GUARDIAN S 1000

SO3 Transportable Monitoring system

WHY IT'S IMPORTANT TO MONITOR SULPHUR TRIOXIDE

Sulphur trioxide (SO3) is formed as a by-product during the combustion of fossil fuels for power generation and is also used or produced in many industrial processes. At temperatures below about 200℃, it combines with water vapour to form sulfuric acid which has deleterious effects on plant surfaces and on the environment. In power generation, SO3 measurements provide data to allow the operator to burn fuel in the most efficient way to minimise corrosion of the plant and limit acid discharges to the environment.

Monitoring of SO3 is also important where it is formed as a by-product, e. g. in DeNOx systems.

The ETG SO3 monitor has been designed to meet a wide range of measuring requirements. The instrument is portable and suitable for continuous and short-term measurements. The unit is auto-calibrating in a user defined cycle, which can be adjusted directly on the screen. In addition to the analogue 4 ... 20mA output, the SO3 monitor is equipped with an electronic data logger to record the measurements. Data can be recorded up to one year and exported to Excel for further processing.

PRINCIPLE OF OPERATION

The SO3 or H2SO4 in the gas sample is absorbed as sulphate ions (SO42 -) in an aqueous solution of propan-2-ol in water. The solution is passed through a bed of barium chloranilate. The acid chloranilate ions created are measured in a continuous flow photometer. By maintaining a constant ratio of flow rates for the gas and the propan-2-ol absorbing solution, the concentration of acid chloranilate ions can be directly related to the sulphate ion concentration in the absorbing solution, and hence the SO3 concentration in the gas. Above acid dew point temperature > 130 ℃

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TECHNICAL FEATURES

Ranges	1 - 12,5 | 1 - 25 | 1 - 50 | 1 - 100 ppm
	1 - 200 ppm (after changing instruments pmp-speed)
Accuracy	+/- 5 % of reading (in calibrated range)
Lag time	approx. 5 min.
Response	(90 % FSD) approx. 10 min.
	(depending on umbilical length) max. 5 m
Solution consumption	(propan-2-ol) max. 1 ml/min
Calibration solution	(˜ 30 ml/calibration)
Ambient temperature	0 - 55 ℃
Operating temp.	30 ℃ by installed cooling unit
IP ingress protection	IP54

Module dimensions

Analysis Module	19" unit, (l/w/h = 60/55/55 cm, w=50 kg)
Control Module	19" unit, (l/w/h = 60/55/25 cm, w=20 kg)
Power Requirement	230 V 50/60 Hz or 110 V 50/60 Hz, 350 W
Signal Output	4 ... 20 mA output for external recorder
	(Data logger included with the capacity of 1 year collection of data)
Probe Length	0.5 m, 1 m, 1.2 m, 1.5 m, 2 m (standard 1,5 m)
Filter for probe	for probe for coal fired power plant or plants with high dust emission.
	Automatic purge system integrated (adjustable on screen)
Maximum temperature	Flue gas temperature up to 400℃ (up to 550℃ with special probes)

Special heated probe with several length.
Designed to operate in harsh condition in coal fired power plant or plants with high dust emission. Automatic purge system integrated (adjustable on local monitor).