

Minimizing the Total Life-Cycle Cost of an Oxygen Analyzer Installation

BACKGROUND

The initial purchase cost of an analytical instrument is usually only a fraction of the total cost of installing, starting, operating and maintaining the device. All costs of ownership must be examined when considering an instrument.

The Emerson facility in Ohio pioneered this concept with the in situ oxygen probe, introduced in the early 1970s. The in situ design eliminates the maintenance-intensive sampling systems previously used.

Emerson also designed the first totally field-repairable probe, the World Class 3000, eliminating the need for factory rebuilds.

OXYMITTER™

Emerson's Rosemount Analytical Oxymitter In Situ Flue Gas Oxygen Transmitter has integrated the "signal conditioning electronics" into the oxygen probe. As the chart on the reverse side of this page indicates, this architecture saves significant installation and maintenance costs.

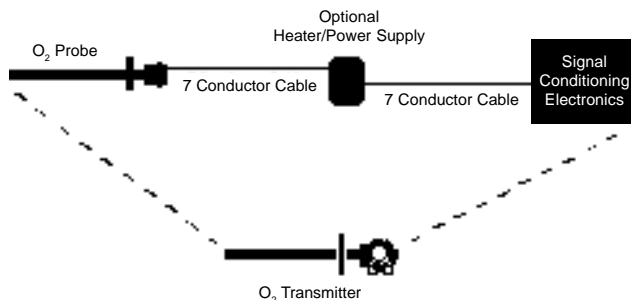


Figure 1.

Analyzer to Transmitter-Reducing Complexity



Figure 2.

Oxymitter In Situ Flue Gas Oxygen Transmitter

ADDITIONAL BENEFITS FOR OXYGEN PROBE SYSTEMS

By integrating the probe and electronics into a single unit, the interconnecting cable is eliminated, along with the conduit/cable tray and many screw terminations.

The Oxymitter power supply accepts AC power voltages from 85-240V, 50/60 Hz, without setup or configuration - just connect the wires!!

Most oxygen probes are calibrated on a frequency based upon operating experience or upon demand by operations personnel. The Oxymitter conducts an on-line gasless self-check once a day and provides an indication when a gas calibration is recommended. Operators and technicians can operate with the confidence that the unit is accurate in between calibrations. Automatic or semi-automatic calibration may be selected and the digital electronics is self-adjusting.

The Oxymitter is completely rebuildable, eliminating the need to send the probe back to the factory for service. Diffusion element, sensing cell, heater and thermocouple are all replaceable.

The electronics plug into the cast housing and all wires from the cell, heater and T/C are plug-connectable into the electronics, eliminating 14 screw terminations.

Life Cycle Cost Comparisons

	Conventional O ₂ Systems	Oxymitter	Savings/Unit ¹
Installation Comparison			
Mounting	Probe Electronics 7 conductor cable/conduit	Probe/Electronics - -	- 2 hr. installation \$150-\$900 cost of cable
Wiring	terminate cable at probe (7 terminals) terminate cable at electronics (7 terminals) Mains Power 4-20 mA signal	- - Mains Power 4-20 mA signal	2 to 8 hr. installation 1 hr. 1 hr. -
Setup	Power Selection via 4 to 8 jumpers/switches	-	1 hr.
Total Installation Time Saved Per Probe: ¹			7 to 13 hrs.
\$ Saved (at \$45 per hr.*) Per Probe:			\$465 to \$1,485

	Conventional O ₂ Systems	Oxymitter	Savings/Unit ¹
Operational Comparison			
Calibration	Automatic or Semiauto Cal frequency by technician or Locally, at electronics	Automatic or semiauto Based upon "Cal Remotely from the control room via HART®	75% fewer calibrations 2 hr. per diagnosis
Troubleshooting			4 diagnosis/yr.
Repair	Replace or rebuild at factory 7 screw terminals in probe junction box Cards connected via cable ribbon	Full rebuildability Two plugs from probe to electronics Cards plug directly into housing	\$2,000 per failure 1/2 hrs. per rebuild (one per year)
Annual Time Savings Per Probe: ¹			15 to 30 hrs.
Annual \$ Savings (at \$45/hr*) Per Probe:			\$750 to \$3,500/yr.

* includes all wages and benefits

¹ Figures shown are intended for guidance only. Actual figures may vary.

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Emerson Process Management

Rosemount Analytical Inc.

Process Analytic Division

6565 P Davis Industrial Parkway

Solon, OH 44139 USA

T 440.914.1261

Toll Free in US and Canada 800.433.6076

F 440.914.1271

e-mail: gas.csc@EmersonProcess.com

www.raihome.com



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