

Guidelines for Continuous Emission Monitoring Systems



CENTRAL POLLUTION CONTROL BOARD
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Table 4: PM CEMS Technology Applications and Limitations

Measurement Technology		Technology	Stack Diameter (m)	Concentration (mg/m ³)		Filter Type	Self-checks		Dry	Humid	Wet	Type of dust		Velocity Dependant
				Min	Max		Sensor contamination check	Zero & span				Same	Changing	
Probe Electrification	Charge Induction (AC)	ElectroDynamic	0.2-4	0.05	1000	Bag,Cyclone, Drier,Scrubber ⁽⁵⁾ , None ⁽⁶⁾	✓ (7)	✓ (7)	✓	✓	x	✓	x	No ⁽⁸⁾
	Contact Charge Transfer (DC)	DC Triboelectric	0.2-2	1	1000	Bag,Cyclone, None ⁽⁶⁾ ,Esp ⁽¹⁰⁾	x	x	✓	x	x	✓	x	Yes
	Combination AC & DC	Combination AC & DC/ Tribo	0.2-2	1	1000	Bag,Cyclone, None ⁽⁶⁾	x	✓ (7)	✓	x	x	✓	x	Yes
Transmissometry	Ratiometric Opacity	Dynamic Opacity	1-15 ⁽¹⁾⁽²⁾⁽⁷⁾	10 ⁽³⁾	1000	Bag ⁽¹⁾ ,Cyclone,EP,None	✓	✓ (7)	✓	x	x	✓	x	No
		Dyanamic Detection Principle	1-10 ⁽¹⁾⁽²⁾	20	1000	Bag ⁽¹⁾ ,Cyclone,EP,None	✓	x	✓	x	x	✓	x	No
	Opacity	Opacity	2-10 ⁽¹⁾⁽²⁾	30 ⁽⁴⁾	1000	EP,None	✓	✓	✓	x	x	✓	x	No
		Non Compliance Transmittance	2-10 ⁽¹⁾⁽²⁾	30 ⁽⁴⁾	1000	EP,None	x	x	✓	x	x	✓	x	No
Scattered Light	Light Scattering	Forward Scatter	1-3 ⁽²⁾	0.1	200	Bag,Cyclone,EP,None	✓	✓	✓	✓	✓ ⁽⁹⁾	✓	X	No
	Light Scattering	Backward / Side Scatter	1-4 ⁽¹⁾⁽²⁾	25	500	Bag ⁽¹⁾ ,Cyclone,EP,None	✓	✓	✓	x	x	✓	X	No

- Notes: (1) Concentration dependent (5) No water droplets (9) Using extractive wet stack monitoring system
 (2) Representative Flow dependent (6) No filter-not advised (10) Advised with Faraday Shield/edge
 (3) Application specific (7) Model specific
 (4) Stack diameter dependent (8) Varying velocity range 8-20 m/sec

There are a number of Opacity instruments with TUV approvals for particulate measurement. The certification ranges for opacity monitor are dependent on path length. The measuring range of 0-1000mg/m³ is suggested for a path length of 0.5 to 15 mt. However, low range i.e. 0 to 10 mg/Nm³ can be monitored in stack with minimum 5m path length.

This information is meant as a guide and reflects the majority of technology limitations of instruments currently commercially available, however specific models may offer decreased or increased capability the actual stack conditions will dictate instrument suitability