

# Drexel® Electronics and Engineering Products Private Limited

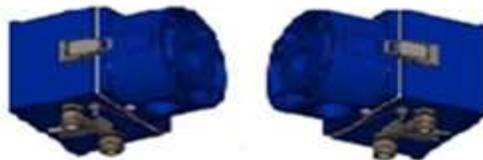
## PARTICULATE MATTER/DUST MONITORING



MONITORING SYSTEM



TRIBOELECTRIC



DUST  
OPACITY



LASER  
SCATTERING

## MEASUREMENT TECHNIQUES FOR PARTICULATE MATTER

To monitor the Particulate Matter in the Continuous Emission Monitoring System, Drexel follows the 3 types of Method specified in CPCB Guidelines in Table 4:

- Triboelectric Method (Non-Optical) method (Model:DX4P-PM)
- Dust Opacity Method.(Model:DX4P-PM(OP))
- Laser Scattering Method (Model : DX4P-PM(LS))

### APPLICATIONS:

The Main Industries where PM monitoring System uses are:

• Textile Industry	• Metallurgy
• Pharmaceutical industry	• Oil Refining
• Scientific Research	• Aluminum
• Cement Plants	• Petrochemicals
• Thermal Power	• Paper industries
• Steel Plants	• Glass Industry
• Distilleries Industries	• Slaughter houses
• BMWTP	• Dyeing Units

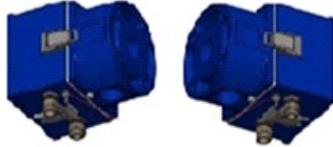
### Features:

• Remote troubleshooting feature available
• Time period for average mg emissions is user determined.
• User Determined Alarm Set Points to indicate high emissions (Optional)
• Minimal Maintenance Required.
• No Moving Parts or Consumables.
• Long Life of instrument.
• Frequent calibration, setting, alignment is not required.
• Easy to use and operate.
• Not affected by Moisture.
• Low Cost and High Quality.
• Data available on IOT (can check anywhere/anytime)

## SYSTEM SPECIFICATION (CONTROLLER)

<b>Make</b>	<b>Drexel</b>
<b>Model</b>	DX4P series
<b>Display</b>	HMI
<b>Protection</b>	IP65/IP67
<b>Dimension</b>	420mm/*320*210
<b>Voltage</b>	220 VAC (Single Phase)
<b>Operating Temperature</b>	(-20~60) °C

## SENSORS SPECIFICATION

Working Principle	Type :1 DC-Triboelectric Method	Type: 2 Light Attenuation method/Opacity	Type :3 Laser Scattering Method
Picture			
Make	Drexel	Drexel	Drexel
Model	DX4P-PM	DX4P-PM(OP)	DX4P-PM (LS)
Range	0-1000 ppm	0-1000 ppm	0-1000 ppm
Accuracy	±2 %	± 2 %	± 2 %
Voltage	DC24 /250 mA	DC 24V/0.5A	DC 24V/0.3A
Operating Temperature	(-10~ 60) °C	(-10 ~ 70) °C	(-20 ~ 70) °C
Interface	4-20 mA Optional- RS 485	4-20 mA Optional- RS 485	4-20mA Optional- RS 485
Material Use	Stainless steel 316	Casting Iron	
Stack Diameter	0.2 – 2 m	Stack Diameter more than 2m	Stack Diameter more than 2m

## SENSORS WORKING PRINCIPLE

### DC Triboelectric

#### Model: DX4P-PM

DC Triboelectric Instruments is type of probe electrification devices in which the electrical current charge produced by particles interacting with a grounded probe mounted across the stack is measured and correlated to dust concentration.

Then Electronic signal is converted which is proportional to the dust concentration on the PM Probe.

Probe electrification measuring devices detect three separate effects when particulate strikes or passes close to a conductor placed in a particle-laden gas:

- When a particle strikes the conductor, a charge transfer takes place between particle and conductor.
- As the particle strikes the conductor, it rubs on the surface and causes a frictional charge.
- As charged particles pass close to the conductor they induce a charge of equal and opposite magnitude in the conductor. The first two effects generate a DC signal measured by most DC Triboelectric devices and the third effect generates an AC signal measured by electro dynamic devices.

The length of the probe is depends upon the diameter of Stack. And it should be cover the 1/3 diameters of the stack at the sample point.



## Light Attenuation/Dust Opacity:

**Model: DX4P-PM-OP**



The Double Pass Models use the transmission measurement technique (a folded beam transceiver arrangement) in which a light emitted from the transceiver passes across the stack to a reflector, which then returns the light to the transceiver, where the intensity of the received light is measured. Increased particulate or smoke density in the stack gas attenuates the transmitted light and causes the intensity of the received light to fall which is correlate to the dust concentration in stack.

Light beam is spent cross-stack and measured on the opposite side(single path) or reflected by a reflector to the other side and measured on the sender side (double path) Measuring of the amount of light received as a ratio of the amount of light emitted: Transmission (T) is the percentage of light received Opacity (O) is the percentage of light lost Lambert-Beer Law: Linear relation between extinction and dust concentration in mg/m<sup>3</sup> Factor k for process individual components like grain size, dust density, dust dispersion.

## Laser Scattering Method:

Model: DX4P-PM (LS)

The laser backscattering monitor principle is used to measure the smoke concentration of the flue under test. The embedded highly stable laser signal source passes through the flue and irradiates the smoke particles. The irradiated smoke particles will reflect the laser signal, and the reflected signal intensity changes positively with the smoke concentration. Detect the weak laser signal reflected by the smoke, and calculate the concentration of the flue smoke through a specific algorithm. The instrument consists of three major parts: electrical system, optical system and structural parts.



DX4P-PM (LS)

The electrical system adopts digital signal processing technology and is divided into four parts: laser transmitting module, optical receiving module, central processing module and interface module. It uses advanced microprocessors and embedded software control systems to achieve adaptive stabilization of optical power and large-scale operation. Dynamic adaptive lock-in amplification, extremely low zero drift design, resistance to harsh environments and other functions provide fast, reliable and accurate quantitative smoke and dust emission data.

## Certifications

CE CE Electromagnetic Standards

TUV Rheinland

TUV Nord

ISO 9001:2015, ISO 14001:2015, ISO 45001:2018

MSME Certification UAM No. -- DL08A0013616

GST NO. 03AAECD5047M2ZM



Drexel Electronics & Engg. Products Pvt. Ltd  
Address : Plot No.442, JLPL, Industrial Area Sector- 82, Mohali (PB), 160055  
Ph : +91 1725035098 Mob : +91 9988610098  
Email : [sales@drexel.in](mailto:sales@drexel.in), [info@drexel.in](mailto:info@drexel.in)  
Web : [www.Drexel.in](http://www.Drexel.in)