

For filter bag breakage & dust leak detection, productivity improvement, environmental measures and disaster risk reduction.

Triboelectric Dust Monitor

PFM Series



Triboelectric Dust Monitor PFM Series

Detect and Monitor invisible dust



- Immediately detect abnormal dust leakage and so possible to minimize the environmental damage.
- Predictive maintenance possible by the continuous monitoring of filter bag damage degree.
- Possible to detect minute amount of dust leakage which cannot be detected with D/P transmitter.

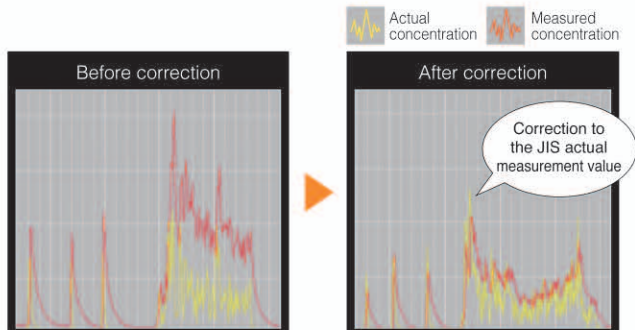
1 Application flexibility based on wide variety of experiences

Concentration-level correction type

Complied with JIS Z8852 (ISO-10155 MOD) *

Possible to get approximation (by inputting a coefficient value from 0.1 to 2.0 of concentration-level correction) to actual dust concentration based on the JIS standard absolute measurement. Reliable but low cost against Optical measurement or JIS absolute measurement method.

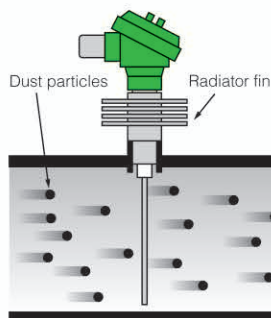
* Triboelectric principle is complied with JIS Z8852 which is published as related standard of JIS Z8808.



High temperature type

Applicable to process temp. Max.400degC

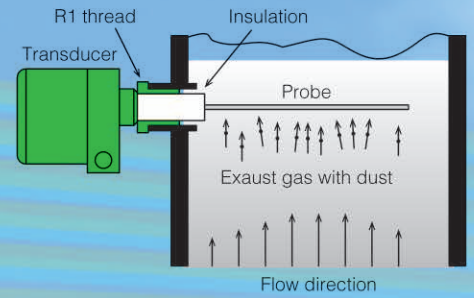
Applicable to process temp. Max.400degC with the radiator fin option. Possible to use for those harsh application of garbage incinerators, melting furnaces, etc.



Sensor for transducer remote type PFM-M11PT

Working principle

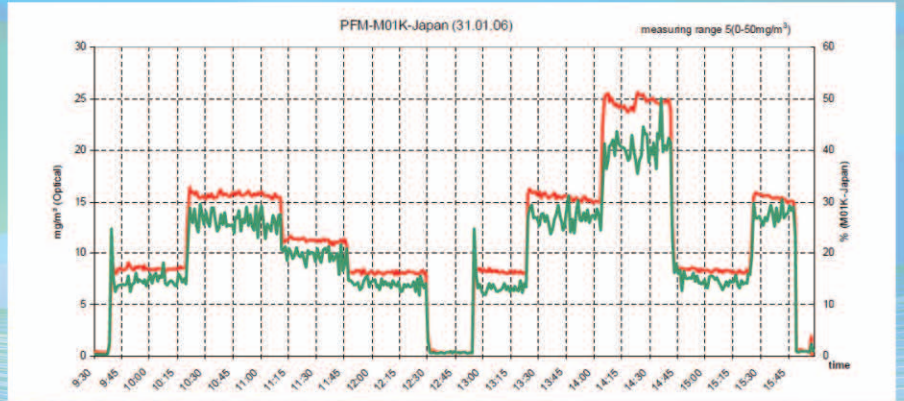
It generates electric charge movement (triboelectric) when dust (particles) in exhaust gas hits or passes by the detection probe of Dust Monitor. Dust Monitor converts the triboelectric amount into current analog signal and outputs DC4-20mA instrumentation signal in proportion to the dust amount.



Correlation data between Triboelectric Dust Monitor and Optical measurement.

Graph of the right shows correlation between Triboelectric Dust Monitor and the optical measurement which is here used as the evaluation standard.

█ : Optical measurement
█ : Triboelectric PFM series



Explosion proof type

Intrinsically safe construction (Ex ib IIB T4)

Applicable to hazardous area Zone 1 & 2. For example, it is possible to use as dust concentration monitoring equipment in hazardous area of power plants, oil & gas plants, chemical plants, etc.

(Notes) Not applicable to hazardous area Zone 0.

Safe area (remote equipment)



Zener barrier
Z961 / Z964



Transducer
PFM-KCU01

Intrinsically safe construction
PFM-M01PEX

PTFE coating type

Corrosion resistant performance drastically improved

Corrosion resistant performance and lifetime of the probe is drastically improved with the PTFE coating option, furthermore, effective to reduce dust adhesion.

Items	Specifications
Coating area	Probe (wetted part)
Coating material	Conductive PTFE
Coating thickness	40μm

Probe with PTFE coating
Option

Application references

Cement plant

- Raw material mill, Coal mill
- Cement product relating facilities
- Kiln, AQC
- Slag, Fly ash relating facilities

Iron & Steel

- Sinter plant
- BF casting floor dedusting facility
- Coke plant
- Waste plastic ECO relating facilities

Garbage incineration

- Environmental monitoring
- Incinerator dedusting facility
- Melting furnace dedusting facility
- High temp dioxin treatment facilities

Chemical plant

- Catalyst dedusting facilities
- Smoke extraction facilities

Rubber/Carbon factories

- Dust accumulation (in duct) monitoring
- Raw material relating facilities

Automotive

- Casting facilities

Fertilizer

- Mismixing prevention

Flavoring agent / Paiting material

- Traceability relating facilities

Boiler exhaust gas facilities

- Power generation facilities

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Stable supply & service support

Providing stable supply of high quality products with short delivery time as well as providing prompt and adequate service support.

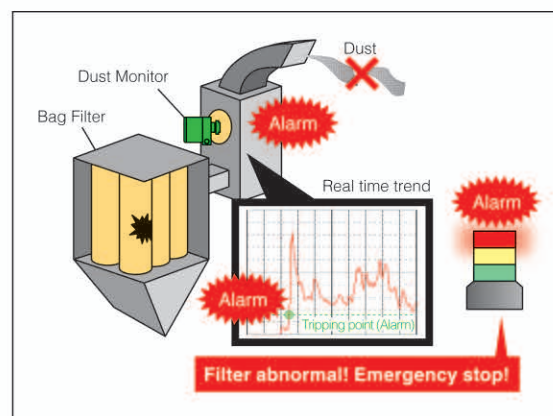


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Easy adjustment and customer friendly operation




Installation reference (on the right sketch) of Dust Monitor installed at the secondary side (exhaust side) of a Bag Filter for filter breakage detection to prevent dust spreading.

- Easy adjustment, Sensitivity range setting only, No special knowledge required.
- Easy maintenance, Easy mounting/dismounting, Less maintenance load.






Specifications

○ Sensor

Sensor Type	Sensor with Integrated Transducer		Remote Type Sensor	
	Standard		Standard	High-temperature Applications Explosion-Proof Type (Ex ib IIB T4)
Model Number	PFM-M01E		PFM-M11P	PFM-M11PT PFM-M01PEX
				
Construction	Sensor with integrated transducer		Sensor and transducer are separately installed.	
Approx. Mass	2.1kg		1.3kg	1.3kg 2.1kg
Power Supply	80 to 240VAC 50/60Hz		From transducer	
Power Consumption	4VA		—	
Dedicated Signal Cable Length	—		5m(standard). Can be extended to 100m for special orders.	
Concentration Level Display	10-segment LED (Lights up at every change of 10%)		On remote transducer From transducer	
Contact Output	1a for limit 1b for fault Contact capacity: 250VAC, 2A 30VDC, 2A		From transducer	
Analog Output	4mA to 20mA DC (Load resistance : 500Ω max)		From transducer	
Enclosure	Protection rating: IP65			Dust-proof & drip-proof *
Ambient Temperature	-20 to +65°C (Without condensation)			-20 to +60°C (Without condensation)
Measurement environment	Particle Size	0.3μm min.		
	Particle Concentration	0.1 to 1000mg/m ³ (Reference concentration)		
	Process Temperature	250°C max.	400°C max.	60°C max.
	Gas Flow Velocity	4m/s min. (Constant velocity)		
	Humidity	40% max.		
Equipment	Pressure	200kPa max.		
	Measurement Range	9 levels	Use transducer to make settings	
	Data Averaging	Time setting up to 30seconds	Use transducer to make settings	
	Probe Length	300 to 1000mm (When length of insulator is 58mm)		
	Mounting	R1 screw with one-inch socket		


* Housing cover and lead outlet must be closed.

○ Transducer for Remote type

Transducer Type		Standard	With Concentration-level Correction	
Model Number	Standard	PFM-KCU11	PFM-KCU12	PFM-KCU14
	Explosion-Proof Type	PFM-KCU01	PFM-KCU02	PFM-KCU04
				
Approx. Mass	0.7kg			
Power Supply	110VAC or 220VAC, -15 to +10%, 50/60Hz *			
Power Consumption	7VA			
Ambient Temperature	-20 to +50°C (Without condensation)			
Enclosure	Protection rating: IP20			
Concentration Level Display	4 digit 7 seg LED			
Unit of measurement	%		mg/m ³	
Contact Output	1cX2 for limit, 1c for fault (Contact capacity: 250VAC, 2A)			
Analog Output	4mA to 20mA DC (Load resistance: 500Ω max)			
Correction Range	—		0.1 to 2.0 times (at 0.1 intervals)	
Equipment	Measurement Range	9 levels		
	Data Averaging	Time setting up to 30seconds		
	Mounting	Wall or DIN rail mounting		

* Specify the power voltage when you order.

○ Zener Barrier

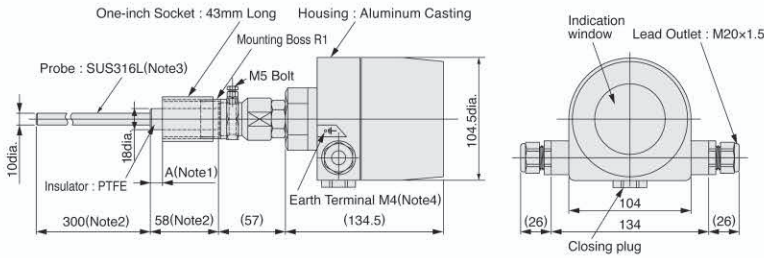
Model Number	Z961 / Z964
	
Explosion-proof enclosure	[Ex ia] IIB
Protection class	IP20
Ratings	U _o =17.4V I _o =190.3mA P _o =430mW U _m = 250VAC 50/60Hz 250VDC
Ambient Temperature	-20 to +60°C (Without condensation and freeze)
Ambient humidity	75% max.
Mass	150g

Note:

For a single detector, 2 zener barriers are the system configuration of explosion-proof intrinsic safety. Connecting the earth of the zener barrier to the DIN rail & connect the earth separately by A-class grounding.

Dimensions (mm)

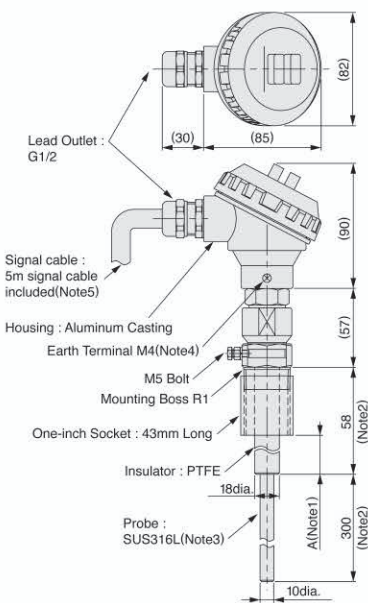
● Sensor with Integrated Transducer [Standard] PFM-M01E



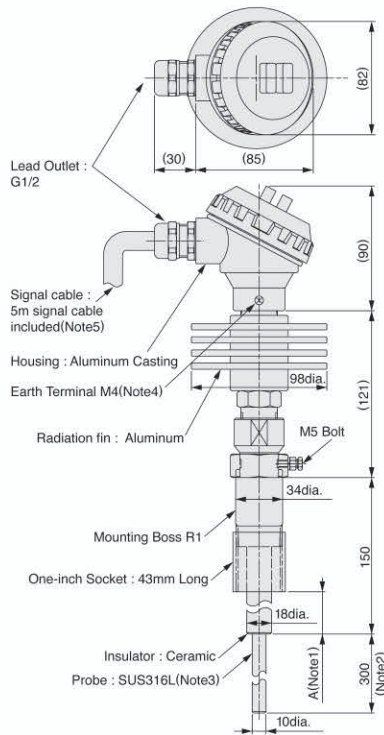
Wiring



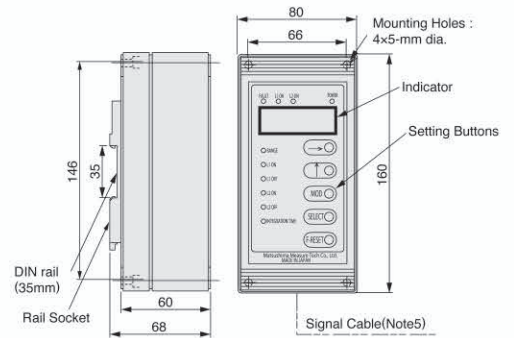
● Sensor for Remote [Standard / Explosion-Proof Type] PFM-M11P/M01PEX



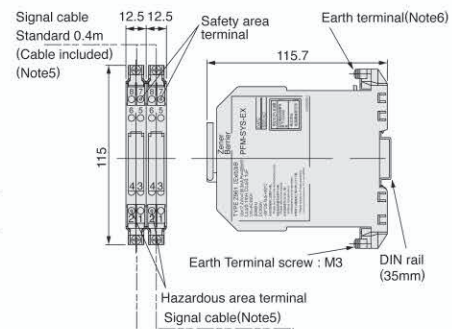
● Sensor for Remote [High-temperature Applications] PFM-M11PT



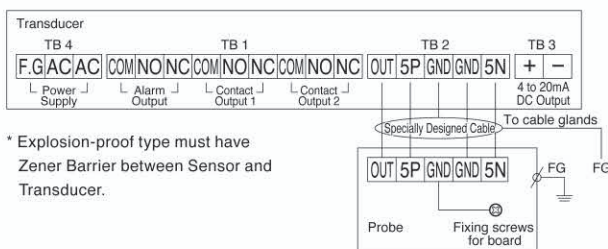
● Transducer for Remote type PFM-KCU□□



● Zener Barrier Z961 / Z964



Wiring(standard*)



Notes :

- The minimum space (A) between the socket and the insulator must be 10mm.
- The length of Insulator and Probe can be changed at option.
- Do not touch the probe with bare hands.
- Be sure to ground the terminal.
- Use a shielded cable for the signal cable.
- Please connect earth terminal separately.
A-class grounding(with the ground resistance of 10Ω or less)



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.

Distributor



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