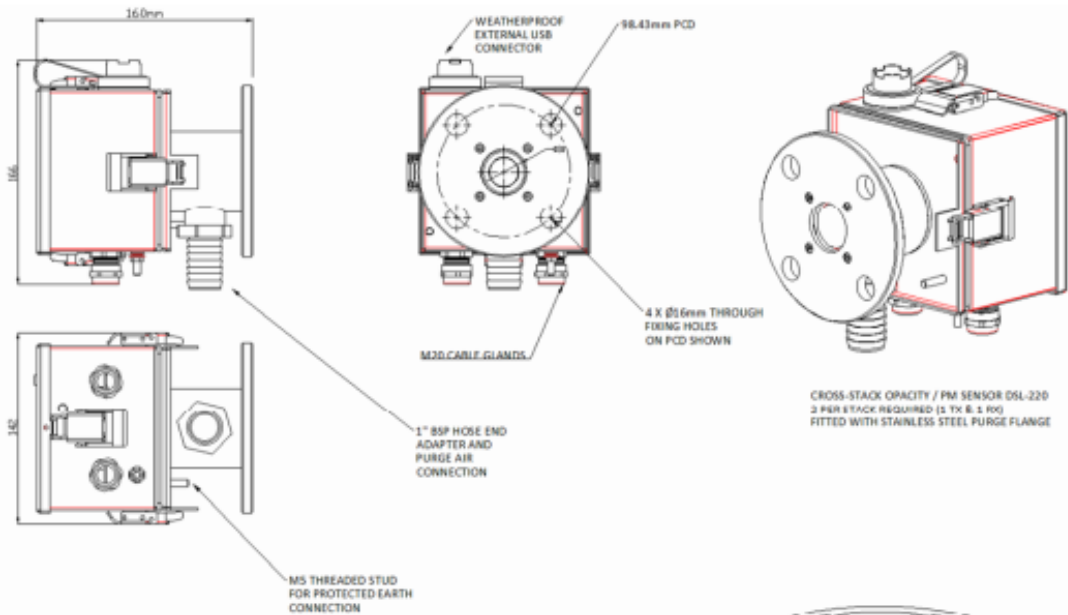
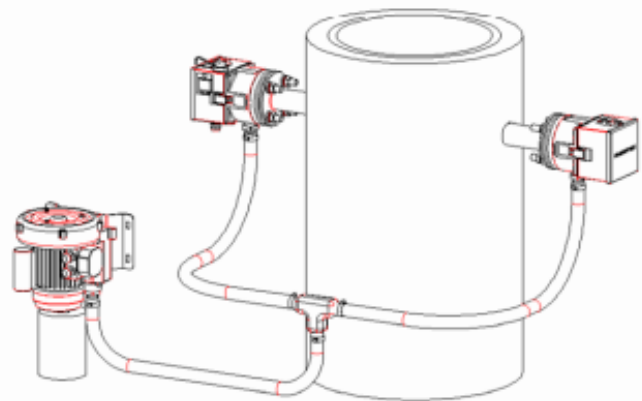


## Why Emsys?

- The Emsys-PM measures Visible Smoke and PM with one single sensor
- The Emsys-PM can be used to comply with US EPA and Alaska DEC visible smoke regulations. Additionally, with the optional OPC reporting software the PM can be used for '3-Minute Rule' reporting
- Our system has virtually maintenance free operation, and the optics are simple to clean in seconds
- We included optional alarm outputs to alert crew to changes in smoke emissions, which can prevent heavy fines during transient operations



Path length	0.5 – 5.0 metres
Measuring range	0-100%
PM output	Mg/m <sup>3</sup>
Output Protocol	MODBUS RS485
Maximum Stacks	16
Accuracy	+/- 2%
Resolution	0.1
Voltage	230VAC or 24VDC
IP Rating	IP65
Operating Temperature	-20°C - +55°C
Gas Temperature	550°C Max
Material	Stainless Steel 316L
Weight	2.5kg each
Type Approval	Lloyds Register



Typical cross-stack configuration with optional self-container air purge kit



# Technical Specification



Model Number	Emsys-iS
Ambient Temperature	0-+55 °C
Measurement Method	Extractive using Heated Filter Probes and Heated Sampling Lines, Hot-Wet sampling on a 'round-robin' basis. Sample returned to process
Measurement Technique	Multi-Channel QCL laser, IR Absorption Spectroscopy
Laser Classification	CLASS 1 BS EN 60825-1:2007 Safety of laser products Equipment classification and requirements (identical to IEC 60825-1 2007)
Repeatability	+/- 2%
Accuracy	+/- 2%
Linearity	R2 for a linear fit is $\geq 0.9990$ . Error < 2% of full scale when analyzed to MCERTS standard
Measurement Rate	Up to 10 Hz
T90 Time	>10s for all gases except NH3
Zero Noise ( 2 sigma)	< detection limit for each component
Span Noise (2 sigma)	< 2% of full range for each component
24 hour zero drift	< detection limit for each component
24 hour span drift	< 2% of full range for each component
Pathlength (Cell internal)	2m
Cell temperature	180 °C
Cell pressure	300 Torr $\pm$ 50 Torr
NO	0-2000 ppm (LOD 5ppm)
NO2	0-500ppm (LOD 1ppm)
CO	0-3000 ppm (LOD 5ppm)
CO2	0-15 % (LOD 0.1%)
SO2	0-200 / 0-500 / 0-1000 ppm (LOD 3ppm / 1ppm)
H2O	0-20 % (LOD 0.1%)
CH4	0-3000 ppm (LOD 5ppm)
Environmental Specification	Tested to IACS-E10
Analyzer Equivalence	ISO 8178/1 Part 7
Type Approvals	ABS, DNV-GL, Korean Register
# of Measurement Points	Single Enclosure – Up to 4, Multiple Enclosures (Up to 3) 12 points
Power Supply	230 VAC – Power requirement (kW) subject to # of points & length of Heated Sample Line
Air Supply	NOT REQUIRED
Enclosure Air Conditioning	NOT REQUIRED
Enclosure Rating	IP55 standard / IP56 Optional (weather deck mounting)
Enclosure dimensions	800mm (H) x 600mm (W) x 300mm (D)
Exhaust duct sizes	300mm – 5metres
	IACS E10
Communications Protocol	MODBUS RTU
Typical Applications	MARPOL Annex VI (NOx), engine testing, EGCS compliance monitoring, methane slip measurement, mass emissions totalizing, funnel smoke monitoring, charterer's CSR reporting, Class Notation compliance
US Patent	8,184,296,B2
EU Patent	EP 2 394 153 B1
Heated Filter Probe / PAB Enclosure / PM Enclosure Rating	IP65