

To Sense Breaks or Tears in Filter Bags, to Improve Product Quality,
and to Eliminate related Environmental and Safety Risks

Triboelectric Dust Monitor

PFM Series



Excellent Sensor to Protect Life and the Environment

Particles in the air are a concern for the production lines of each and every industry. Leakage and mixing of particles such as dust are serious concerns for environmental quality, traceability of products, and improvements in productivity. Since dust deposits have been recently recognized as a safety issue, the timely detection of leaks and the continuous monitoring of dust concentrations are crucial. The Matsushima PFM dust monitors can be used to measure the concentration of dust and other air particles under various conditions.

High Performance

Produces the same high performance as optical systems at lower cost.

- Nine monitoring levels of dust concentration.
- Detects solid particles with diameters from 0.3 μm to 100 μm .
- Provides level alarm signal (1C with compact type, 2C with remote type) as well as fault alarm signal (1C).
- Requires no additional equipment such as an air purge and cooling system (Max process temperature: 250°C)
- For high-pressure applications up to 200 kPa.

Easy to use

**Requires no special training or skills.
Easy to install and to adjust.**

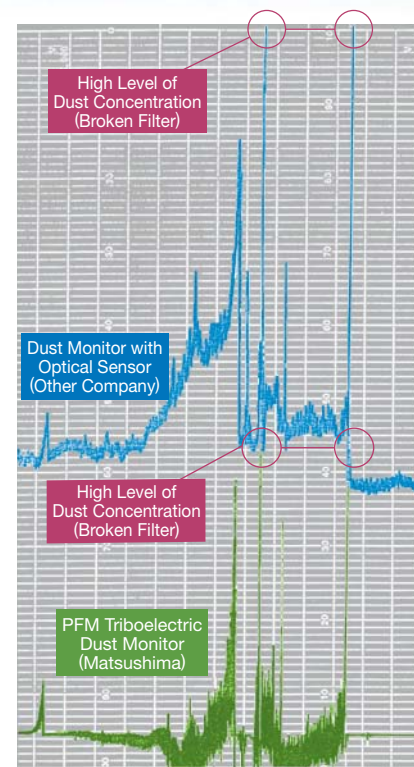
- Simply use the switches to select the monitoring level of dust concentration and to adjust the sensitivity.
- Easily adjust concentration monitoring levels with a digital display for viewing (standard).
- Two styles are available: a sensor with an integrated transducer or a non-integrated type.
- Changeable probe length from 300 mm to 1000 mm. (Can be extended to 1000 mm for special orders.)

* : Measurement range, integration time, and contact output can be adjusted.

Easy Maintenance

All components are made in Japan for ensured high quality and excellent customer service.

- Requires only periodic cleaning of the probe for maintenance. (Approximately every three months under normal operation conditions.)
- Uses advanced digital technology for high quality and reliability.
- Speedy and accurate service including calibration support.
- Easy replacement of damaged probes.

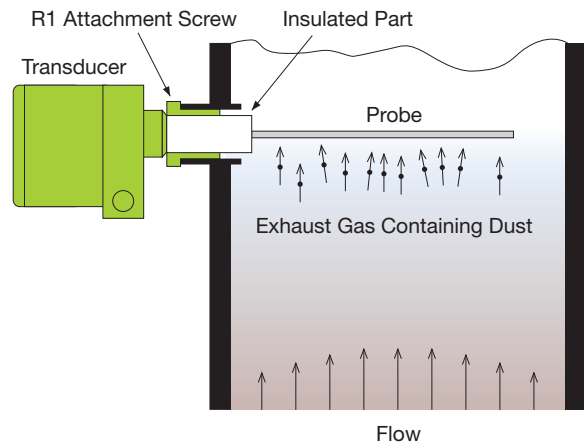


▲ Comparison of Dust Concentration Levels

The Matsushima PFM dust monitor can measure the dust concentration as accurately as a high-cost optical sensor under the same conditions.

Operation Principles

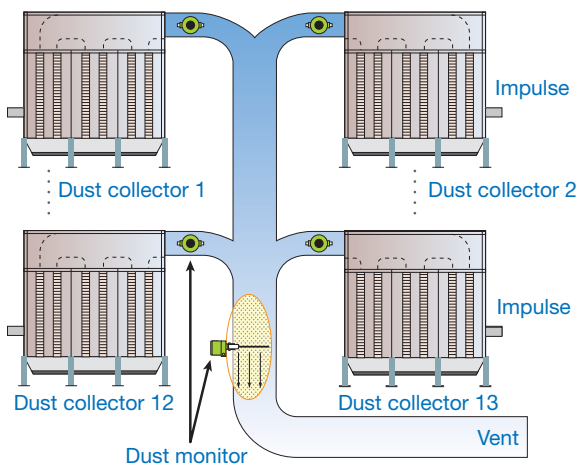
When solid particles such as dust in gas emissions come into contact or pass through the triboelectric probe, a charge transfer is produced in the probe. The charge is converted to a current signal, and a measurement signal ranging from 4 mA to 20 mA DC in proportion to the amount of particles is output.



Applications for Dust-collecting Equipment and Others

Possible to monitor multiple dust collectors

It is possible to monitor multiple dust collectors by utilizing timing of periodical backwashing impulse.



Cement Factories

- For coal ash and other raw materials.
- For cement and concrete products.
- For kilns, AQC (Air-quality Control) systems, and other equipment.
- For slug- and fly ash.

Ironworks

- For steel sintering.
- For casting.
- For coke ovens.
- For recycling-related facilities such as those for waste disposal of plastics.

Chemical Factories

- For catalyzation.
- For smoke removal.

Automobile Factories

- For casting.

Waste incineration Plants

- For monitoring the environment.
- For incinerators.
- For fusion furnaces.
- For high-temperature incinerators used to cut emissions such as dioxins.

Rubber and Carbon Factories

- For monitoring of dust accumulation in ducts.
- For handling raw materials.

Fertilizer Plants

- For preventing mixture of fertilizers.

Spice and Paint Factories

- For traceability-related equipment.

Gas Extraction Equipment for Boilers

- For generators.

Other Dust-collecting Equipment

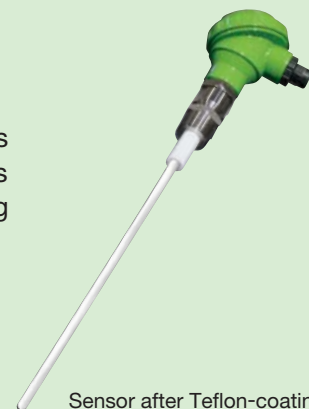
Optional probe

Teflon-coated probe

Dramatically improved anti-corrosion performance

Life of the probe can be extended dramatically with this teflon-coated probe even in emission of corrosive gas (chlorine, sulfurous, nitric acid, and others). Teflon coating is also effective for reducing dust adhesion.




Item	Details
Range of coating	Probe (part exposed to gases)
Coating material	Conductive Teflon
Coating thickness	40 μm



Sensor after Teflon-coating

Specifications




● Sensor

Sensor Type		Sensor with Integrated Transducer	Remote Type Sensor	
		Standard	Standard	High-temperature Applications
Model Number		PFM-M01E	PFM-M11P	PFM-M11PT
				
Construction		Sensor with integrated transducer	Sensor and transducer are separately installed.	
Approx. Mass		2.1 kg	1.3 kg	2.1 kg
Power Supply		80 to 240 VAC 50/60 Hz	From transducer	
Power Consumption		4 VA	—	
Dedicated Signal Cable Length		—	5 m (standard). Can be extended to 100 m for special orders.	
Concentration Level Display		10-segment LED (Lights up at every change of 10%)	—	
Contact Output		One contacts for upper limit alarm, one contact for fault alarm. (Contact capacity: 250 VAC, 2 A)	From transducer	
Target	Particle Size	0.3 μm min.		
	Particle Concentration	0 to 1000 mg/m ³ (Reference concentration)		
Process	Process Temperature	250°C max.	400°C max.	
	Ambient Temperature	-20 to +65°C (Without condensation)		
	Gas Flow Velocity	4 m/s min. (Constant velocity)		
	Humidity	40% max.		
	Pressure	200 kPa max.		
Equipment	Analog Output	4 mA to 20 mA DC (Load resistance: 500Ω)	From transducer	
	Measurement Range	9 levels	Use transducer to make settings	
	Data Averaging	Time setting up to 30 seconds* ¹	Use transducer to make settings	
	Probe Length	300 to 1000 mm* ²		
	Enclosure	Protection rating: IP65		
	Mounting	R1 screw with one-inch socket		

* 1 : Transducer Integrated type adjustable in 3sec step.

* 2 : If the insulation is 58mm.

● Transducer for Remote type

Transducer Type		Standard	With Concentration-level Correction	
Model Number		PFM-KCU11	PFM-KCU12	PFM-KCU14
				
Approx. Mass		0.7 kg		
Power Supply		110 VAC or 220 VAC, -15 to +10%, 50/60 Hz*		
Power Consumption		7 VA		
Concentration Level Display		4 digit 7 seg LED		
Unit of measurement		%		mg/m ³
Contact Output		Two contacts for upper limit alarm, one contact for fault alarm. (Contact capacity: 250 VAC, 2 A)		
Correction Range		—	0.1 to 2.0 times (at 0.1 intervals)	
Equipment	Analog Output	4 mA to 20 mA DC (Load resistance: 500Ω)		
	Measurement Range	9 levels		
	Data Averaging	Time setting up to 30 seconds		
	Mounting	Wall or DIN rail mounting		

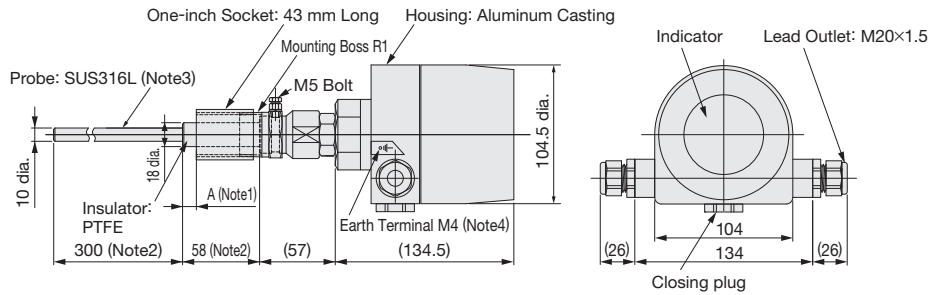
* : Specify the power voltage when you order.

●Dimensions (mm)

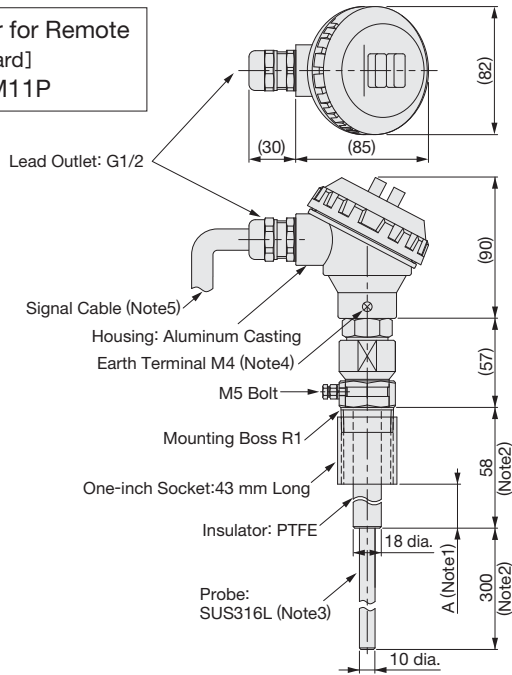
Sensor with Integrated Transducer [Standard] PFM-M01E

Wiring

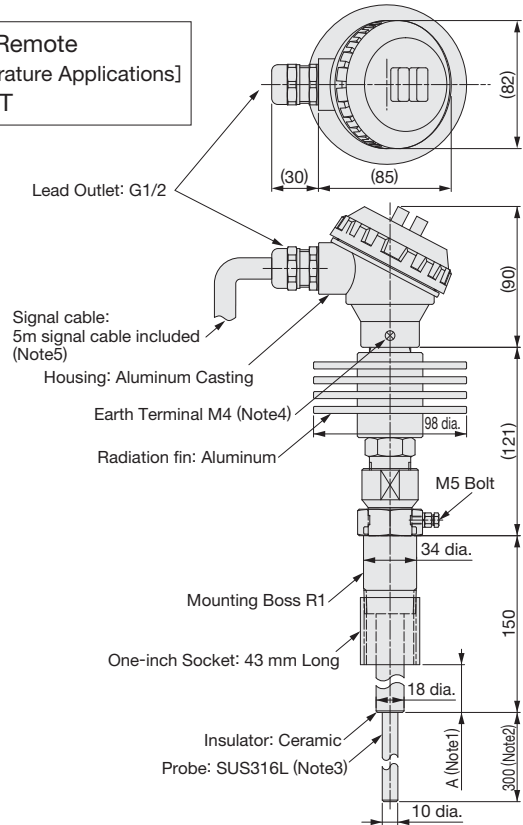
AC	AC	NC	COM	NO	COM	-	+	
L Power Supply	L Alarm Output	L Contact Output	4 to 20 mA DC Output					



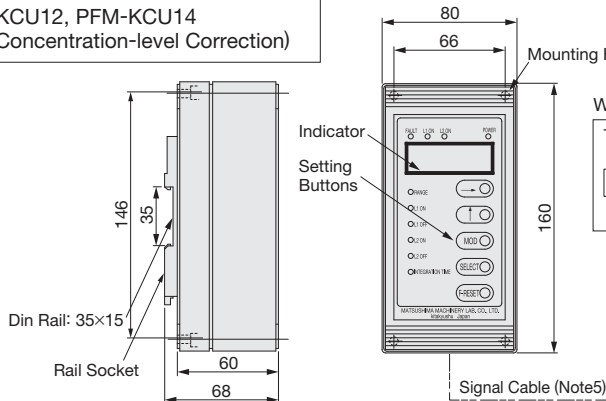
Sensor for Remote [Standard] PFM-M11P



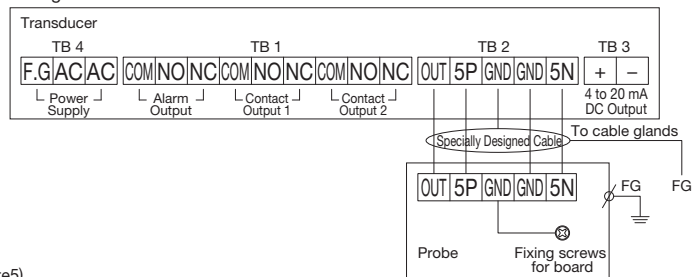
Sensor for Remote [High-temperature Applications] PFM-M11PT



Transducer for Remote type PFM-KCU11(Standard) PFM-KCU12, PFM-KCU14 (With Concentration-level Correction)



Wiring



Notes:

1. The minimum space (A) between the socket and the insulator must be 10 mm.
2. The length of Insulator and Probe can be changed at option.
3. Do not touch the probe with bare hands.
4. Be sure to ground the ground terminal.
5. Use a shielded cable for the signal cable.

Specifications are subject to change without notice.

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Caution

- Read the instructions to ensure correct and suitable application of products.
- Contact our nearest sales office when using our products for any systems used in situations which may be life threatening.

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