

# *atmosUV*

## *Continuous Emission Monitoring (CEMS/AMS) Process Analyser*



### Overview

Protea atmosUV is an Ultra Violet (UV), extractive multi component full spectrum analyser to provide analysis of multiple gas-phase emission or process components.

The analyser is offered in 19" rack mounted or transportable versions with integral auto verification with optional built in HMI with standard industrial communication.

**AtmosUV** is the latest generation of spectrophotometer gas analyser technology from Protea. The atmosUV system is an extractive multi component analyser utilising Protea's advanced multi pass cell technology. The analyser is capable of monitoring multiple gases simultaneously meeting the performance requirements of international standards.

At the heart of atmosUV is a high-resolution, robust and proven Protea spectrometer offering high signal throughput, low-noise and long lifetime of components. The atmosUV has been developed to incorporate the latest techniques in the application of spectroscopy and our proven technologies developed over many years, including:

- \* Low cost of ownership
- \* Low maintenance cost
- \* Advanced Protea S – PC or P-HMI software options to calculate, display and retransmit monitor gas concentrations
- \* Robust and light, the atmosUV combines the Protea P5000 optical bench analyser with our highly reliable multi pass sample cell incorporating a in-built sampling system.
- \* Designed for ppm-level emissions monitoring as a portable analyser, bench-top unit or as part of an fixed integrated CEM system.

The atmosUV is the result of many years of experience in the Process and Continuous Emission Monitoring field supplying advanced instruments into many demanding applications.

These advances have significantly improved performance over existing products, due to combining the proven In-Situ P5000 with the advanced multi pass sample cell used in the Protea atmos range of analysers. The atmosUV optical bench has seen extensive service over many years and incorporates all the features of the Protea P5000, accurate spectrum alignment verification and adjustment, extended life UV D2 lamp and utilises the advanced Protea chemometric software. The optical bench was designed for installation on plant in demanding applications including monitoring Total Reduced Sulphur (TRS) on recovery boilers. The atmosUV analyser requires minimal maintenance with sophisticated diagnostic routines the analyser requires minimal intervention with a high availability.

Features	Benefits
Multi-component gas analysis	The atmosUV can monitor multiple gases simultaneously
Hot wet analysis	Meets requirements of environmental agencies
Wet or dry readings reporting	Can inherently report on Wet or Dry gas basis
Automatic signal verification and recalibration	No operator intervention during routine use
Oxygen measurement normalisation (option)	Report measurement corrected to normalised O <sub>2</sub>
Low maintenance	No continuous, moving parts designed for maximum availability
Sample pump activation when temperatures above dew point	Analyser protection
Sample line, sample probe, temperature status monitoring	System protection
Diagnostics monitoring analyser / system health	Enables preventive maintenance and remote support

Principle of operation		Full Spectrum Diode Array UV Spectrometer	
Gases measured		Unlimited gases as determined by the application	
Chlorine	Cl <sub>2</sub>	0 - 50mg/m <sup>3</sup>	0 - 17ppm
Sulphur Dioxide	SO <sub>2</sub>	0 - 26mg/m <sup>3</sup>	0 - 10ppm
Nitric Oxide	NO	0 - 20mg/m <sup>3</sup>	0 - 15ppm
Nitrogen Dioxide	NO <sub>2</sub>	0 - 28mg/m <sup>3</sup>	0 - 15ppm
Ozone	O <sub>3</sub>	0 - 2mg/m <sup>3</sup>	0 - 1ppm
Ammonia	NH <sub>3</sub>	10 - mg/m <sup>3</sup>	0 - 25ppm
Total Reduced Sulphur	TRS	0 - 100mg/m <sup>3</sup>	0 - 40ppm
Hydrogen Sulphide	H <sub>2</sub> S	0 - 28mg/m <sup>3</sup>	0 - 10ppm
Dimethyl Disulphide	DMDS	0 - 38mg/m <sup>3</sup>	0 - 10ppm
Dimethyl Sulphide	DMS	0 - 26mg/m <sup>3</sup>	0 - 10ppm
Methyl Mercaptan	CH <sub>3</sub> SH	0 - 20mg/m <sup>3</sup>	0 - 10ppm
Chlorine Dioxide	ClO <sub>2</sub>	0 - 28mg/m <sup>3</sup>	0 - 10ppm
Water Vapour	H <sub>2</sub> O	0 - 30%	
Oxygen	O <sub>2</sub>	0 - 30%	

### Protea atmosUVi

Same specification as the atmosUVr fitted with a HMI and I/O unit. Incorporates analogue transmitters (0—20mA, 4—20mA, 0—5V) one per monitored range optional relays and digital inputs) Each unit can accept analogue inputs from third party analysers / sensors for example stack flow, particulates, pressure using the data to report in mass units ie kg/hr.



### Protea atmosUVr

Extractive Infra-Red multi component analyser housed in a 19" 5U chassis utilising a 1m multi pass cell, capable of monitoring multiple UV absorbing gases. Fitted with an auto verification module will automatically zero and verify calibration by introducing test gas directly into the cell or sample probe. The monitored concentrations (ppm, mg/m<sup>3</sup>, %), diagnostics, data logging and plant interface are a function of the analyser control unit Protea P-PC or P-HMI which can support multiple analysers (see datasheets 19-6PD100 and 19-6PD101).



### Protea atmosUVt

Transportable Extractive UV multi component analyser housed in a rugged case, can be used as a transportable source testing analyser or back up CEMs in the event of the fixed CEMS failure. Same specification as the atmosUVr and atmosUVi incorporating HMI.

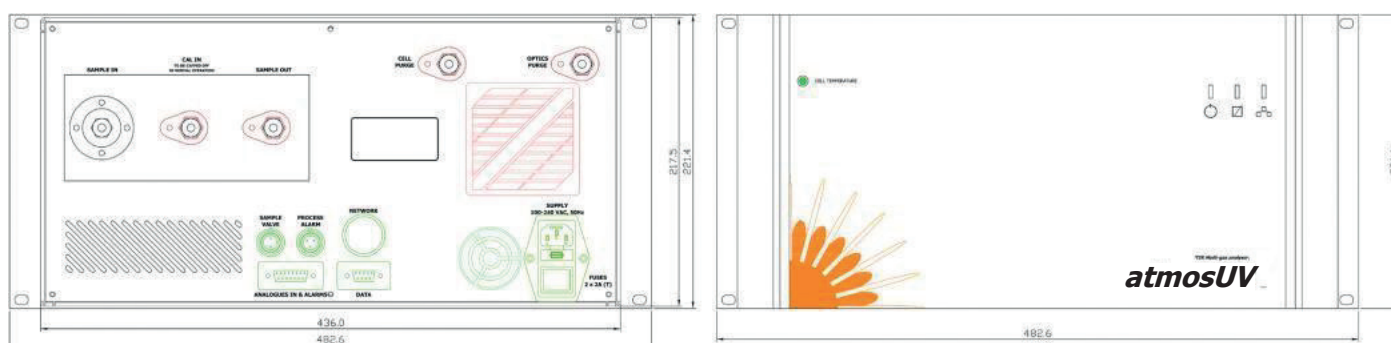


All versions have power distribution to the sample probe, heated line and accept low temperature indication. The heated line temperature is controlled by the analyser

## Specification

Principle of operation	Ultra-violet absorption full spectrum method.	
Spectral range	180nm to 400nm.	
Ultra-violet source	Extended life deuterium lamp. (Typically 7000 hrs).	
Ultra-violet detector	Miniature 1024 bit photo diode array.	
Cross-sensitivity	Minimal due to full spectrum principle and advanced algorithms in the processor software.	
Pressure compensation	To allow for atmospheric/cell pressure variation.	
Accuracy	Typically $\pm 2\%$ of full scale concentration but dependent on application.	
Response time	Application dependent but typically 60 seconds to T90.	
Calibration requirements	Supplied pre-calibrated. Short term drift of less than the quoted accuracy is removed by zero calibration, carried out automatically, typically every 24 hours depending on application.	
Enclosure	Robust aluminium case body Conforms to DIN 41494 and IEC 297-1 Paint.	
Operating environment	Operating temperature range -20°C to 55°C (-4°F to 130°F).	
Materials in contact with sample	Calcium fluoride, glass, Ni-coated Al cell, Kalrez® and fused silica.	
Gas Cell	Path length	1 metre. (Other lengths on application).
	Materials	Ni-coated Al cell. Proprietary alloy mirror substrate with multilayer coating.
	Volume	300ml.
	Temperature	Selectable Ambient, 40°C, 60°C, 180°C application dependant.
Services required	Power	90-250V 80VA required for lamp PSU, head cooler fan (application dependent) and electronics.
	Instrument Air	Instrument air for the analyser void purge, auto zero and sample cell protection, controlled by the atmosUV. Pressure 2.5-3 barg; flow rate 1litre/min.
Mounting	Rack enclosure 19" 3u	
Weight	10kg (22lb)	
Physical dimensions	Height 3U (3HE) Width 436 (17.16") Depth 365 (14.37")	

## Dimensions atmosUVr



## Protea Systems

Protea design and manufacture fully integrated bespoke systems housing our range of analysers in various enclosures and shelters to meet the project specification this includes supply and control of all the necessary sample handling components such as heated sample probes, heated lines and fully compliant CEMS DAS.

Distributed by:

This Datasheet is a guide to the product and Protea Ltd reserve the right to modify the product without notification.