atmosFIR EX

When the measurement of industrial gases requires installation in an Zone 1 and Zone 2 area, the atmosFIR EX analyser system provides a complete certified measurement system that allows the sampling of non-flammable and flammable gases, utilizing Protea's multigas atmosFIR platform.

The atmosFIR EX system is provided in a sealed stainless steel cabinet with a constantly controlled and monitored purge, providing a system that conforms to EN60079-2 purge type. A dedicated purge controller is mounted to the enclosure which provides control of the purge cycle and monitoring of the normal operating pressure, and with redundant microcontrollers this provides the redundancy required for a Zone 1 purge system.

On application, Protea can provide an atmosFIR EX system for Zone 1or Zone 2 installation. Zone 1 applications are often found when the analysis system has to measure flammable gases and the potential of an internal source of release has to be engineered in. This also will included the limitation of sample gas pressure will specifically designed sampling system by Protea.

The core analyser module in the atmosFIR EX system is the atmosFIR multigas FTIR, capable of the instantaneous measurement of hundreds of gases. Be it for emissions monitoring from standard combustion processes (NOx, CO, SO2, HCl), multiple VOC emissions measurements or process control measurements, such as siloxanes from landfill gas, the power of Protea's FTIR analyser means the atmosFIR EX system can be used across multiple applications.

Ex

ATEX II 2 G Ex pxb IIC T4 Gb -20°C≤Tamb≤+45°C
ATEX II 3 G Ex pzc IIC T4 Gb -20°C≤Tamb≤+45°C

atmosFIR EX is a complete multipoint, multigas FTIR analyser system provided in a purge enclosure for installation in a Zone 1 or Zone 2 location.

- Upto 12 point sampling
- Stack Emissions Monitoring
- Process Control
- Landfill and Biogas monitoring
- EN60079-2 compliant

Purge Hardware Specifications

Certificate Number	ExVeritas 16ATEX0171X
Certification Type	Zone 1: ATEX II 2 G Ex pxb IIC T4 Gb -20°C≤Tamb≤+45°C Zone 2: ATEX II 3 G Ex pzc IIC T4 Gb -20°C≤Tamb≤+45°C Note: atmosFIR EX cabinet design is same for Zone 1 and Zone 2. A specific controller for Zone 1 is required.
Purge Flow	200 l/min instrument air
Purge Time	25 minutes
Remote Connection	Modbus Serial, Modbus TCP/IP, OPC Server, Remote Desktop
Weight	300kg, including FTIR analyser and heated sampling system modules
Dimensions	2000 x 650 x 800
Power	110VAC or 220VAC
Power Disconnect	Zone 1: Disconnection of power on loss of pressure Zone 2: No disconnection of power on loss of pressure, only a warning is required (via alarm relay in purge controller)

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atmosFIR is the latest generation of FTIR gas analyser technology from Protea. The atmosFIR analyser improves upon previous FTIR technology and represents one of the most cost-effective and flexible analytical products on the market today.

At the heart of atmosFIR is a high-resolution, robust and proven FTIR spectrometer offering high signal throughput, low-noise and long lifetime of components. atmosFIR has been developed to incorporate the latest improvements and advantages in technology. atmosFIR combines an FTIR analyser with an in-built sampling system and is designed for sub ppm-level monitoring as part of an installed CEM or process control system

As part of the atmosFIR EX system design is the measurement of up to 12 sample points, with automated sequential control from PAS-Pro FTIR analyser software. This allows, for example, the measurement of both process gas measurement and emissions monitoring with the one analyser system. For ATEX Zone 1 applications requiring the measurement of flammable gases, the management of the internal source of release requires external ATEX certified sample control valves mounted to the exterior of the atmosFIR EX rack.

The industrial PC controlling atmosFIR EX gives the option of remote control of the system via Modbus protocols, OPC Server or Remote Desktop applications. Data is saved continuously, with separate data logs per measurement stream.

FTIR Specifications

Double-pivot interferometer with increased robustness. Permanently aligned optics, giving repeatable measurements and high light throughput. The scanning mechanism has a lifetime guarantee.	
Resolution	1cm-1,2cm-1, 4cm-1, 8cm-1 typical resolutions, variable on application. 0.5cm-1 available as special
Optics:	Zinc Selenide beamsplitter (non-hygroscopic)
Spectral Range:	485 - 8500cm-1
Reference laser:	Solid state laser (no scheduled maintenance required). Long lifespan (10 years) compared with HeNe laser
Source:	Mid-IR source, with electronic stabilization for long lifespan
Detector:	DTGS with signal sampling at 24-bit ADC
Sample Cell	Materials: Ni-coated Al cell. Proprietary alloy mirror substrate with multi-layer coating. Volume: 300ml Pathlength: 4.2m standard pathlength. 6m available as special Temperature: 60°C standard process applications. 180°C for emissions, but air conditioning of cabinet required
Measurement Units	ppb, ppm, mg/m³; OU
Data Connection	OPC Server, Modbus TCP/IP, Modbus RTU/ASCII via Serial, 4-20mA Analogue
Manual data retrieval	Download via USB (.csv file). Separate log file for each measurement stream.

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FTIR Specifications

No. measurement points	Up to 12. Flammable and non-flammable gas measurement
Sample Flow	Constant by-pass flow per bank of 4 sample points
Temperature Control	Heated Stream Selection Modules (HSSM) controlled to 60°C
Oxygen measurement (optional)	Electrochemical sensor. Range 0-100%, 0-25%.
Sample Pressure	Sampling under negative pressure via internal sample pumps 5mbar sample pressure relief for sampling of flammable gas as pressure, limiting internal source of release
Sampling Sequence	Customizable sampling sequence via PAS-Pro software, including automated pause, zero and span

Typical Measurements for atmosFIR EX

atmosFIR EX can be provided with core atmosFIR FTIR gas analyser set-up for any number of different process or emissions applications.
Contact Protea for specific gas analysis requirements.
The following are example of typical applications and ranges for the atmosFIR FTIR analyser.

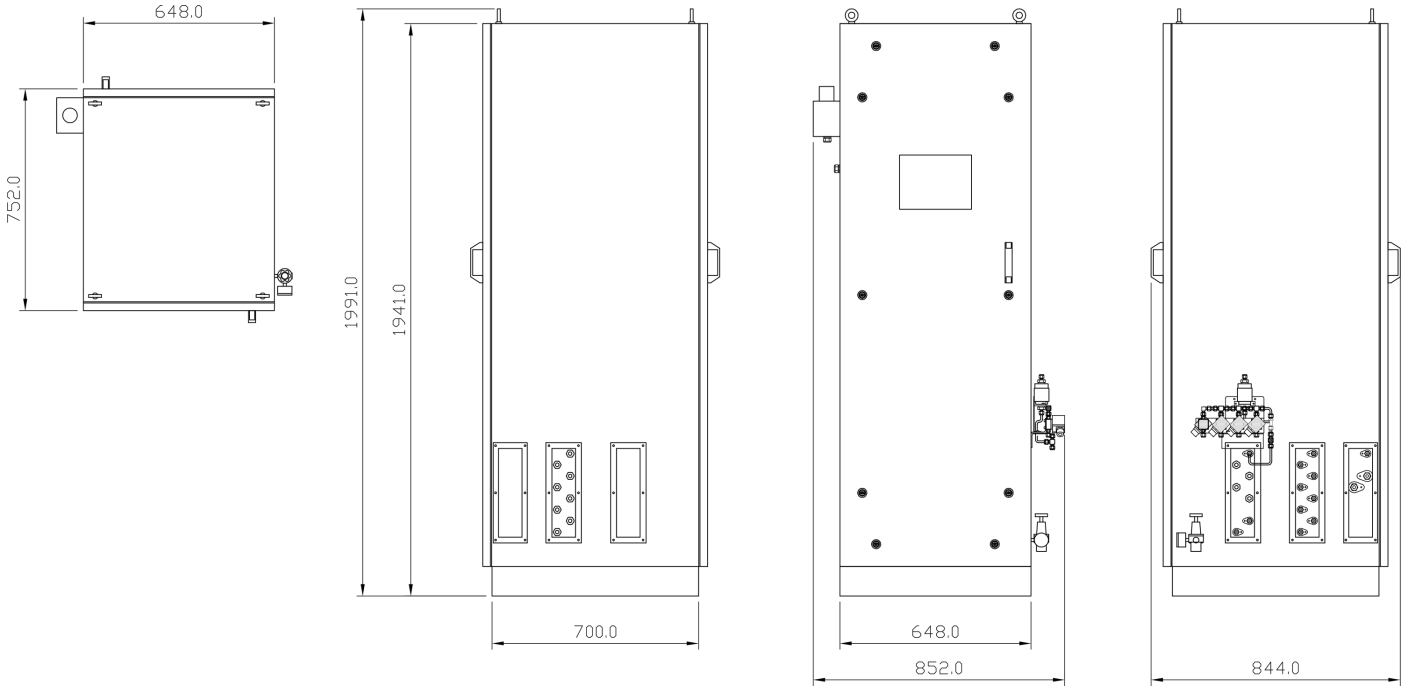
Typical detection limit	<0.2ppm (gas dependent)		
Typical Response Time	120secs at 1cm-1 resolution. (T90, direct).		
Linearity	<2% range	Repeatability (σ)	<1% range

Standard Combustion Emissions Model

Component	Ranges / mg/m3	Lower detection Limit (LDL) / mg/m3	Component	Ranges / mg/m3	Lower detection Limit (LDL) / mg/m3
CO	0-75; 0-1000	0.6	CH4 (Methane)	0-50; 0-1000	0.1
NO	0-200; 0-600	1.0	C2H6 (Ethane)	0-50; 0-1000	0.1
NO2	0-200; 0-600	0.6	C3H8 (Propane)	0-50; 0-1000	0.8
N2O	0-50; 0-400	0.4	C2H4 (Ethene)	0-50; 0-1000	0.4
SO2	0-75; 0-1000	0.6	HCHO (Formaldehyde)	0-20; 0-100	0.2
NH3	0-15; 0-50	0.1	TOC (Indication only)	0-50; 0-1000	-
HCl	0-15; 0-100	0.2	H2O	0-40%	0.02%
HF	0-15; 0-50	0.2	CO2	0-20%	0.005%

Siloxanes Landfill and Biogas Analysis

Component	Ranges / mg/m3	Lower detection Limit (LDL) / mg/m3	Component	Ranges / mg/m3	Lower detection Limit (LDL) / mg/m3
L2	0-20	0.10	L4	0-20	0.05
D3	0-20	0.62	D5	0-20	0.15
L3	0-20	0.03	L5	0-20	0.16
L4	0-20	0.60	D6	0-20	0.13
D4	0-20	0.05	TMS	0-20	0.13
Component	**Ranges / %Vol**	**Lower detection Limit (LDL) / %Vol**			
CH4	0-100	0.001			
CO2	0-100	0.10			
H2O	0-10	0.10			
H2S	0-1	0.005			



Supplier: