atmosIR

Continuous Emission Monitoring (CEMS/AMS) Process Analyser

Overview

Protea atmosIR is an infra-red (IR), extractive multi component analyser to provide analysis of up to six 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.

AtmosIR is the latest generation of photometric gas analyser technology from Protea. The atmosIR system is an extractive multi component analyser utilising Protea's advanced multi pass cell technology. The analyser is capable of monitoring up to six (6) gases simultaneously meeting the performance requirements of international standards.

At the heart of atmosIR is a high-resolution, robust and proven Protea photometer offering high signal throughput, low-noise and long lifetime of components. The AtmosIR has been developed to incorporate the latest techniques in GFC photometry and our proven technologies developed over many years, resulting in:

- 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 AtmosIR combines the Protea P2000 optical bench analyser with our highly reliable multi pass sample cell incorporating an 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 AtmosIR is the result of many year experience in the Process and Continuous Emission Monitoring field suppling advanced instruments into many demanding applications.

These advances have significantly improved performance over existing products, due to combining the proven In-Situ P2000 with the advanced multi pass sample cell used in the Protea atmos range of analysers. The atmosIR optical bench has seen extensive service over many years and incorporates all the features of the Protea P2000 including long life IR source (>10 years), high specification DC filter wheel motor (>10 years) and state of the art signal processing. The optical bench was designed and utilised in high vibration application such as marine CEMS so has a "second to none pedigree" running sophisticated diagnostic routines the analyser requires minimal intervention and therefore high monitoring availability.

The atmosIR in addition to monitoring the six (6) IR absorbing gases can also monitor Oxygen which enable the analyser to report concentrations normalised to a set O2 level as required by Environmental Agencies.

Features	Benefits
Multi-component gas analysis	Each atmosIR can measure up to six components
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 or CO_2 measurement normalisation (option)	Report measurement corrected to normalised O_2 or CO_2
Low maintenance	Only one moving part, designed for maximum availability
Sample pump deactivation when temperature is below dew point	Analyser protection
Sample line, sample probe, temperature status monitoring	System protection
Diagnostics monitor analyser / system health	Enables preventive maintenance and remote support

Components monitored		Minimum Range (Normally up to 100%)	
Carbon Monoxide	CO	0 - 50mg/m³	0 - 40ppm
Ethane	C_2H_6	0 - 67mg/m³	0 - 50ppm
Ethylene	C_2H_4	0 - 156mg/m³	0 - 125ppm
Propane	C_3H_8	0 - 49mg/m³	0 - 25ppm
Methane	CH_4	0 - 54mg/m³	0 - 75ppm
Butane	C_4H_{10}	0 - 65mg/m³	0 - 25ppm
Trichloroethane	$C_2H_3Cl_3$	0 - 149mg/m³	0 - 25ppm
Carbon Dioxide	CO_2	0 - 50mg/m³	0 - 25ppm
Sulphur Dioxide	SO_2	0 - 72mg/m³	0 - 25ppm
Nitric Oxide	NO	0 - 100mg/m³	0 - 75ppm
Nitrogen Dioxide	NO_2	0 - 103mg/m³	0 - 50ppm
Nitrous Oxide	N_2O	0 - 148mg/m³	0 - 75ppm
Ammonia	NH_3	0 - 19mg/m³	0 - 25ppm
Water in Gases	$H_2O(g)$	0 - 400mg/m³	0 - 500ppm
And many more			

Protea atmosIRr

Extractive Infra-Red multi component analyser housed in a 19" 5U chassis utilising a 4.2m multi pass cell, capable of monitoring up to six (6) gases. Fitted with a 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/m3, %), diagnostics, data logging and plant interface are a function of the analyser control unit Protea P-PC or Protea P-HMI which can support multiple analysers (see datasheets 19-6PD100 & 19-6PD101).

Protea atmosIRi

Same specification as the atmosIRw 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 atmosIRt

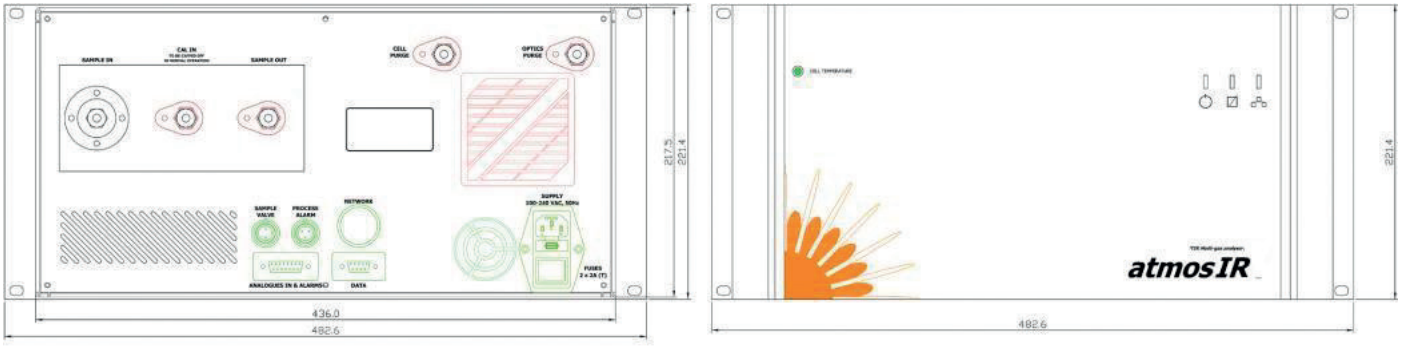
Transportable Extractive Infra-Red multi component analyser housed in a rugged case, can be used as a transportable source testing analyser or back up CEMs in the event of the fixed CEMS failure. Same specification as the atmosIRr and atmosFIRi incorporating HMI.

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	Infra-red multi wavelength photometer.	
Spectral Range	Specific application dependent wavelengths (up to 8) are selected between 2-12μm.	
Infra-red source	Enclosed nichrome filament.	
Infra-red detector	Solid state pyroelectric element.	
Cross-sensitivity	Minimal due to the wavelength selection, Gas Filter Correlation and advanced algorithms in the processor software.	
Accuracy	Typically ±2% of full scale concentration but dependent on application.	
Response time	Application dependent but typically 60 seconds to T90.	
Enclosure	Mild Steel with high protection finish. .	
Operating environment	Operating temperature range -20°C to 55°C (-4°F to 130°F).	
Materials-contact with gas	Barium Fluoride (BaF_2), Ni-coated Al cell, Kalrez®	
Gas Cell	Path length	4.2m standard, 6m available as special.
	Materials	Ni-coated Al cell. Proprietary alloy mirror substrate with multi-layer coating.
	Volume	300ml.
	Temperature	Selectable Ambient, 40°C, 60°C, 180°C application dependant.
Services required	Power for analyser with PSU 115V/230V 175W.	
	Power for heated line ~ 120W/m.	
	Power for heated sample probe 115V/230V 520W.	
	Instrument air for auto zero and sample cell protection, controlled by the analyser, 2 barG; flow rate 3 litre/min Intermittent during Auto-zero (typically 8 minutes every 12 hours).	
Interconnection cable	2 twisted-pair cores with individual screen typically allows up to 1000m separation between Analyser and Protea P-PC or P-HMI Analyser Control Unit in atmosIRw version.	
Weight	10kg	
Physical dimensions	Analyser 440 (17.3") x 450 (17.7") x 222 (8.7") (5U 19" rack mountable)	

Dimensions atmosIRr



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:

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