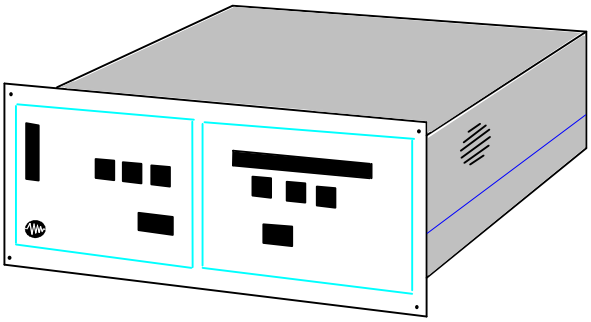
SIGNAL AMBITECH

Data Sheet



Ozone in Ambient Air Analyser Model 427

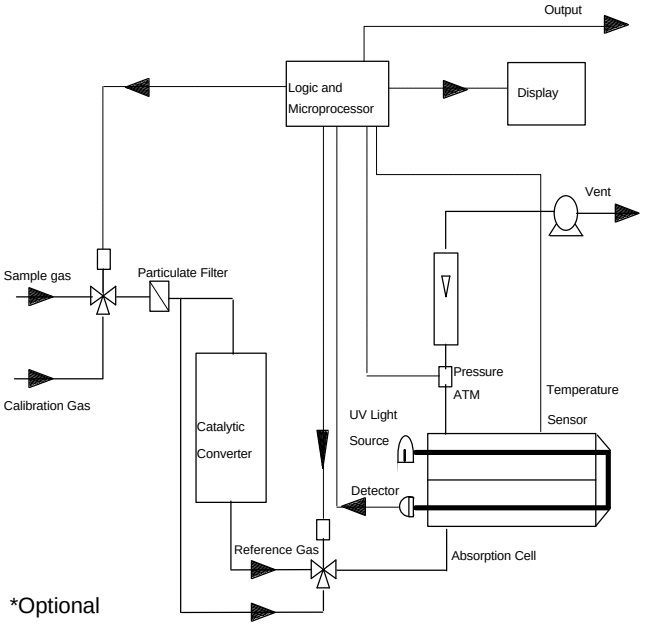
- Complies with US EPA specifications
- Microprocessor controlled
- Exceptional stability
- Powerful diagnostics
- Automatic temperature and pressure compensation
- Variety of configurations
- Low maintenance

Application

The analyser is designed to measure ambient ozone in the environment, and is available in a variety of configurations.

Principle of operation

The analyser determines the ozone concentration in the sample by measuring the attenuation of UV radiation due to ozone in the absorption cell, at a wavelength of 254 nanometres. The sample gas to be measured is drawn into the analyser by a diaphragm pump, and passes through a particulate filter before passing directly or, via a catalytic convertor, to the absorption cell. The convertor selectively changes the ozone in the sample to oxygen, thereby generating an



*Optional

ozone free reference gas. The reference gas and sample gas are sequentially introduced into the absorption cell by the operation of a solenoid valve. The gas is drawn through the absorption cell and is exposed to a beam of UV light generated by a lamp at one end, and whose light intensity is detected at the other. When the reference gas passes through the cell, a "zero" light intensity reading (I_o) is established, which is stored as a reference value by a microprocessor. When the sample gas has displaced the reference gas, the sample gas light intensity measurement (I) is made. The ratio I/I_o is a measure of the light absorbed, and is directly related to the concentration of ozone in the sample. The quantity of light absorbed by the gas is proportional to the mass of ozone contained in the absorption cell. Since the microprocessor output signal is required to be proportional to ozone volume, it is necessary to compensate for the temperature and pressure of the gas in the cell. An IC temperature transducer and a pressure transducer are used for this purpose.

Configurations

1. Basic analyser - Without calibration facility

2. Basic analyser with calibration valve. This configuration includes an internal PTFE solenoid valve, and is suitable for use with an external calibrator

3. Basic standalone ambient air quality monitor with simple internal span checker (ozone generator) and external zero air scrubber suitable for standalone use in most AQM systems

4. Transfer standard for use in calibration systems, requires an external pressurised zero air supply

5. Full reference photometer configuration, suitable for laboratory use as a primary calibrator

Ozone generator

The optional internal ozone generator utilitises both lamp power and temperature control to provide a stable source of ozone. This generator may be configured as a simple span checking device in a basic analyser, or as a stable ozone source in the transfer standard confguration. The ozone is generated by a UV lamp mounted in a flow through cell. The UV energy is in the UVB region, which converts some of the O_2 into O_3. The amount of O_3 generated is dependent upon the intensity of the UV light, which can be adjusted from the front panel. The flow path and components associated with the O_3 generator are selected for the particular configuration required.

SIGNAL AMBITECH

Specification

Analyser performance

Range	0-1000 ppb
Repeatabilty	2ppb
Linearity	±1ppb
Noise	±1ppb
Minimum detectable concentration	2ppb
Zero drift	≤0.5% / month
Span drift	≤1% / month
Response time	The analyser has a 20 second operating cycle

Ozonator performance

Ozone concentration	25 to 1000 ppb
Flow rate	6 to 8 litres/minute
Stability	±4ppb
Response time	2 minutes to 99%

Output signals

Analogue	2 simultaneous outputs available for 0-100 and 0-1000 ppb each 0-1V DC Output signal options are 0-5V, 0-10V and 4-20mA.
Digital	via RS232 socket

Sample requirements

One to three litres/minute of ambient air non condensing at analyser operating temperature

Power supply

Voltage	110V or 220/240V 50 Hz or 110V 60 Hz All -10% +6%
Consumption	100 VA

Local displays

A 16 character alphanumeric display provides the following switchable measurement and diagnostic information.

- Ozone concentration (instantaneous)
- Ozone concentration (average of last three measurements)
- Cell temperature and pressure
- Detector output pulse count for reference or sample gas
- Ozone concentration without temperature and pressure compensation

A variable area flowmeter provides indication of gas flow rate

Standard connections

These are 1/4" OD compression fittings and are used for:-

- Sample in
- Analyser vent
- Zero gas in
- Ozone output

Storage temperature

The analyser should be stored at a temperature within the range 0 to 45°C

Environmental operating conditions

The analyser is designed for rack or bench mounting in a non hazardous area.

Temperature	+15°C to 30°C
Humidity	95% RH max

Dimensions and weight

	unpacked	packed
Height	222 mm	390 mm
Width	434 mm	620 mm
Depth	570 mm	790 mm
Weight	26 kg	30 kg

Options

The model 427 may be configured for a wide range of applications, as described on the preceding page. Contact Signal Ambitech for any non-standard applications.

Signal Group Ltd, Ambitech Division, Regal Way, Faringdon, Oxon. England SN7 7BX
Telephone: + 44 (0) 1367 242660
Fax: + 44 (0) 1367 242700
Email: ambitech@signal-group.com
Web: http://www.signal-group.com

Publication reference:DS13
Date of Issue: 08/00