

Automated ambient particulate measurement utilizing beta attenuation

The Thermo Scientific™ Model 5014*i* Beta Continuous Particulate Montior uses beta attenuation technology in combination with the established iSeries platform design.

Introduction

A known volume of air is drawn through a size-selective inlet, which can be confi gured to measure PM-10, PM-2.5, PM-1 or TSP, and deposited onto the auto-advancing filter tape. The combined measurement of mass and air volume are used to obtain the mass concentration readings. Supplied with user-selectable data logging options, concentrations can be reported in actual or standard conditions.

The Model 5014*i* monitor auto-advances the particulate-laden sample filter in accordance with user-defined parameters such as mass accumulation limits, timed intervals or the continuous flow rate relative to pressure changes.

The filter tape will advance in a continuous pattern, as compared to stepwise measurement, resulting in the mitigation of particle losses. In addition, the filter tape will advance if the sample exceeds maximum loading criteria.

Features

- · Flash memory for increased data storage
- Enhanced ethernet connectivity
- Remote data access
- U.S. EPA Approved PM-10 (EQPM1102-150) and PM-2.5 (EQPM0609-183) equivalent monitor
- Continuous, non-stepwise measurement
- Volatile loss mitigation via Dynamic Heating System
- Long term, unattended operation
- · Low detection limit, high accuracy and resolution
- Enhanced user interface and iPort communication software

Thermo Scientific Model 5014i Beta Continuous Particulate Monitor

Measurement range 0 to 1.0, 2.0, 3.0, 5.0, 10.0 mg/m³; 0 to 100, 1,000, 2,000, 3,000, 5,000, 10,000 μg/m³ Minimum detection limit 6 μg/m³ (1/2 hour), 4 μg/m³ (1hour); 3 μg/m³ (3 hour), 1 μg/m³ (24-hour Resolution 0.1 μg/m³ Precision ±2.0 μg/m³ < 80 μg/m³, 4-5 μg/m³ > 80 μg/m³ (24-hour average) Accuracy (for mass measurement) ±5% using NIST-traceable mass foil set 1m³/h (16.67 L/min) measured across an internal subsonic orifice Sample flow precision ±2% of measured value Sample flow accuracy < 5% of measured value Sample flow accuracy < 5% of measured value Mass concentration Data output rate Every 1 second The temperature of sampled air may vary -30° to 50° C. 5014 <i>i</i> must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Non-condensing < 95% RH inside 5014 <i>i</i> Monitor RS232/RS485, TCP/IP, 10 status relays and power fail indication (standard), 6 user defined analog outputs (0-100 mV, 0-1, 0-5 or 0-10 Vdc), Six 0-20 or 4-20 mA isolated current output (optional) 10 Digital inputs (standard), eight 0 to 10 Vdc analog inputs (optional), 8 user-defined analog; outputs (0-1 or 0-5 Vdc) Power requirements Power requirements 100 − 240 VAC, 50-60 Hz recommended; 805 watts (115V); 880 watts (220-240V) watts maximum (instrument, heater & pump) 120 VAC/60 Hz: 4.25A; 240 VAC/50Hz: 2.25A Physical dimensions Meight 40 lbs. (19kg) C-Link, MODBUS TCP/IP, Gesytec (Bayern-Hessen), ESM protocol, streaming data and NTP (Network Time Protocol) protocols. Simultaneous connections from different locations over Ethernet Designed to meet CE: RN61326:1997 + A1:1998 + A2:2001 + A3:2003 EN6101-1 UL: 61010-1:2004; CSA: C22.2 No. 61010-1:2004; FCC: Part 15 Subpart B, Class B Approvals and Certifications U.S. EPA PM-10 equivalent monitor: EQPM1102-150; U.S. EPA PM-2.5 equivalent monitor: EQPM0609-183, UKCA	Specifications	
Minimum detection limit 6 μg/m³ (1/2 hour), 4 μg/m³ (1hour); 3 μg/m³ (3 hour), 1 μg/m³ (24-hour Resolution 0.1 μg/m³ Precision ±2.0 μg/m³ < 80 μg/m³, 4-5 μg/m³ > 80 μg/m³ (24-hour average) Accuracy (for mass measurement) Air flow rate 1m³/h (16.67 L/min) measured across an internal subsonic orifice Sample flow precision ±2% of measured value Sample flow accuracy 45% of measured value Mass concentration Data output rate Every 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Non-condensing 85232/RS485, TCP/IP, 10 status relays and power fail indication (standard), 6 user defined analog outputs (0-100 mV, 0-1, 0-5 or 0-10 Vdo), Six 0-20 or 4-20 mA isolated current output (optional) B user-defined analog; outputs (0-1 or 0-5 Vdo) Power requirements 100 - 240 VAC, 50-60 Hz recommended; 805 watts (115V); 880 watts (220-240V) watts maximum (instrument, heater & pump) Pump 120 VAC/60 Hz: 4,25A; 240 VAC/50Hz: 2.25A 16.75° (42.5cm) W 23° (58.4cm) D x 8.62 (21.9cm) H; 19" rack mountable with optional ears and handles Weight C-Link, MODBUS TCP/IP, Gesytec (Bayern-Hessen), ESM protocol, streaming data and NTP (Network Time Protocol) protocols. Simultaneous connections from different locations over Ethernet Designed to meet CE: ENGlascing 97 + A1:1998 + A2:2001 + A3:2003 ENGlobal Cartifications 9 Approvals and Certifications Cequivalent monitor: EQPM0609-183, UKCA	Source	Carbon-14 (C-14), < 3.7 MBq (< 100 μCi)
Resolution 0.1 μg/m³ Precision ±2.0 μg/m³ < 80 μg/m³, 4-5 μg/m³ > 80 μg/m³ (24-hour average) Accuracy (for mass measurement) Air flow rate 1m³/h (16.67 L/min) measured across an internal subsonic orifice Sample flow precision ±2% of measured value Sample flow accuracy <5% of measured value Mass concentration 60 to 3,600 seconds and 24-hour Data output rate Every 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Very 1 second Non-condensing Very 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Very 1 second Non-condensing Very 2 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Very 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Very 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Very 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Very 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Very 1 second The temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Very 1 second The temperature of sampled air may vary -30° to 50° C. An optional value and power fail indication of complete value	Measurement range	
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Accuracy (for mass measurement) Air flow rate Im³/h (16.67 L/min) measured across an internal subsonic orifice Sample flow precision \$2% of measured value Sample flow accuracy Accuracy Accuracy Accuracy Accuracy Im³/h (16.67 L/min) measured across an internal subsonic orifice \$2% of measured value Accuracy Accuracy Accuracy Accuracy Im³/h (16.67 L/min) measured across an internal subsonic orifice \$2% of measured value Accuracy Accuracy Accuracy Im³/h (16.67 L/min) measured across an internal subsonic orifice \$2% of measured value Accuracy Accuracy Accuracy Im³/h (16.67 L/min) measured across an internal subsonic orifice \$2% of measured value Accuracy Accuracy Im³/h (16.67 L/min) measured across an internal subsonic orifice \$2% of measured value Accuracy Im²/h (16.67 L/min) measured across an internal subsonic orifice \$2% of measured value Accuracy Im²/h (16.67 L/min) measured across an internal subsonic orifice ### Accuracy ### Ac	Resolution	0.1 μg/m³
(for mass measurement) Air flow rate Air flow rate Im³/h (16.67 L/min) measured across an internal subsonic orifice \$ample flow precision \$\frac{\pmass}{2}\% of measured value}\$ \$\frac{\pmass}{2}\% of measured value}\$ Air flow accuracy \$\frac{\pmass}{2}\% of measured value}\$ Air to the temperature of sampled air may vary -30° to 50° C. 5014/ must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Non-condensing \$\frac{\pmass}{2}\% RH inside 5014/ Monitor\$ \$\frac{\pmass}{2}\% RS232/RS485, TCP/IP, 10 status relays and power fail indication (standard), 6 user defined analog outputs (0-100 mV, 0-1, 0-5 or 0-10 Vdc), Six 0-20 or 4-20 mA isolated current output (optional) a user-defined analog; outputs (0-1 or 0-5 Vdc) \$\frac{\pmass}{2}\% RS460 + RT (20-20 MA) (20-40	Precision	$\pm 2.0 \ \mu g/m^3 < 80 \ \mu g/m^3, \ 4-5 \ \mu g/m^3 > 80 \ \mu g/m^3 \ (24-hour average)$
Sample flow precision ±2% of measured value Sample flow accuracy < 5% of measured value Mass concentration 60 to 3,600 seconds and 24-hour Data output rate Every 1 second The temperature of sampled air may vary -30° to 50° C. 5014i must be weather protected within range 0° to 50° C. An optional Complete Outdoor Enclosure provides complete weather protection. Non-condensing < 95% RH inside 5014i Monitor RS232/RS485, TCP/IP, 10 status relays and power fail indication (standard). 6 user defined analog outputs (0-100 mV, 0-1, 0-5 or 0-10 Vdc), Six 0-20 or 4-20 mA isolated current output (optional) Input 16 Digital inputs (standard), eight 0 to 10 Vdc analog inputs (optional), 8 user-defined analog; outputs (0-1 or 0-5 Vdc) Power requirements (220-240V) watts maximum (instrument, heater & pump) Pump 120 VAC/60 Hz: 4.25A; 240 VAC/50Hz: 2.25A Physical dimensions (19kg) C-Link, MODBUS TCP/IP, Gesytec (Bayern-Hessen), ESM protocol, streaming data and NTP (Network Time Protocol) protocols. Simultaneous connections from different locations over Ethernet Designed to meet CE: EN61326:1997 + A1:1998 + A2:2001 + A3:2003 EN61010-1 UL: 61010-1:2004; CSA: C22.2 No. 61010-1:2004; FCC: Part 15 Subpart B, Class B Approvals and Certifications (200 A)	Accuracy (for mass measurement)	± 5% using NIST-traceable mass foil set
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Safety and electrical EN61010-1 UL: 61010-1:2004; CSA: C22.2 No. 61010-1:2004; FCC: Part 15 Subpart B, Class B Approvals and U.S. EPA PM-10 equivalent monitor: EQPM1102-150; U.S. EPA PM-2.5 certifications equivalent monitor: EQPM0609-183, UKCA	Protocols	streaming data and NTP (Network Time Protocol) protocols.
certifications equivalent monitor: EQPM0609-183, UKCA	Safety and electrical	
Country of origin India	Approvals and certifications	U.S. EPA PM-10 equivalent monitor: EQPM1102-150; U.S. EPA PM-2.5 equivalent monitor: EQPM0609-183, UKCA
	Country of origin	India

To maintain optimal product performance, you need immediate access to experts worldwide, as well as priority status when your air quality equipment needs repair or replacement. We offer comprehensive, flexible support solutions for all phases of the product life cycle. Through predictable, fixed-cost pricing, our services help protect the return on investment and total cost of ownership of your Thermo Fisher Scientific products.

Your order code: 5014i Beta Continuous Particulate Monitor



Ordering information

Model 5014i Beta

Choose the following configurations options to customize your own Model 5014*i* Beta

Voltage options

A = 120 VAC 50/60 Hz (standard)

B = 220 VAC 50/60 Hz

C = 100 VAC 50/60 Hz

D = 220 VAC 50/60 Hz (China)

Tube options

H= Extended tube assembly (6') includes SS tube union and tefl on ferrule

N = No extended tube assembly

T = Tripod

B= Tripod & extended tube assembly (6') includes SS tube union and tefl on ferrule

Inlet options

C = TSP with bug screen

E = PM-10 US EPA

T = PM-10 traditional

S = SCC inlet combo (PM-10 US EPA, 1st stage w/PM-2.5 SCC)

U = SCC inlet combo (PM-10 traditional, 1st stage w/PM-2.5 SCC)

V = VSCC inlet combo (PM-10 US EPA, 1st stage w/ PM-2.5 VSCC)

W = VSCC inlet combo (PM-10 traditional, 1st stage w/ PM-2.5 VSCC)

P = TE inlet combo PM-10 US EPA 1st stage w/TE 2.5C US EPA

 $\rm Q = TE$ inlet combo PM-10 traditional 1st stage w/TE 2.5C US EPA

 ${\rm X^*}={\rm Thermo}$ Fisher inlet combo PM-10 US EPA 1st stage w/PM-2.5 TF

 Y^* = Thermo Fisher inlet combo PM-10 traditional 1st stage w/PM-2.5 TF

1 = SCC inlet combo (PM-10 US EPA, 1st stage w/ PM-1 SCC)

2 = SCC inlet Combo (PM-10 traditional, 1st stage w/ PM-1 SCC)

3 = PM-10 inlet (EU-style DPM10/01/00), 1 m³/h

4 = PM-2.5 inlet (EU-style DPM 25/01/00), 1 $\text{m}^{\text{3}}/\text{h}$

N = No inlet

Options

A = None (standard)

C = I/0 Expansion board (4-20 mA outputs, 6 channels, 0-10 V inputs, 8 channels)

Mounting hardware

A = Bench mounting and Ears/Handles, EIA

Included

Heated sample tube (1m)

Sample pump (universal)

*X and Y are not US EPA approved and hence recommended for research use only.



Learn more at thermofisher.com/cleanair

