SYSTECH illinois

Optional Remote Cell

Intrinsically Safe Oxygen Analyzer

EC91

Intrinsically Safe ATEX, unsurpassed certified oxygen analyzer for all hazardous areas

INDUSTRIAL PHYSICS

Protecting Product Integrity

Intrinsically Safe Oxygen Analysis

Systech Illinois have over 30 years of expertise in manufacturing gas analyzers for the process industry and have an installed base of over a thousand instruments during this time.

The EC91 Process Oxygen Transmitter will detect levels of oxygen as low as 1ppm, up to higher percent levels and can be used on most industrial gases and atmospheres. There is no need for routine maintenance of the fuel cell and the instrument can be easily calibrated, using ambient air or standard calibration samples.

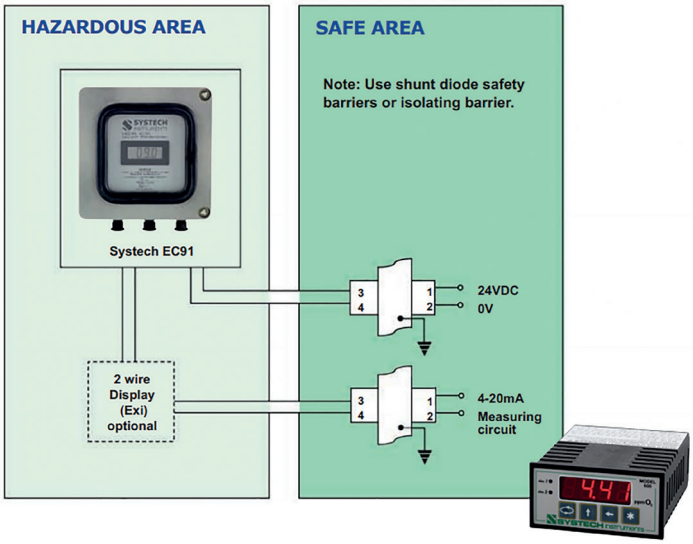
The enclosure is manufactured from moulded glass fibre reinforced polyester, a material with high impact resistance. It will not be harmed by oils, common acids and alkalis, making it suitable for harsh environments. It is protected to IP66/Nema 4X. The EC91 transmits a 4-20mA signal which corresponds to the range of the analyzer. Up to six ranges can be specified.

A safe area digital indicator and alarm is available as an option.

Standard and custom designed sample systems are available on request. Sample gas may be piped directly to the instrument or remote cell assembly (also certified intrinsically safe). Sample pumps and aspirators are also available.

All the electronic circuits are intrinsically safe and have been certified to ATEX. The EC91 is approved for Ex ia IIC T4 Ga.

Installation



The sample pressure should be above 0.1 Bar. If not, a pump or aspirator should be fitted. Connection through the analyzer is via a 1/8" tube fitting and a flow regulator should be used on the inlet. If required, dust filters or coalescing filters are available.

Standard or specially designed sample systems can also be supplied by Illinois.

Electrical installation must be made via appropriate safety barriers mounted in the safe area. A control room indicator and alarms can also be specified as an option.

Contact Details

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Principle of Operation

The self-powered sensor has no moving parts and is integral to the sample chamber.

This solves the problem of output changes due to a flow rate change, making the instrument extremely sensitive and quick to respond to changes in oxygen concentration.

Optional EC91 Remote Mounted Sensor

(All Stainless Steel)

The sensor consists of an anode, electrolyte, and air cathode, together with a diffusion limiting capillary. The rate of diffusion is dependent upon the volume concentration of oxygen in the atmosphere or gas stream. At the cathode, oxygen is reduced to hydroxyl ions, which in turn oxidises the metal anode. The following overall reaction takes place:

$$2Pb + O_2 + 2H_2O \rightarrow 2Pb(OH)_2$$

The sensor has a guaranteed operational life of six months. When monitoring low oxygen concentrations, or if the instrument is not in use, the expected lifetime is considerably longer. The sensor module is inexpensive and easy to replace.

Safety Protection

Gas analysis instrumentation for use in hazardous areas is commonly flame proof, explosion proof or intrinsically safe.

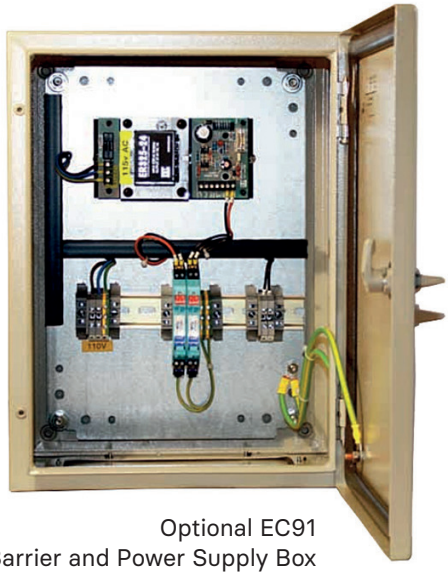
Flame proof or explosion proof instrumentation is designed to contain any event, in order to protect the close environment. This instrumentation is expensive and work permits are required in order to maintain the equipment and in some cases to calibrate it.

By contrast, intrinsically safe equipment is absolutely safe, by design. There is no risk of an event, since there is not enough energy stored or available in the circuits to cause an event. Work permits are not required.

Oxygen analyzers in hazardous area applications demand the best protection.

Intrinsically safe instruments certified to 'ib' cannot be installed in Zone 0 areas, as the measurement gas must enter the analyzer.

ATEX certified 'ia' analyzers, such as the EC91 can only be used in Zone 0 areas to provide adequate safety protection.



Optional EC91 Barrier and Power Supply Box

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Features & Benefits

- Unsurpassed safety protection
- Air calibration facility
- Maintenance-free 5 year life sampling cell
- Certified for Zone 0
- This instrument has a 36 month warranty which covers any faulty workmanship and normal component failure relating to electronic circuit cards

Applications

- Monitoring inert blanketing gas in oil and petrochemical applications
- Inert gases and Hydrogen
- Gas purity
- Glove boxes
- Oxygen deficiency monitoring
- Metallurgy
- Gas line monitoring

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Approvals:

CE and UK CA ATEX Ex II 1G EX ia IIC T4 Ga

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Technical Specification

Ranges		6 selectable 0-20, 0-200, 0-2000 (ppm) 0-2%, 0-20%, 0-30% Other ranges available on request
Resolution		0.05% of scale
Accuracy	>10ppm	±2% of reading at 68°F ±5% of reading over temperature range
	<10ppm	±2% of reading + 0.4ppm at 68°F ±5% of reading + 0.4ppm + 0.08ppm/°F over temperature range
Response Time		90% of reading within 20 seconds
Calibration Range		Ambient (20.9%) or certified gas
Measuring Cell Type		Electrochemical fuel cell

Operating Conditions

Sample inlet pressure	0.1 to 1 Barg, up to 17 Barg with optional sample system
Sample flow rate	30ml/min to 5 ltr/min
Sample temperature	32 to 104°F
Ambient temperature	32 to 104°F, RH 0-99% non condensing
Sample connections	1/8" OD compression fitting
Unsuitable gases	Corrosives and solvents

Power Requirements

Power supply	24Vdc via approved barrier mounted in the safe area
Power consumption	10W
Display Type	Digital LCD
Analog outputs	Current: 4-20mA Maximum loop resistance 400 Ohms

Cabinetry and Mounting

Enclosure	Reinforced polyester
Installation	Wall mounted
Dimensions	7.87W x 7.87H x 6.89D (inches)
Weight	6.6lbs
Ingress protection	IP66, Nema 4X
Conformity	2014/34/EU
Marking	ATEX Ex II 1G EX ia IIC T4 Ga

Options

Remote probe holder, Control room display, Aspirators, Sample systems, Alarm outputs.

Local display	Analog in place of standard digital display
Remote probes	1" NPT or BSP

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