, 0-2,000, 0-20,000 ppb) with dry relay contact closures to identify the active range to a data-acquisition system. The relay logic can also direct the output signal to different points of a multipoint record as three means of range identification.

Typical ppb applications include conventional water chemistry in power utilities, oxygenated treatment in power utilities, and water treatment in the semiconductor industry.



Analyzer Condensed Specifications

Measurement Ranges	Parts per million (ppm) or parts per billion (ppb)
Display	Back-lit dot matrix LCD display
Front-panel Pushbuttons	Eight sealed elastomeric keys
Analog Inputs	Dissolved oxygen, process temperature, feedforward flow, salinity, or remote setpoint
Analog Outputs, up to three	Dissolved oxygen, temperature, and/or control
Discrete Inputs	Up to two available
Discrete Outputs	Up to five available
Compliance	NEMA 4X, IP55, and CE approved QC Management: ISO 9002

Probe Condensed Specifications

Response Time	90% in 60 seconds
Oxygen Consumption	Negligible
Temperature Range	32-140°F (0-40°C) normal, must not freeze; 32-140°F (0-60°C) extreme, with reduced accuracy
Maximum Flow	950 mL/min. with flow chamber; no dependence on stirring or flow rate
Maximum Pressure	PVC: 30 psig (207 kPa) SS: 50 psig (345 kPa)
Dimensions	8.62 in. x 1.315 in. OD (219 x 34 mm OD), 1-in. NPT pipe size, 20-ft. (6.1-m) waterproof cable
Weight	PVC: 1.25 lb. (0.6 kg) SS: 3.5 lb. (1.6 kg)

Combined Probe/Analyzer Condensed Specification

Accuracy	ppm measurements: ± 0.2 ppm (at calibration conditions, after stabilization) ppb measurements: $\pm 5\%$ of reading or 2 ppb, whichever is greater (at calibration conditions, after stabilization)
Interference	Dissolved hydrogen (present in some BWR nuclear power plant samples) can cause significant negative interference in measurement. Honeywell dissolved oxygen equipment is not recommended for these applications.

With more than 100 years of experience and thousands of installations worldwide, Honeywell is uniquely qualified to be your strategic liquid analytical partner.

For more information on the 7020 Series dissolved oxygen system, as well as other Honeywell analytical instrumentation, contact your local Honeywell representative. **Or in the U.S. call 1-800-288-7491. Or visit our World Wide Web site at <http://www.iac.honeywell.com>.**



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