DUST FLOW PCME

PARTICULATE MONITORING SYSTEMS

ADVANCED DYNAMIC OPACITY MONITORS

Continuous particulate emissions monitoring and recording system comprising sensor heads and combined control unit/microprocessor-based datalogger

SC620 & SC680

DUST EMISSIONS

MONITORING

SYSTEMS

mCERTS

NQA ISO9002 REGISTERED COMPANY

Certificate No: 9389

CE

- Instruments accredited to MCERTS standards for combustion applications (0-150mg/m^3) meets ISO10155 standard for particulate monitors
- Full Environmental report and analysis facility by linking to a PC and printer/recorder via optional DustReporter software
- Up to 4 channels of monitoring via expansion module and 255 channel capability
- Employing dynamic opacity technology offering very low maintenance and inbuilt self-checks with no blower motors
- Higher specification SC680 model with inbuilt self-checks, diagnostics, advanced system features and onboard 24hr memory review and calibration

What It Does

The SC620 & SC680 range are microprocessor based optical measuring systems, which use a dynamic sensing technique to measure the rate of change of light (Dynamic Opacity) as particulates pass through an infrared light beam. This proven optical technique coupled with advanced design features offers significant reliability and resolution advantages over traditional Opacity monitors and virtually overcomes lens fouling associated with standard Opacity monitors. The SC620 & SC680 meet European monitoring requirements and are suitable for continuous monitoring of particulate emissions from flue stacks, combustion processes, Electrostatic filters as well as other types of arrestment plant.

The performance of the SC620 & SC680 have been validated through the UK Environment Agency's MCERTS approval process which is based on International Performance Standards (ISO-10155 for Particulate†). In addition the SC680 has automatic zero and span checks for full regulatory compatibility, along with process control benefits derived from its advanced features.

†Refer to MCERTS certificate for details of complete range covered by approval.

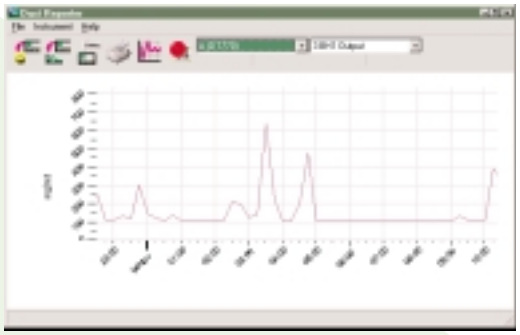
PC Based DustReporter Software

Realtime Display

- Dust data displayed in real time for individual or multiple sensors
- Zoom scaling permits both instantaneous and long term trend analysis
- Early warning and high level alarms activated and displayed for each channel
- Status panel provides easy interpretation of sensor status and alarm condition for all sensors
- Easy access to historical data and maintenance logs

Datalogging and Reporting

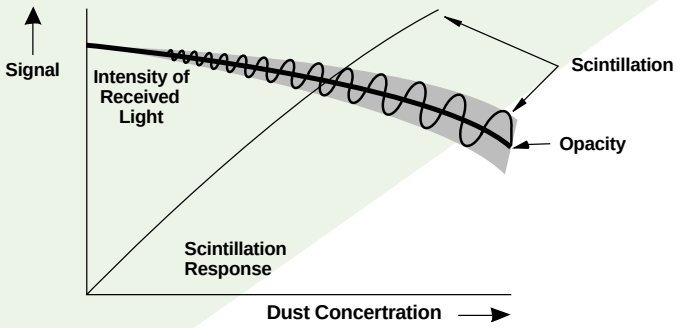
- Extensive and fully configurable data logging and data reporting
- Data storage occurs while other application programs are being run
- Archiving feature assists effective management of data older than 4 years
- Preconfigured environmental reports
- Maintains history of dust and instrument alarms and corrective actions
- Normalised concentration and mass emission reports (option)



Single channel report

Principles of Operation

The SC620 & SC680 continuous particulate monitors work on the principle of optical scintillation. This technique monitors the variation in the amount of received light from the light beam transmitted across the stack. The variation derives from the temporal distribution of particulate which attenuates the light beam. The SC620 & SC680 calculates the dynamic response (ratio of light variation to light intensity or obscuration). This method has the added benefit that the measurement is unaffected by lens contamination. The instrument response which is proportional to dust concentration is used to calculate Ringelmann, extinction and is calibrated to read in mg/m³ by reference to an Iso-kenetic sample (mass gravimetric technique). As the instrument is already measuring obscuration then Opacity can also be given as an output. (SC680 only)



Technology Overview

The SC620 & SC680 gives extended periods of operation without maintenance. In addition the intrinsic technology benefits of the Dynamic opacity technique is used to reduce or eliminate zero drift and stray light interference affects.

ZERO AND SPAN DRIFT

- The ratio of the signal scintillation to absolute light intensity is measured which compensates for any effects of lens build-up, misalignment or light source ageing. **Measurement in scintillation mode is unaffected until lens obscurity is greater than 90%.**

  If the light intensity (I) is reduced by a contaminant coating on the lenses, the variation in intensity (x) is affected in the same proportion, giving no net effect.

Lens condition	Light intensity	Variation	Scintillation
100% transmission	I	x	x/I
90% transmission	0.9I	0.9x	0.9x/0.9I = x/I
50% transmission	0.5I	0.5x	0.5x/0.5I = x/I

- Air purges can be used to minimise build-up in the first place.

STRAY LIGHT

- A modulated light beam enables the detector to eliminate stray and ambient light effects.

Memory Capacity (Per Dust Channel)

Storage and averaging of memory	Adjustable over range of 1 minute to 8 hours
24 hour memory (SC680)†	Rolling 24 hours at 30 second store rate†
Average memory	16,000 data points (eg 600 days at 1 hour store rate)

†Denotes SC680 only.

Functions

Monitoring units	mg/m^3, mg/Nm^3, g/m^{3*}, units & Opacity
Displayed units	Calculated Opacity, Ringelmann, Extinction
Calibration mode (mg/m^3)	Computes calibration factors associated with isokinetic sampling
Review memory	Graphics or listing display of stored data (both 24 hours & long term data)†
Channel name	10 letter name (eg kiln stack) to identify stack
Access security	2 password levels protect unauthorised entry
Data security	Data stored in non-volatile memory (battery back-up)
On-line mode	Displays on-line data from Receiver unit

Inputs/Outputs (per channel)

Type	Name	Specification	Function
Output	Dust emissions	4-20mA isolated (max 250Ω)	Scalable over full range of emissions
Output	Serial O/P	RS-232	Download of emissions data to PC (via DustReporter)
Output	Relay 1	Single pole make	Emission Alarm 1/Instrument Alarms
Output	Relay 2	Single pole make	Emission Alarm 2
Input	Digital 1	Digital	Plant running signal
Input	Digital 2	Digital	Bag cleaning reference pulse
Input	O_2 input	Linear 4-20mA (0-25% O_2)	Normalisation for Oxygen
Input	T input	Linear 4-20mA (0-1000°C)	Normalisation for Temperature

Mechanical/Electrical

	Control Module	Expansion Module
Enclosure rating	IP65	IP65
Enclosure size (mm)	260 x 160 x 90	360 x 160 x 90
Enclosure weight (kg)	3kg	4.5kg
Enclosure material	Die-cast aluminium (epoxy-coated)	Die-cast aluminium (epoxy-coated)
Power supply (switchable)	110V AC or 240V AC 50Hz 10VA	110V AC or 240V AC 50Hz
Fuse rating	250mA	250mA
Display type	Backlit LCD providing numerical and graphical display	N/A
Temperature range	-25° to 55°C	-25° to 55°C
No. of dust channels	1	Up to an additional 3

Sensors and Cables

Enclosing rating	IP65
Cable type	8 core screened
Cable length	20 metres standard: 300 metres max
Sensor head material	Die-cast aluminium (epoxy coated) and 304/316 stainless steel
Coupling material	Stainless steel
Flange sizes	DN40 PN6

Air purge Airline connection Air consumption	 ¼" BSP up to 0.5 litres/second per head
Sensor types	-25° to 250°C - standard -25° to 400°C - optional -25° to 800°C - optional
TX/RX head weight	1.5kg

Monitoring Range

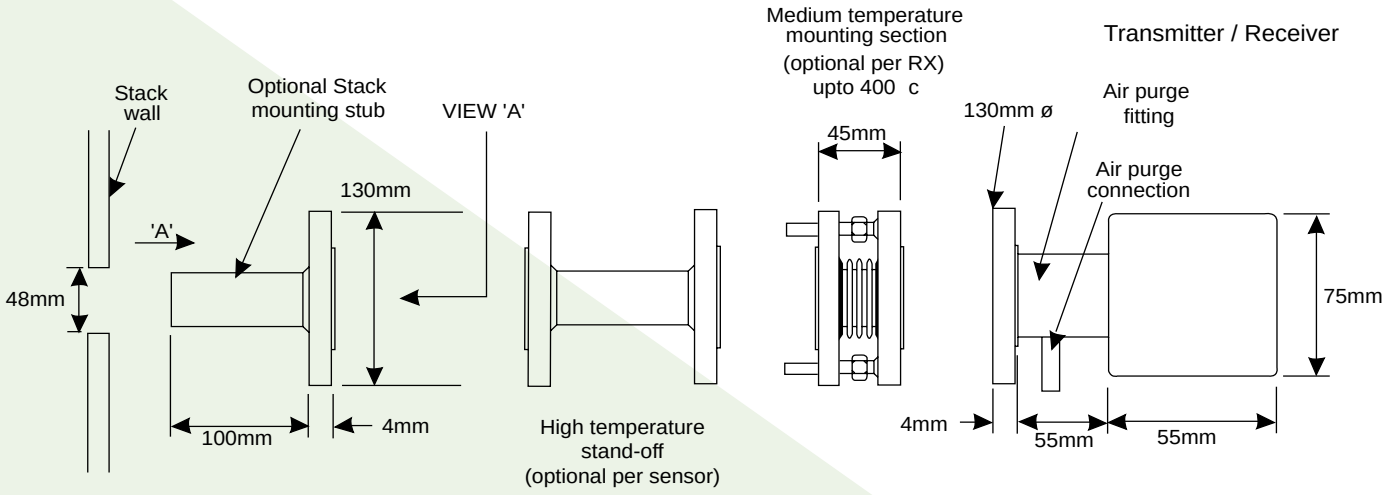
Dust concentration	<2.0 to 10,000mg/m^3/m
Stack temperature (option)	-25° to 800°C

Stack sizes	0.3 to 10 metres
Output range	User defined over full range

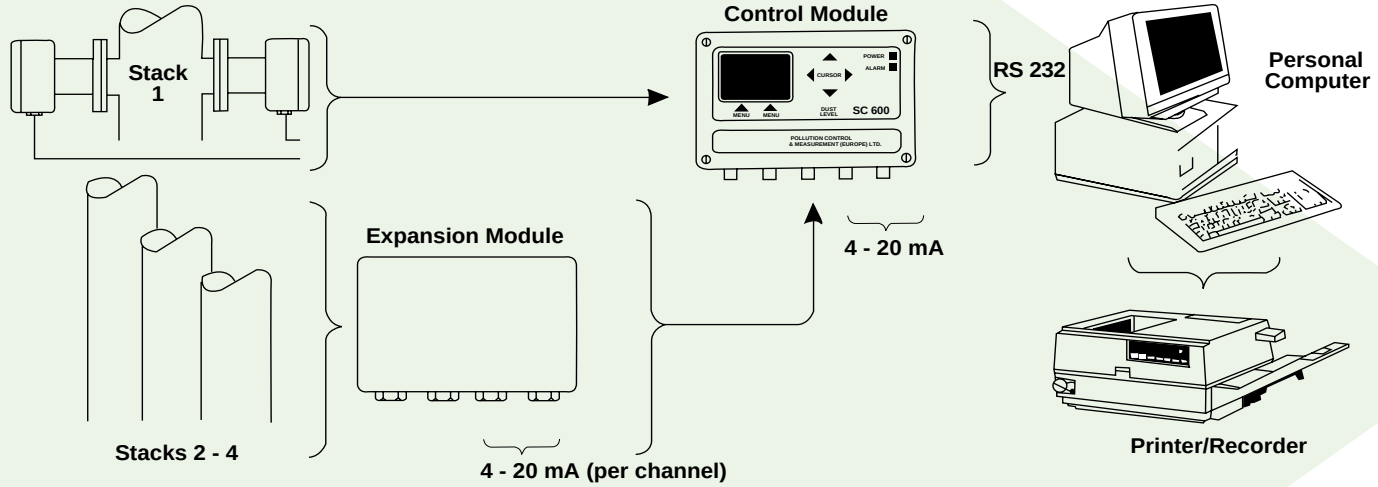
Instrument Specifications

Resolution	0.2mg/m^3 0.01% opacity
Response time	<10 seconds for 95% change (user selectable)
Self checks	Automatic zero, span and lights checks†
Light source	Modulated LED (infrared spectrum)

Physical Dimensions



System Overview



Order Codes

CONTROL UNIT

SC6X0

620 = Calibration 24hr logger
680 = Calibration + long term datalogger with DustReporter software

TRANSMITTER / RECEIVER & CABLE

SC6X0 / XXX / XXX

Cables in metres
10m standard, 300m max

Stackgas Temperature:
(enter stack gas temperature)
up to 250˚c standard
up to 400˚c optional
up to 800˚c optional

For higher temperatures please consult PCME Ltd.

About PCME

PCME is a world leader in particulate measurement. The company produces equipment for emissions monitoring, process control and solids flow monitoring. A dedicated team of qualified application and sales engineers is always on hand and should be consulted in the selection and usage of the most suitable equipment for any particulate application.

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