



**EMP6**  
**Particulate Emission Monitor**

**Innovative Environmental Solutions**

**tyco** | Flow Control | **Environmental Systems**

## What it Does

- Continuously monitors for filter media leakage
- Indicates and transmits relative condition of bags
- Provides a 4-20mA and 0 – 10VDC output designed to feed a PLC or other display device
- Continuously monitors particulate flow, primarily emissions from process plants
- Can be calibrated for mg/m<sup>3</sup> (gr/ft<sup>3</sup>) or mg/s (gr/s) following calibration to Iso-kinetic sample
- Push button and remote input to enable zero and span checks.
- Built in data logging capability for redundancy.
- Acts as a preventative maintenance tool.

## Product Description

The EMP6 utilises AC Coupled Triboelectric technology. As particles travel through the process they develop a charge. This charge is transferred as the particle passes or impacts the sensing element. The resulting current is amplified, filtered, rectified and further filtered looking only at the AC component, to give a linear representation of the concentration or mass flow rate of the particles in the gas stream.

The reason for measuring the AC component is that compared to the DC component the electronics are more sensitive. The AC signal is substantially less affected by influences such as amplifier noise and process parameters, which includes the build-up of process dust on the sensing rod. The EMP6 remote sensing head totally filters out any 50Hz or 60Hz frequencies related to mains supply. The amplified signal is then sent via data cable to control unit for further processing and display.

## Operational Range

- Applicable for all types of outlet stack geometrical arrangements
- Insertion temperatures up to 200°C (392°F), higher if required
- Applicable to most particulate types
- For duct sizes from 50mm (2") to outlets over 10m (33ft).
- Dust concentrations from 0.01mg/m<sup>3</sup> (4x10<sup>-6</sup>gr/ft<sup>3</sup>)

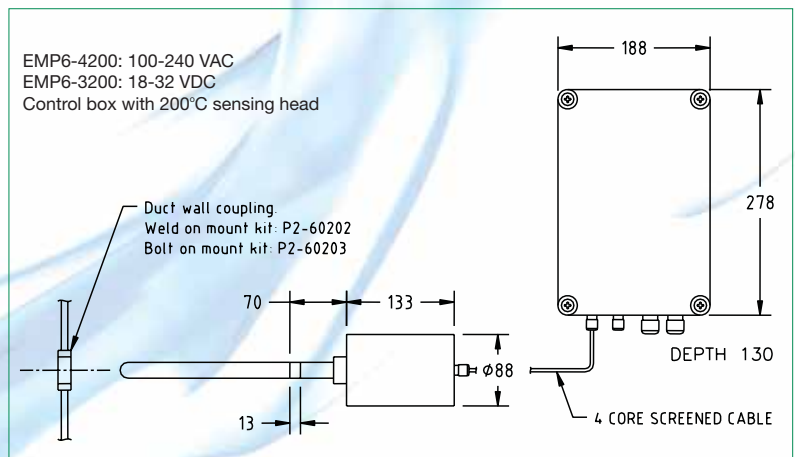
- Suitable for a wide range of dust collection, gas cleaning and stack emissions
- Suitable for most stack material, eg steel, brick etc.

## Benefits

- Detects most particles regardless of composition
- Very sensitive due to AC coupled technology
- Can monitor extremely small particles, eg galvanising fume (~0.1µm)
- Can be calibrated for large range of concentrations or mass flow rates 0.01mg/m<sup>3</sup> to 800mg/m<sup>3</sup> (4 x 10<sup>-6</sup>gr/ft<sup>3</sup> to 0.35gr/ft<sup>3</sup>)
- A seamless interface with industry standard PLC, data logger or SCADA
- Can dramatically reduce plant downtimes when interfaced into existing plant monitoring equipment.

## Features

- Proven AC Triboelectric technology
- Relay time delay feature
- Dual relay outputs
- SD card slot for data logging (ASCII comma delimited)
- Digital two way communication to ensure product integrity
- Sensitivity adjustment
- Air purge port (Option hazardous area, positively pressurized)
- Simple installation
- Alarm level adjustment.



## Modes of Operation

The EMP6 is a continuous monitoring device for particulate emissions in a gas stream. The instrument is applied in an uncalibrated indicative mode in which levels are displayed and recorded in a relative scale (0-100%) or as a 4-20mA scale which ensures that the signal output to PLC, SCADA system or data logger has the same value as that at the controller. The EMP6 gives a linear representation of either mg/m<sup>3</sup> or mg/s (gr/ft<sup>3</sup> or gr/s), when calibrated to gravimetric standards.

The EMP6 also has 2 relay modes – Normal and Failsafe.

### Normal

- The alarm relay is de-energised when the EMP6 is powered up.

### Failsafe

- The alarm relay is energised when the EMP6 is powered up.
- The alarm relay is de-energised when the EMP6 is in the alarm state.
- This mode is used to operate external alarm, indicating power failure.

### Historical Logging of Data

For improved preventative maintenance and compliance with some permit agreements, it may be necessary to have all historical information charted for future reference. The EMP6 carries an SD card slot for data logging and recording internally through ASCII comma delimited format. The system is user settable through the system port (adjustments include averaging time, sample rate).

## Technical Specification

### Functions

Bar graph:	Visual indication of emission density
Alarm time delay:	0-9 seconds in 1 second steps to prevent false alarms due to pulsing
Sensitivity:	Adjustable sensitivity within the sensing head (High, medium and low available)

### Outputs Particulate concentration or mass flow

Specification:	4-20mA (1K max) or 0-10V (10K min)
Function:	Full range of particulate level

### Alarm Relay

Specification:	8A Resistive/3.5A Inductive x2
Function:	High High/High Level Alarm, High/Low Level Alarm, Low Low/Low Level Alarm

### Control Unit

Enclosure rating:	IP66/Nema 4, ATEX III 3 D&G
Enclosure size:	280mm x 190mm x 130mm (254mm x 164mm Mounting)
Enclosure material:	Plastic Composite
Power supply:	100-240VAC 50/60Hz or 18-32VDC
Bargraph display:	20 step LED
Temperature range:	-20°C to 60°C (-4°F to 140°F)
Sensing head:	One per control unit

### Sensing Head

Insertion temperature range:	P2-45220: -20°C to 200°C (-4°F to 392°F)
Connection required on duct:	1" BSPT socket
Enclosure temperature range:	-20°C to 60°C (-4°F to 140°F)
Enclosure rating:	IP66/NEMA4, ATEX II 3 D&G (other hazardous areas as option)
Enclosure material:	Aluminium
Sensing element material:	316 Stainless Steel
Sensing element options:	Solid rod, tubular, teflon coated, multiple supports, cable type, different lengths available
Air Purge Requirements:	Connection: 1/8" gas thread on side of unit Air Pressure: 400kPa (60psi) Max Air Consumption: 1.7-17m <sup>3</sup> /hr (1-10cfm) pulsed

Electrical Specification between Sensing Head and Control Unit:	4 core screened data cables: Beldon 9534 (or equivalent) max 100m (330ft)
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