

# EC91 Intrinsically Safe Oxygen Analyser



**Intrinsically Safe ATEX, unsurpassed certified oxygen analyser for all hazardous areas**



**Optional Remote Cell**



## 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

## Features & Benefits

- Unsurpassed safety protection
- Maintenance-free 5 year life sampling cell
- Air calibration facility
- 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

## Intrinsically Safe Oxygen Analysis

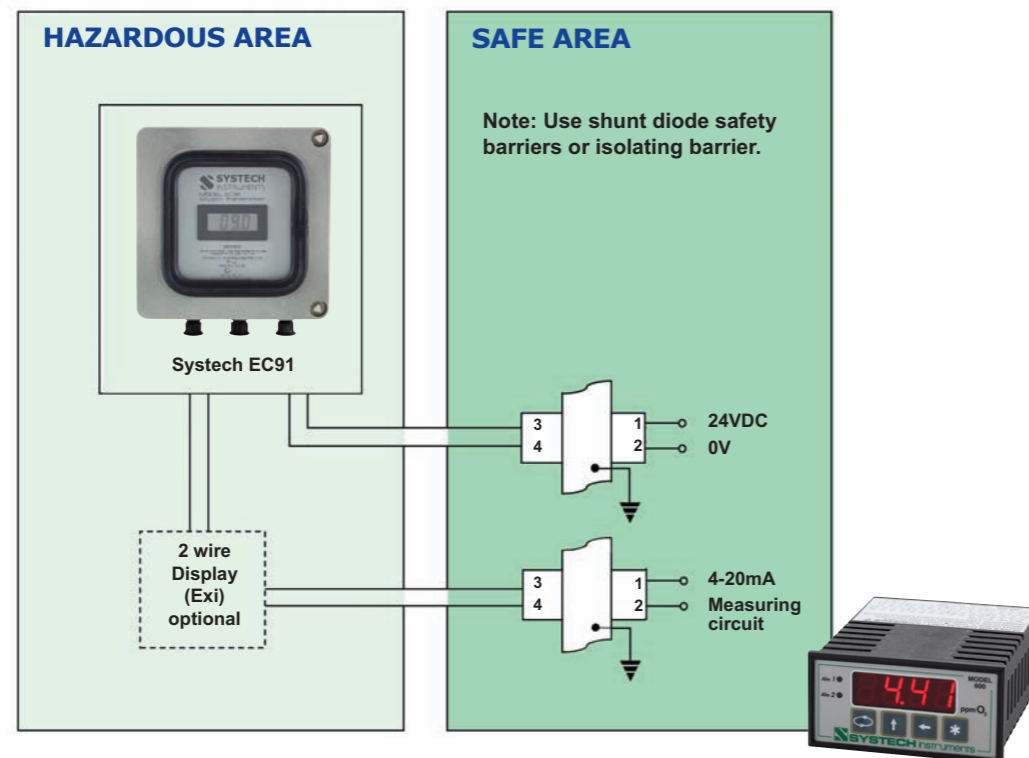
Systech Illinois have over 25 years of expertise in manufacturing gas analysers for the process industry and have an installed base of over a thousand instruments during this time. The EC91 Process Oxygen Transmitter will detect levels of oxygen as low as 1ppm, up to higher percent levels and can be 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 analyser. 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 EEx ia IIC T4.

## Installation



The sample pressure should be above 0.1 Bar. If not, a pump or aspirator should be fitted. Connection through the analyser 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 Systech 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.

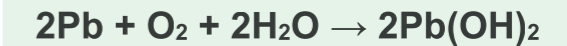
## Principle of Operation

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:



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.

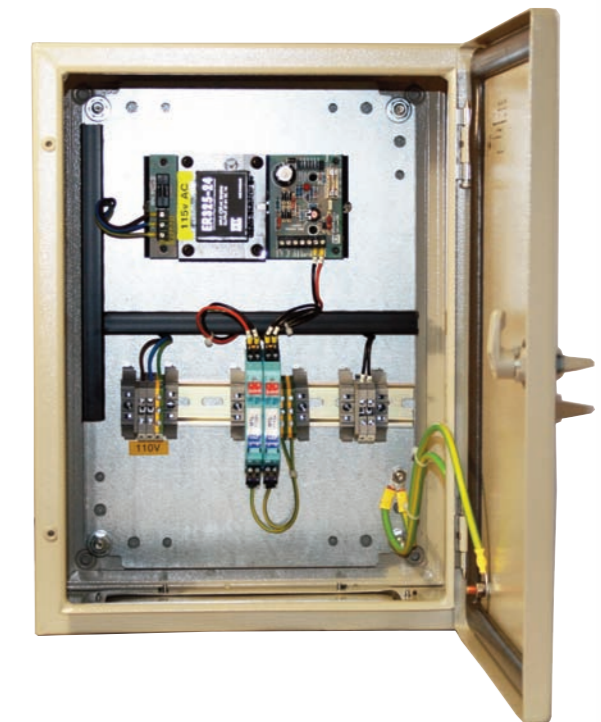
## Safety Protection

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



Optional EC91 Barrier and Power Supply Box

## Technical Specifications

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 20°C ±5% of reading over temperature range <10ppm ±2% of reading + 0.4ppm at 20°C ±5% of reading + 0.4ppm + 0.15ppm/°C 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
<b>Operating Conditions</b>	
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	0 to 40°C
Ambient temperature	0 to 40°C, RH 0-99% non condensing
Sample connections	1/8" OD compression fitting
Unsuitable gases	Corrosives, acid gases and solvents
<b>Power Requirements</b>	
Power supply	24Vdc via approved barrier mounted in the safe area
Power consumption	10W
Display Type	Digital LCD
Analogue outputs	Current: 4-20mA Maximum loop resistance 400 Ohms
<b>Cabinetry and Mounting</b>	
Enclosure	Reinforced polyester
Installation	Wall mounted
Dimensions	200W x 200H x 175D (mm)
Weight	3kg
Ingress protection	IP66, Nema 4X
Approvals	ATEX  II 1G EEX ia IIC T4
<b>Options</b>	
Local display	Remote probe holder, Control room display, Aspirators, Sample systems, Alarm outputs.
Sample pump	Analogue in place of standard digital display
Remote probes	For pressure below 0.1 Barg 1" NPT or BSP

Systech Illinois have 30 years experience of providing analysis solutions for a wide range of industries. From our manufacturing plants in the UK and U.S we produce gas analysers for industrial process industries, headspace analysers for monitoring gas flushing of food products, and our range of permeation analysers.

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