



**EMP5**  
Particulate Emission  
Monitor

## What it Does

- A total process data acquisition system.
- Continuously quantitatively and instantaneously records and reports process conditions.
- Continuously monitors and records particulate as well as any analogue signal such as temperature, pressure, associated with a process.
- Can have up to 8 different traces in each of 8 different trends on screen at any one time showing different parameters eg. concentration, mass flow, pressure, velocity, temperature.
- Extensive internal function library including; alarms, DDE (Dynamic Data Exchange), historical logging, trend charting, averaging.

## Product Description

The EMP5 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.

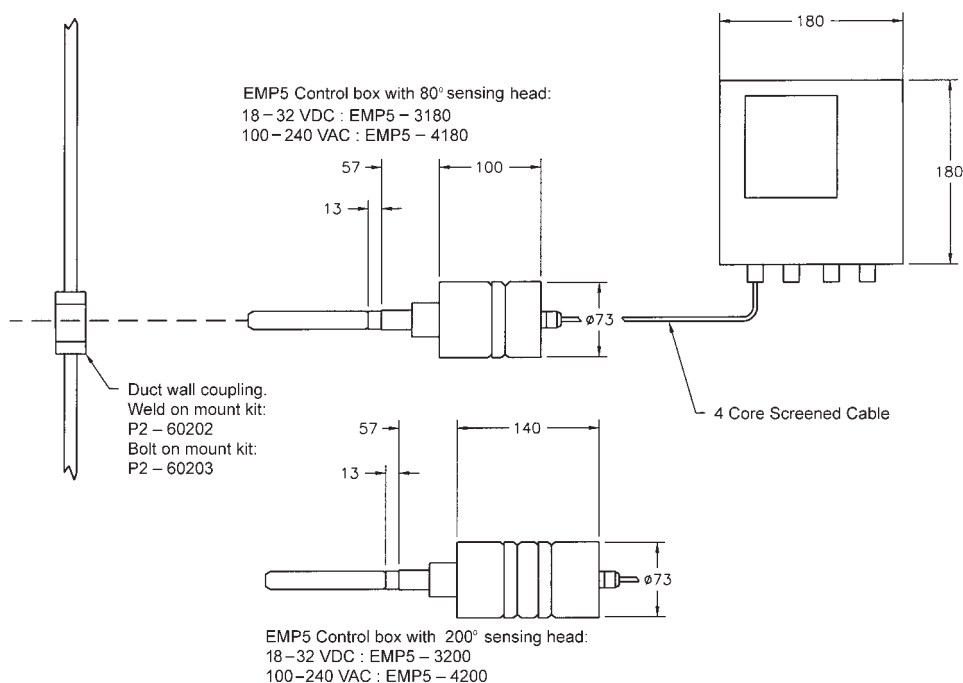
The EMP5 remote sensing head totally filters out any 50Hz or 60Hz frequencies related to mains supply. The amplified signal is then sent via data cable to control unit for further processing and display.

## Operational Range

- Suitable for a wide range of dust collection, gas cleaning and stack emissions.
- Applicable for all types of outlet stack geometrical arrangements.
- Insertion temperatures up to 800°C or 2000°C (1760°F or 3920°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> (4 x 10<sup>-6</sup>gr/ft<sup>3</sup>).
- Suitable for most stack material. eg. steel, brick etc.
- Optional intrinsically safe barrier.

## 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.
- Sensitivity adjustment.
- Air purge port.
- Potted construction for reliability and operational stability.
- Simple installation.
- Alarm level adjustment.

## Modes of Operation

The EMP5 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 EMP5 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 EMP5 also has 2 relay modes – Normal and Failsafe.

### Normal

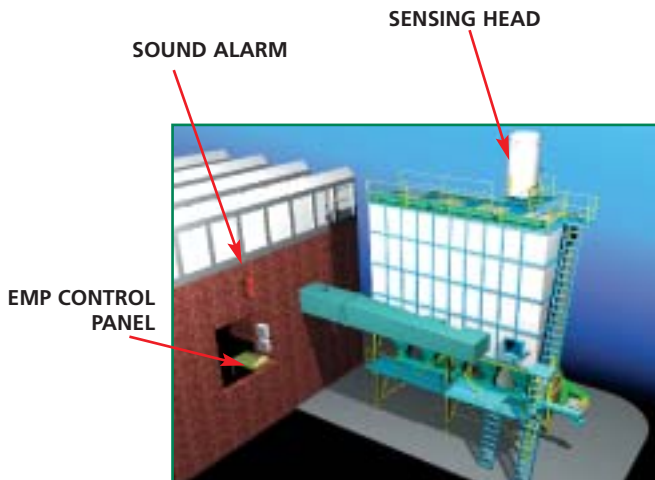
- The alarm relay is de-energised when the EMP5 is powered up.

### Failsafe

- The alarm relay is energised when the EMP5 is powered up.
- The alarm relay is de-energised when the EMP5 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. By interfacing the EMP5 with other Goyen hardware, software or third party industry standard equipment/software, continuous particulate level accuracy can be monitored and reported.



## Technical Specifications

### Functions

Bar Graph:	Visual indication of emission density
Alarm Time Delay:	0-18 seconds in 2 second steps to prevent false alarms due to pulsing
Sensitivity:	Coarse: Adjustable sensitivity (10 position switch) Fine: Allows fine tuning in between coarse steps

### Outputs

#### Particulate concentration or mass flow

Specification:	4-20mA (470 max) or 0-10V (10K min)
Function:	Full range of particulate level

#### Alarm Relay

Specification:	8A Resistive/1A Inductive
Function:	High Level Alarm

#### Control Unit

Enclosure Rating:	IP66/NEMA4
Enclosure Size:	180mm wide x 180mm high x 90mm deep (7 <sup>1</sup> / <sub>8</sub> " x 7 <sup>1</sup> / <sub>8</sub> " x 3 <sup>1</sup> / <sub>2</sub> " )
Enclosure Material:	Plastic Composite
Power Supply:	100-240VAC or 18-32VDC
Bargraph Display:	20 step LED
Temperature Range:	-200°C to 600°C (-40°F to 1400°F)

Sensing Head:	One per control unit
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#### Sensing Head

Insertion Temp Range:	P2-45210: -200°C to 800°C (-40°F to 1760°F) P2-45220: -200°C to 2000°C (-40°F to 3920°F)
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Connection required on duct:	1" BSPT socket
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Enclosure Temperature Range:	200°C to 600°C (-40°F to 1400°F)
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Enclosure Rating:	IP66/NEMA4
Enclosure Material:	Aluminium

Sensing Element Material:	316 Stainless Steel
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Sensing Element Options:	Solid rod, tubular, teflon coated, multiple supports, cable type, different lengths available
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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
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Electrical Specification between Sensing Head and Control Unit:	4 core screened data cables: Beldon 9534 (or equivalent) max 200m (660ft)
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