

CEM / IN-LINE GAS ANALYSERS

NO, NO₂, NO_x, NH₃, SO₂, BTX – DX 3000

INTRODUCTION

The reduction of gas emission on industrial plants is now a global concern for the environment as climate change, forest devastation and respiratory diseases are endangering present and future generations.

The aim of Awa Instruments is to provide worldwide reliable and cost effective environmental monitoring solutions to control emission gases.

With a 10-years experience on ammonia gas detection by UV spectroscopy and hundreds of on-line analysers installed, we now extend our technology to a wide range of UV absorbing gases.

Key factors for successful on-line analysis as stability, low maintenance and low operating cost have oriented our design to the DOAS method (Differential Optical Absorbance Spectroscopy) based on the Beer-Lambert law. No sampling system is needed reducing the maintenance and installation costs. An air purge circuit maintains clean the optics.

Typical applications are SCR and SNCR processes where simultaneous measurement of NO, NO₂, NH₃ is necessary to control the DeNO_x process, as well as other chemical processes.

MAIN APPLICATIONS:

- Power Plants
- Waste Incinerators
- Chemical Industry
- Cement Industry
- Mineral Wood Industry
- Fertilizer Industry



TYPICAL PERFORMANCE DATA

Compound	Range of measurement for 1 meter path (1)	Repeatability for measurement time of 10 sec (2)	Zero drift per month (3)	Span drift per month
NH (ppm)	100	+/- 0.01	+/- 0.5	+/- 2%
NH3 (mg/m3)	75	+/- 0.01	+/- 0.3	+/- 2%
NO (ppm)	1000	+/- 0.3	+/- 1.2	+/- 2%
NO (mg/m3)	1500	+/- 0.4	+/- 1.5	+/- 2%
NO2 (ppm)	1500	+/- 0.4	+/- 10	+/- 2%
NO2 (mg/m3)	2500	+/- 0.8	+/- 20	+/- 2%
SO2 (ppm)	1000	+/- 0.1	+/- 1.2	+/- 2%
SO2 (mg/m3)	3000	+/- 0.3	+/- 3	+/- 2%
Benzene (ppm)	30	+/- 0.03	+/- 3	+/- 2%
Benzene (mg/m3)	100	+/- 0.1	+/- 1	+/- 2%
Toluene (ppm)	10	+/- 0.04	+/- 0.3	+/- 2%
Toluene (mg/m3)	50	+/- 0.3	+/- 1	+/- 2%
Xylene (ppm)	10	+/- 0.02	+/- 0.1	+/- 2%
Xylene (mg/m3)	50	+/- 0.1	+/- 0.4	+/- 2%



- (1) For longer paths, range repeatability and drift are proportionally smaller
- (2) High level of dust may affect the repeatability
- (3) Electronic drift with ambient temperature within +/- 10°C

EMITTER:

Air purge	Flow 5 – 50 l/min, tubing 1/4"
Ambient temperature	0°C (32°F) to 70°C (160°F)
CE Standards	Electromagnetic compatibility EN50081- 2, EN50082 -2, EN55011
Enclosure	IP65, stainless steel
Flange for stack fixation	ISO PN 6, inside diameter: 50mm, outside diameter: 140mm
Dimension	400 x 200 x 160 mm W x H x D
Weight	< 10 kg

RECEIVER:

Air purge	Flow 5 – 50 l/min, tubing 1/4"
Ambient temperature	0°C (32°F) to 70°C (160°F)
CE Standards	Electromagnetic compatibility EN50081- 2, EN50082 -2, EN55011
Enclosure	IP65, stainless steel
Flange for stack fixation	ISO PN 6, inside diameter: 50mm, outside diameter: 140mm
Dimension	400 x 200 x 160 mm W x H x D
Weight	< 10 kg
Connection to control unit	2 wires RS485 – 1 km max
Power supply	110-130V or 220-240V / 10 VA / 50-60Hz – Internal voltage selector

ANALYSER:

Measurement rate	5 seconds to 15 minutes
Data storage	4000 measurements
Communication	RS485 with MODBUS, Ethernet on RJ45, RS232 with Windows Hyperterminal
Outputs	4-20 mA, isolated, 500 Ohm max, screw terminals 4 alarms or default relay contacts, screw terminal, 2A max
Display	240 x 128 pixels LCD with backlight
Power supply	110V to 240V (50-60 Hz) 30 VA, Internal voltage selector
Ambient temperature	0°C (32°F) to 60°C (140°F)
Dimensions	Rack 19" 3U (482.6mm x 133mm x 430mm)
Weight	< 10kg

EX3000-301

INTRODUCTION

The Model EX3000-301 gas analyser is an ammonia gas monitoring system specifically designed for stack emission, motor exhaust, ambient air monitoring and gas manufacturer.

The analyzer is mounted in a 19" rack. The front panel incorporates a flow meter to check the circulation of the analysed gas or zero gas as well as a large LCD display touch screen.

This tactile screen displays the analyser results and provides menus and messages allowing the user to easily control the operation of the analyser.



MEASUREMENT PRINCIPLE

The measurement principle is based on the UV absorption spectrum of the ammonia gas (NH₃) in the UV range.

The periodic structure of the absorption bands coming from the different levels of rotational energy of the gas molecules is analysed by performing a Fourier Transform on the absorption spectrum with a high speed DSP*.

At the opposite of the FIR approach where the Fourier Transform is done by optical components, the Fourier transform in the UV range is done by electronic circuits, which constitutes a more economical solution.

The selectivity of the analyser is guaranteed by the typical periodic structure of the analysed gas, different for any other gases.

The optical path length of the analyser is adapted to a range of measurement from ppm to hundreds of ppm.

Times to times, an auto-zero on an external zero air is performed to guaranty accurate measurements.

The sensitivity is determined by the optical path length of the quartz flow cell, which remains perfectly constant and thereby eliminates periodic recalibration of the analyser.

A calibration verification (or recalibration under exceptional circumstances) may have to be conducted but only over a period of several months due to the inherent stability of the measurement system.

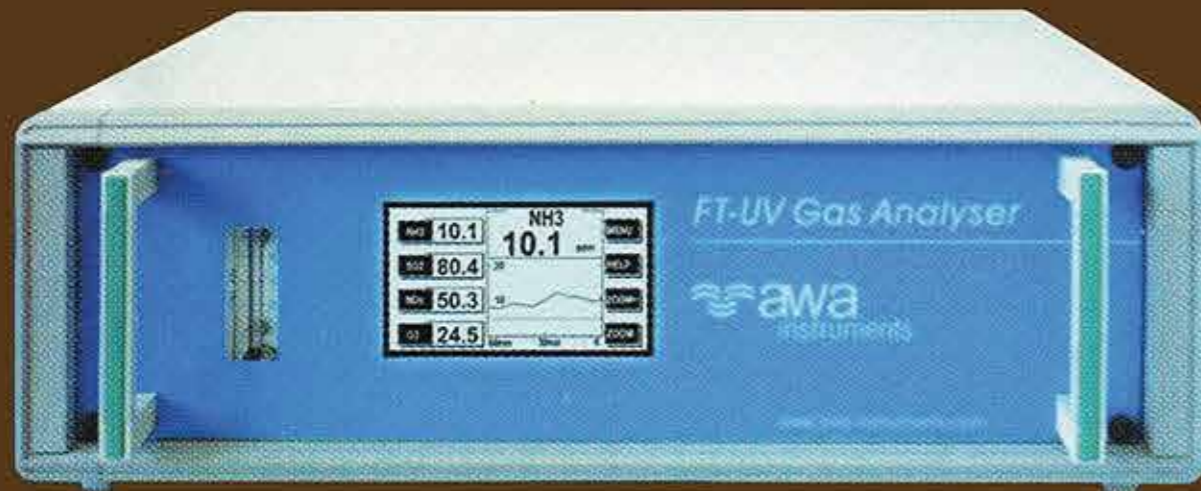
*DSP: Digital Signal Processor

SPECIFICATIONS

Sampling gas	Pressure	: min 0.2 bar (3 PSI), max 1 bar (15 PSI)
	Flow	: 1 to 5 litre / min (0.25 to 1.5 GPM)
	Temperature	: min 0°C (32°F), max 60°C (140°F), heated version at 150°C (300°F)
	Fittings	: Swagelok, stainless steel 316 for tube OP 1/4"
Zero gas	Pressure	: min 0.2 bar (3 PSI), max 1 bar (15 PSI)
	Flow	: 1 to 5 litre / min (0.25 to 1.5 GPM)
	Temperature	: min 0°C (32°F), max 60°C (140°F)
	Fittings	: Swagelok, stainless steel 316 for tube OP 1/4"
Range	0 to 100 ppm of NH ₃ , (other ranges on request)	
Accuracy	+/- 0.5 ppm or +/- 2% of reading , whichever is greater	
Measurement rate	2 seconds to 1 hour	
Data storage	4000 measurements	
Communication	RS485 with MODBUS, Ethernet on RJ45, RS-232 with Windows Hyperterminal	
Output	4-20mA, isolated, 500 Ohm max, screw terminal 4 alarms or default relay contacts, screw terminal, 2A max	
Power supply	110V to 240V (50-60Hz) selectable by internal switch, 30 VA	
Ambient temperature	0°C (32°F) to 60°C (140°F)	
Dimensions	Rack 19" 3U (482.66mm X 133mm X 430mm)	
Weight	< 15kg	

*All specifications are subject to change without notice. Some characteristics refer to optional parts.

EX3000-302



INTRODUCTION

The model EX3000-302 gas analyser is an hydrogen sulfide gas monitoring system specifically designed for wastewater treatment plant, H₂S removal process and calibration gas manufacturer.

The analyser is mounted in a 19" rack. The front panel incorporates a flow meter to check the circulation of the analysed gas or zero gas as well as a large LCD display touch screen.

This tactile screen displays the analyser results and provides menus and messages allowing the user to easily control the operation of the analyser.

MEASUREMENT PRINCIPLE

The measurement principle is based on the UV absorption spectrum of the hydrogen sulfide (H₂S) in the UV range.

The UV light is generated by a xenon lamp guaranteed for 109 flashes, giving a lifetime of 10 years with continuous operation.

The H₂S is measured directly in a quartz gas flow cell without any converter, suppressing any maintenance or parts replacement.

There is no risk of interference with CO₂, CH₄ or H₂O as these gases do not have UV absorption.

Times to times, an auto-zero on an external zero air is performed to guaranty accurate measurements.

The sensitivity is determined by the optical path length of the quartz flow cell, which remains perfectly constant and thereby eliminates periodic recalibration of the analyser.

A calibration verification (or recalibration under exceptional circumstances) may have to be conducted only over period of several months due to the inherent stability of the measurement system.

SPECIFICATIONS

Sampling gas	Pressure	: min 0.2 bar (3 PSI), max 1 bar (15 PSI)
	Flow	: 1 to 5 litre / min (0.25 to 1.5 GPM)
	Temperature	: min 0°C (32°F), max 60°C (140°F), heated version at 150°C (300°F)
	Fittings	: Swagelok, stainless steel 316 for tube OP 1/4"
Zero gas	Pressure	: min 0.2 bar (3 PSI), max 1 bar (15 PSI)
	Flow	: 1 to 5 litre / min (0.25 to 1.5 GPM)
	Temperature	: min 0°C (32°F), max 60°C (140°F)
	Fittings	: Swagelok, stainless steel 316 for tube OP 1/4"
Range	0 to 500 ppm of H ₂ S, maxi 1500 ppm (other ranges on request)	
Accuracy	+/- 0.5 ppm or +/- 2% of reading , whichever is greater	
Measurement rate	5 seconds to 1 hour	
Data storage	4000 measurements	
Communication	RS485 with MODBUS, Ethernet on RJ45, RS-232 with Windows Hyperterminal	
Output	4-20mA, isolated, 500 Ohm max, screw terminal 4 alarms or default relay contacts, screw terminal, 2A max	
Power supply	110V to 240V (50-60Hz) selectable by internal switch, 30 VA	
Ambient temperature	0°C (32°F) to 60°C (140°F)	
Dimensions	Rack 19" 3U (482.66mm X 133mm X 430mm)	
Weight	< 15kg	

**All specifications are subject to change without notice. Some characteristics refer to optional parts.*