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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 and photoionization detector for gas measurement while providing unattended monitoring with continuous real-time data transmission to a central location and/or internal memory.

Features

- Configurable measurements for gas (NO_2, SO_2, O_3, CO, NO, t-VOC), 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 8 measurements available are NO_2, SO_2, O_3, CO, NO, t-VOC, PM2.5 and PM10 and can be configured for different customer applications.

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 with option to be connected with external battery and all internal components are powered by a 24 volts DC supply.

Thermo Scientific™
GM-5000 Air Quality Monitor

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Sensor Specifications	CO	O_3	NO_2	SO_2	$PM_{2.5}$	PM_{10}	t-VOC	NO
Range[1]	0-50 ppm	0-500 ppb	0-500 ppb	0-500 ppb	0-1500 ug/m3	0-1500 ug/m3	0-40ppm	0-500 ppb
Detection Limit (5min averaging)	0.020 ppm	5 ppb	5 ppb	5 ppb	<1.0 ug/m3	<1.0 ug/m3	5 ppb	5 ppb
Span Repeatability[2]	2% (of value)	2% (of value)	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)			2% (of full scale)	2% (of full scale)
Zero Drift (24 Hours)	< 0.03 ppm	< 10 ppb	< 10 ppb	< 10 ppb			< 10 ppb	< 10 ppb
Span Drift (24 Hours)	< 2% (of value)	< 5% (of value)	< 5% (of value)	< 5% (of value)			< 5% (of value)	< 5% (of value)
Response Time (1min report period)	120 seconds	120 seconds	120 seconds	120 seconds			120 seconds	120 seconds

Instrument Specifications	
Display Resolution	NO_2, SO_2, O_3, NO, t-VOC≤ 0.1ppb; CO≤0.01ppm; PM2.5, PM10≤1 ug/m3
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 50°C (14 to 122°F), 15 to 90% RH, non-condensing (except for NO_2 and O_3 sensor with maximum temperature at 45°C)
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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