PRODUCT SPECIFICATIONS

Thermo Scientific GM-5000

Air Quality Monitor

The Thermo Scientific™ GM-5000 provides real-time concentrations of airborne priority pollutants. The unit incorporates laser based particle counting for particulate measurement and electrochemical sensing for gas measurement and provides unattended monitoring with continuous real-time data transmission to a central location and/or internal memory.

Features

- Measurements for gas (NO_2, SO_2, O_3, CO), particulate (PM2.5, PM10), or both gas and particulate
- Active sampling, software based temperature and cross-interference compensation
- One year on board data storage
- Communication through browser interface over WiFi
- Automatically restarts to recover from power outages

Introduction

The Thermo Scientific GM-5000 draws sample through a screen and heated tube, minimizing larger particles and excess moisture and allowing gaseous pollutants and particulate matter to be detected. For units configured with both gas and particulate measurement, the sample enters a laser based optical particle counter (OPC) that detects both the number of particles and the particle size distribution. The factory calibration calculates the approximate mass concentration. The 6 measurements available are NO_2, SO_2, O_3, CO, PM2.5 and PM10.

The sample continues through a small fan and filter, and enters the gas sensing chamber. The concentration of the four standard gases are measured by electrochemical cells and the concentration is calculated. The measurement for both particulate and gas, as well as sample stream temperature, pressure, relative humidity, and date/time stamp, are sent to a web server running on the instruments embedded computer and transmitted through a 3G/4G modem as well as a local WiFi dongle. The data may be viewed on a computer, tablet or phone running a standard browser. The same data is stored locally on a micro SD card and may be retrieved through the browser.

Following measurement, the sample exits into the instrument enclosure and is exhausted back to the environment by a software controlled cooling fan. The instrument should be installed by a qualified electrician or service technician and is designed to be hard wired to an AC line to prevent tampering or weather related failure. It accepts a universal AC power input and all internal components are powered by a 24 Vdc supply.

Thermo Scientific™
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Sensor Specifications	CO	O_3	NO_2	SO_2	$PM_{2.5}$	PM_{10}
Range[1]	0-50 ppm	0-500 ppb	0-500 ppb	0-500 ppb	0-1500 ug/m3	0-1500 ug/m3
Detection Limit (5 minute averaging)	0.020 ppm	5 ppb	5 ppb	5 ppb	<1.0 ug/m3	<1.0 ug/m3
Span Repeatability[2]	2% (of value)	2% (of value)	2% (of value)	2% (of value)		
Accuracy / Linearity	2% (of full scale)	2% (of full scale)	2% (of full scale)	2% (of full scale)		
Zero Drift (24 Hours)	< 0.03 ppm	< 10 ppb	< 10 ppb	< 10 ppb		
Span Drift (24 Hours)	< 2% (of value)	< 5% (of value)	< 5% (of value)	< 5% (of value)		
Response Time (2 minute report period)	120 seconds	120 seconds	120 seconds	120 seconds		

Instrument Specifications	
Resolution	10 ppb gases
Concentration display updating interval	10 seconds
Data logging periods	1 minute to 1 hour (average value is reported)
Total number of records that can be logged in memory	> 500,000 (one years' worth of data)
Logged data	Record no., concentration, temperature, relative humidity, barometric pressure, data flags, time and date
Diagnostic data	Critical voltages, sensor temp., RH, ATM pressure
Readout display	Implemented through web browser
AC source	100-240 VAC 50-60 Hz
Optimal operating environment	-10 to 45°C (14 to 113°F), 15 to 90% RH, non-condensing
Storage environment	-20 to 70 °C (-4 to 158 °F)
Dimensions	16 in (406 mm) H x 12 in (305 mm) W x 6 in (152 mm) D
Weight	11 lbs. (5 kg)

All performance specifications are determined under controlled laboratory conditions

[1]Extended ranges avaialble on request

[2]All span measurements made at 80% of full scale

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