

# Particulate Monitoring Systems

MCERTS Approved

Continuous Particulate Emissions Monitoring comprising probe, combined control unit/microprocessor-based dataloggers and PC based software data acquisition

DT780 & DT280

Dust Emissions

Monitoring

Systems



Certificate No: 9389



- Instrument accredited to MCERTS standard (Class 4, 0-30mg/m<sup>3</sup>)
- Enhanced measurement through unique Electrodynamic<sup>®</sup> technology
- Up to 4 channels of dust monitoring via expansion module & up to 255 channels capacity
- Windows based software for analysis and full reporting facility complies with UKEPA, IPC and IPPC
- Capable of monitoring in dry, humid and wet gas streams using patented insulated probe option
- Higher specification DT780 model with inbuilt self checks, diagnostics and advanced system features, complies with BAT (Best Available Technique)

## Principles of Operation

The DT780 & DT280 utilise PCME's unique Electrodynamic measurement principle. When the sensing probe is installed in the duct or stack, particles in the air stream interact with the sensing rod and a charge induction effect is analysed from the probe. Distributions in the particle stream result in a frequency charge induction response, which is directly proportional to the concentration of particulate. The instrument's output is an analysis of this frequency response.

PCME's Electrodynamic technique enables the use of fully insulated probes, essential for use in high humidity and wet gas streams as well as applications with high conductive dust loadings. Very Low Dust concentrations can also be measured due to this unique measurement principle.

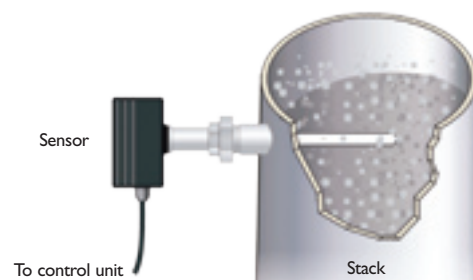
The performance of the DT780 & DT280 have been validated through the UK Environment Agency's MCERTS approval process which is based on International Performance Standards (ISO-10155 for Particulate†). In addition the DT780 & DT280 has automatic zero and span checks for full regulatory compatibility, along with process control benefits derived from its advanced features.

Unlike Triboelectric systems the Electrodynamic measurement is not significantly effected by velocity variations\* and is not effected by build up on the probe, which can cause zero and calibration drift.

\* Refer to Environment Agency IPC Guidance Notes

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

N.B. PCME's frequency induction technique and insulated probes are covered by world-wide Patents.



## Instrument Modes of Operation

The DT780 & DT280 calculate and record both the EPA averages and instantaneous levels of emissions. Both instruments can be calibrated to quantitatively monitor in mg/m<sup>3</sup>, by comparison with the results of an isokinetic sample.

### BROKEN BAG MODE (DT780)

- Graphically displays filter cleaning cycle (Broken Bag Mode)
- Permits anticipation of arrestment plant failure
- Assists diagnosis of location of broken bags

### PROCESS CONTROL MODE (DT780)

- Stores instantaneous emission for past 24 hours
- Emissions can be reviewed using on-board graphical display for effective trend analysis

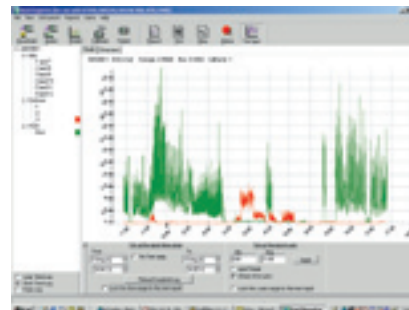
## PC Based DustReporter Software

### 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)



Typical Emission Graph

## Instrument Features

- Environmental and Process Control modes
- Records both EPA data and instantaneous data (back-up data via inbuilt data loggers)
- Broken bag diagnostics (PREDICT- remote broken bag diagnostics optional)
- Simple calibration method after isokinetic sampling (DT780)
- System expandable to 255 sensors
- Secure data and password protection
- Interlinks with DustReporter analysis and reporting software for on-line control and historical reporting using PC
- 24 hour memory for on-board calibration and process control analysis (DT780)
- †18 month memory capability via inbuilt datalogger
- Readings can be normalised to oxygen (option)

## Electrodynamic® Features for Enhanced Measurement

- Dynatrack** Instrument automatically adjusts its dynamic range to track fast moving dust pulses (typically found after reverse jet cleaning baghouses) to ensure good measurement
- AGC** The instrument automatically adjusts its gain control to suit varying dust loading applications (no need for user to adjust gain controls or potentiometers)
- AZC** Automatic Zero Compensation eliminates drift due to frequency driven signal processing.
- Alpha check** Inbuilt system check, processor driven for system integrity
- Beta check** Digital communication check for sensor integrity
- ECD** Inbuilt Error Code Diagnostics visually displayed for user information (DT780)
- Gamma check** Instrument zero, span and probe short circuit check (DT780)

# product features

## Memory Capacity (Per Dust Channel)

24 hour memory	Rolling 24 hours at 30 second store rate
Broken Bag	Displays one complete cleaning cycle
†EPA memory	16000 data points (e.g. 600 days @ 1 hour store rate)
†Storage and averaging of EPA memory	Adjustable over range of 1 minute to 8 hours

## Functions

Monitoring units	mg/m <sup>3</sup> , g/m <sup>3</sup> , units or user defined
Calibration mode (mg/m <sup>3</sup> )	Computes calibration factors associated with isokinetic sampling
Review memory	Graphics or listing display of stored 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
Broken bag mode	Displays bag cleaning cycle in progress

## 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 DustReporter2)
Output	Relay 1	Single pole make rated 2A, 230V	Emission Alarm 1/Instrument Alarms
Output	Relay 2	Single pole make rated 2A, 230V	Emission Alarm 2
Input	Digital 1	Digital	Plant running signal
Input	Digital 2	Digital	Bag cleaning reference pulse
Input	Alt. Sensor	0-10V, or 4-20mA	Ancillary input**

\*\*Auxiliary input boards connected to spare channels in the expansion module can accept readings from any sensor with 4-20mA output. (optional extra)

## Control/Expansion Unit

	Control Module	Expansion Module
Enclosure rating	IP65	IP65
Enclosure size (mm)	160w x 90d x 260 l	160w x 90d x 360 l
Enclosure weight (kg)	3kg	4.5kg
Enclosure material	Die-cast aluminium (epoxy-coated)	Die-cast aluminium (epoxy-coated)
Power supply (switchable)	110Vac or 230Vac 50Hz/60Hz 10VA	110Vac or 230Vac 50Hz/60Hz
Fuse rating	250mA	250mA
Display type	Backlit LCD providing numerical and graphical display	N/A
Temperature range (electronics)	-25° to 55°C	-25° to 55°C
No. of dust channels	1	Up to an additional 3

## Instrument Specifications

Resolution	<0.01 mg/m <sup>3</sup>
Response time	<10 seconds for 95% change (user selectable)
Self checks	Automatic zero, span and probe short-circuit checks

## Sensors and Cables

Sensor types Standard temperature Optional	upto 250°C upto 400°C upto 800°C Over 800°C consult factory
Sensor lengths	100, 200, 300, 400, 500, 600, 800, 1000 & 1500mm.*
Cross-stack probes*	From 2000 to 6000mm available on application
Connection required on duct	1 ½ " BSP (female)
Enclosure weight	1.8 kg

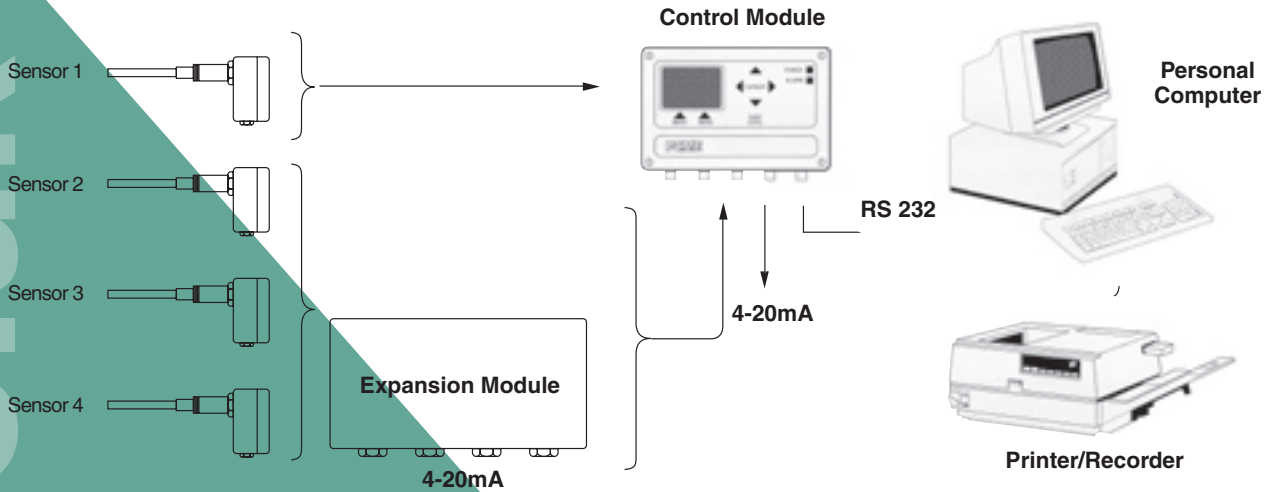
\* optional extra

Enclosure temperature rating	-25°C to +55°C
Enclosure rating	IP65
Sensor rod material Special	316 stainless steel Fully insulated Sensor*
Air purge option Airline connection Air consumption Air pressure	¼" BSP Up to 0.5 litres/min 4 barg min, 10 barg max
Sensor enclosure material	Die-cast aluminium (epoxy-coated)
Cable from sensor	8-core screened
Cable length	10 m standard : 300m max

N.B. † Refers to options available on DT770 only

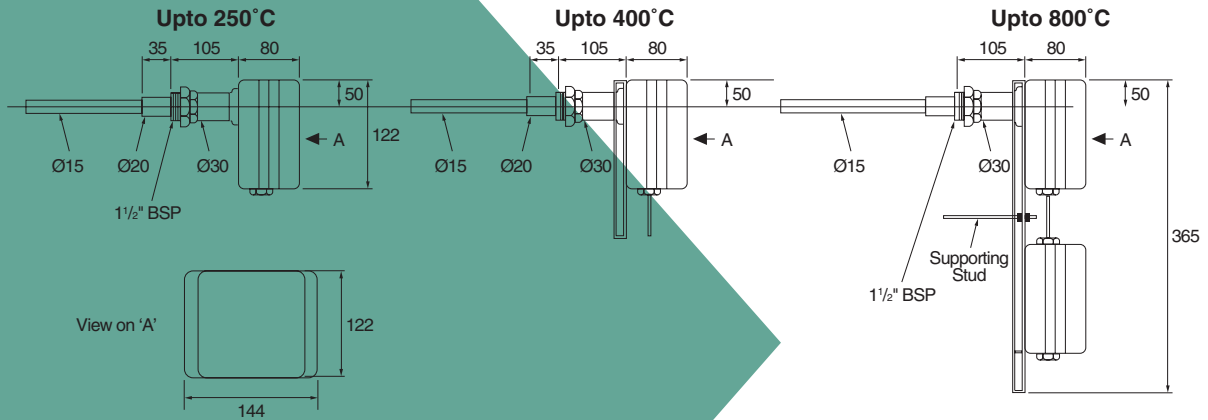
# specifications

## System Layout



For connection details, refer to Installation and User Manual

## Physical Dimensions



## Product Ordering Codes

### CONTROL UNIT

### EXPANSION UNIT

XXXX-X / -X

XXXE-X / X

Power: 115Vac = 1  
230Vac = 2  
Special = Z

Power: 115Vac = 1  
230Vac = 2  
Special = Z

Total Number of Channels:  
(Standard = 1)  
(Maximum = 4)

Number of sensors connected to  
expansion unit (1 to 3)  
(see connection schematic)

DT280 or DT780

DT280 or DT780

### SENSOR UNIT AND CABLE (SPECIFY FOR EACH CHANNEL)

\$ XXXS-X / X / X / X -X

Cable length in metres  
(10m standard) 300m max  
Temperature: upto +250°C  
upto +400°C  
upto +800°C  
Duct diameter in mm  
Air purge: No air purge = N  
Air purge = AP  
Material: Standard = S  
Insulated = I  
Special = Z  
DT280 or DT780  
Non-metric (Imperial) units

## About PCME Ltd

As a progressive environmental Company, PCME specialises in particulate measurement for industrial processes. With a worldwide reputation for reliability, innovation and technological excellence, the Company produces equipment for concentration, velocity and mass monitoring for regulatory, environmental and process control requirements. 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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