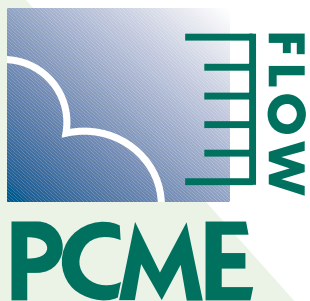


DUST



PARTICULATE MONITORING SYSTEMS

Continuous Measuring System for Particulate Emissions

*Next generation DT270, DT770 Comprising Multiple
Sensors and Combined Control Unit/Data Logger*

DT990

PARTICULATE

EMISSIONS

MONITORING

SYSTEMS

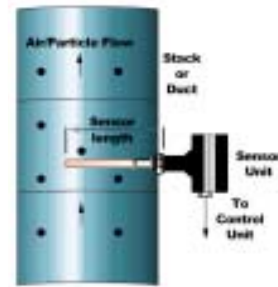


Certificate No: 9389

- Advanced unique sensor design includes zero, span and probe contamination checks
- Powerful and advanced graphic and user interface screens
- Upgradeable to include control of up to 32 sensors plus additional 32 calculated channels (eg Mass, mg/Nm³)
- Electrodynamic measurement with Digital Signal Processing giving high accuracy measurement
- Full data recording for process analysis and legislative compliance
- PC reporting, graphing and data analysis software (optional)

Principles of Operation

The DT990 combines advanced signal processing techniques with PCME's unique Electrodynamic measurement principle. When the sensing probe is installed in the duct or stack, particles in the airstream interact with the sensing rod causing a charge induction effect which is analysed in the probe. Distributions in the particle stream result in a frequency charge induction response, which is directly proportional to the concentration of particulate (application dependant). The instrument's output is an analysis of this frequency response and can be calibrated in mg/m³ by comparison to reference iso-kinetic sample results. This technique has achieved ISO 10155, MCERTS & TUV approval.



Advanced Design

Unlike Triboelectric systems, the Electrodynamic measurement is not significantly affected by velocity variations between 8m/s and 20m/s and is not affected by build up on the rod surface. The DT990 is, therefore, suitable for emission measurement in the most aggressive environments including those stacks with variable velocity.

In addition, PCME's Electrodynamic technique enables the use of patented fully insulated probes, essential for high humidity gas streams and applications with high conductive dust loadings. Very low concentrations (<0.01mg/m³) can be measured due to this unique measurement principle. Automatic gain controls allow the system to optimise its response to varying dust levels e.g pulsing bagfilters.

Features include:

- Normalisation for T and O₂*
- Broken Bag diagnostics for pulse cleaned Bagfilters
- Mass calculation (kg/year) capability for both fixed and varying velocity applications (varying velocity requires velocity input).

*Assumes input from appropriate monitor.

Advanced Sensor Features

Advanced probe and quality assurance checks

The DT990 includes the most advanced automatic functionality checks available on any probe system to provide full regulatory compatibility. The unique contamination circuit monitors for any leakage currents or signals across the insulator, hence providing the ultimate proof that the sensors measurement integrity is uncompromised. The automatic zero and span checks then provide proof that the electronic amplification and conditioning of the signal is performed within pre-defined tolerances. The above features form part of World-Wide Patents.

Automatic self-checks

- Zero Check
- Span Check
- Contamination Check



Applications

Particularly suitable for bag filter, cartridge filter and dust collector applications



Enhanced measurement accuracy

Advanced signal processing techniques are used within the sensor electronics to provide the following measurement features:

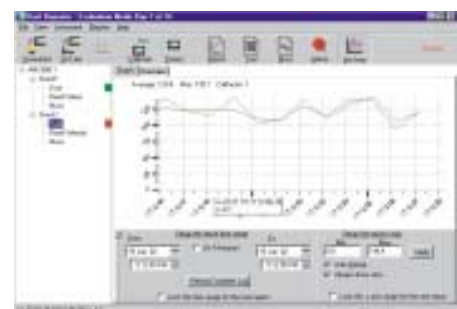
- Rapid Dynamic Ranging of 10,000: 1 (Dynatrack) permitting bag cleaning pulses to be accurately monitored while maintaining high accuracy in background emission measurement
- Rolling and digital average calculations for accurate emission reporting

PC Based DustReporter 2 Software (optional)

Analysis and Historical Reporting:

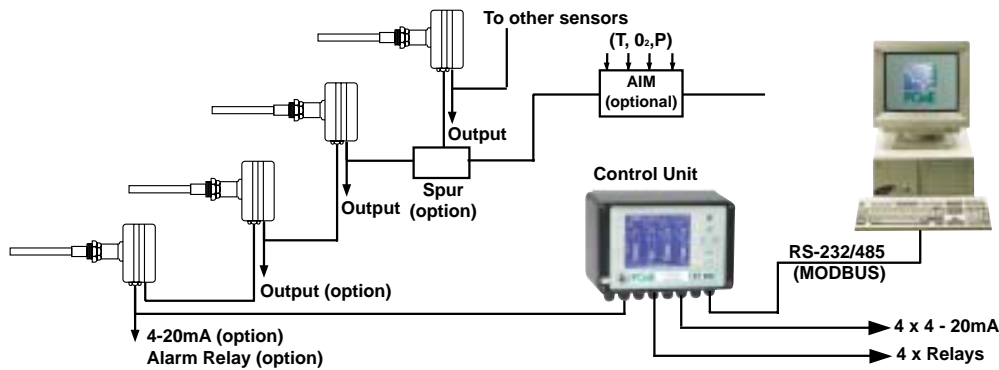
- Automatic* or user controlled transfer of data from control unit's internal dataloggers to PC for further analysis and reporting
- Pre-configured and user configurable environmental report formats to satisfy legislation*
- Easy access to historical data and alarm logs*
- "Zoom" function permits data to be viewed rapidly and concisely for analysis
- Windows 95, 98, 2000, XP and NT compatible
- Mass emission reports*
- On-Line alarm overview and graphs from various sensors displayed on PC screen*
- Bagfailure location*
- Real-time alarm overview

*optional features



Typical Emission Graph

System Layout



The instrument design permits up to 32 sensors to be connected to a single central control unit. The control unit provides power for the sensors (additional Power Supply Units (PSU) required on larger systems) and industry standard outputs (4-20mA, RS 232/485 Modbus) are provided for easy connection to plant control systems. The control unit also comprises a powerful data logging capability to permit process and regulatory reporting. In addition, filter failure detectors (220 sensor for alarm detection only) can be connected to the control unit.

Control Unit Features



- Displays instantaneous and average emissions (bargraph, text and on-line graph)
- Customisable 'channel grouping' screen for displaying related data e.g. dust, velocity, O₂
- Icon and multilingual user interface
- Monitors data from external sensors*, for normalisation and centralised analysis e.g. velocity, O₂, Temp etc.
- Status screen for concise display of alarm conditions
- Controls up to 32 sensors
- Dual alarm levels with alarm delays
- Alarm log for instrument and emission alarms



- Full on instrument review of three simultaneous memories (Long Term** Short Term and Pulse see below).
- Windows software to download to PC for reporting (option)
- Large back-lit graphical display (320 x 240 pixels) for easy interpretation of graphical data
- Fully calibratable in mg/m³ (when calibrated against recommended ISO tests)
- Full overview of current condition of system. i.e. zero, span, probe contamination, comms.
- Multiple calibration factors
- Multi-channel bargraph shows emissions relative to alarms
- Permits easy comparison between emission sources
- Password protection



*Requires optional AIM units

**Optional features

Control Unit

| | |
|-----------------------|--|
| Multichannel support: | 1 to 32 sensors |
| Enclosure rating: | IP65 |
| Enclosure Size (mm): | 260w x 160h x 90d |
| Power Supply: | 90 to 260 VAC (50/60Hz) |
| Current Rating: | 250mA |
| Display Type: | Backlit LCD providing graphical and text display |

| | |
|--------------------------------|---|
| 4 x Isolated 4-20mA Outputs | Assignable to any channel |
| MODBUS RS-485 & RS-232 Outputs | Connection to PC or PLC |
| 4 x Relay Outputs | Configurable and assignable |
| 4 x Digital Inputs | e.g Plant on/off, bagfilter cleaning pulse, multiple calibrations |

Note: Local 4 - 20mA and Relay output also available from each sensor (option) and from output expansion module (option)

Simultaneous maintenance, control and reporting

| Control Unit Memory Type | Order Code | Purpose | Storage Rate / Capacity | Typical Log Period for 8 Sensors |
|--------------------------|------------|---|---------------------------------|----------------------------------|
| Long Term - optional | L | Calculating Emission Averages (for reporting) | 1 min - 2 hours 150k entries | 204 Days (@ 15 minutes) |
| Short Term - included | S | Visibility to Process Trends | 1 sec - 4 mins, 20k entries | 20 hours (@ 30 seconds) |
| Pulse - included | P | Locating Broken Bags | Optimised (13k entries) | 25 minutes |
| Alarm Log - included | A | Log of all alarms | Instantaneous | 1000 entries |

Sensors

| Order Code | |
|------------------------------|--|
| Probe Type | S 316 Stainless Steel |
| Standard | I Totally Insulated Sensor PTFE up to 250°C |
| Insulated (option)* | C Ceramic up to 800°C |
| Stack Diameter (mm) | D Standard Probes for up to 3m Cross Stack Probes for up to 6m |
| Temperature Range (flue gas) | 250 Up to 250°C (standard) 400 Up to 400°C (optional) 800 Up to 800°C (optional) |

| Order Code | |
|------------------------------|-----------------------------------|
| Local Outputs - standard | N No Outputs |
| - optional | O 1 x 4-20mA/1 x Relay |
| Stack/Duct Connection | 1½" BSP female |
| Enclosure Weight | 1.8kg |
| Enclosure Temperature Rating | -25°C to +70°C |
| Enclosure Rating | IP65 |
| Sensor Enclosure Material | Die-cast Aluminium (epoxy-coated) |
| No Air Purge (standard) | N |
| Air Purge (optional) | AP |

*probe contamination check not available

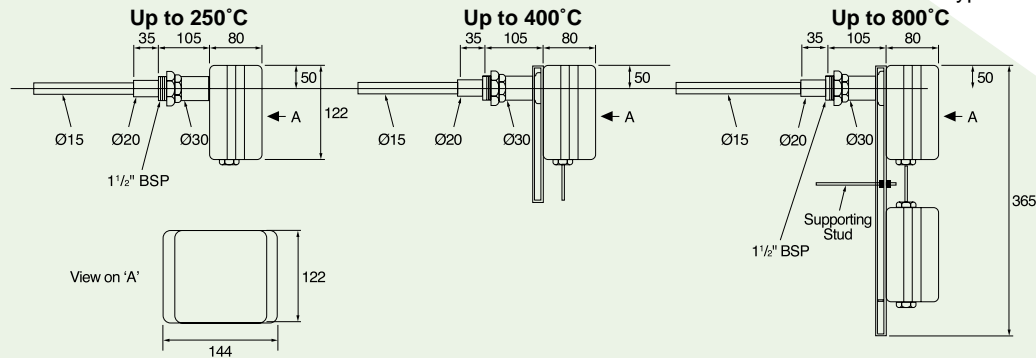
Order Codes

Control Unit Order Code: 990C - X

Sensor Order Code :
990S - X X X X X

N=No longterm memory
L=Longterm data logger included

Local Output (4-20mA + alarm)
Temperature Range
Stack Diameter
Air Purge
Probe Type



Optional Components

| Component | Purpose | Specification | Size (mm) |
|-----------------------------|--|--|--|
| Cable | Power and communication to sensors from control unit | 4-core screened (2 for 24V DC, 2 for RS-485 COMMS) | 10m per sensor (included) Extendable to >1000m* |
| AIM (Analogue Input Module) | Input data from external devices (eg Temp and O ₂) | 4 x 4-20 mA inputs 4 x Digital Inputs (contact closure) | 160w x 80h x 65d |
| SPUR | Divides cable into 2 branches | 3 cable connections | 100w x 66h x 46d |
| ATEX approved system | For use in dust zones (20,21 or 22) | | |
| PSU/Repeater | Voltage and signal boost for extended cabling runs with multiple sensors | 90 - 260 VAC input (50/60 Hz) 24V DC output | 222w x 125h x 81d |
| 220 sensor | Broken bag detector | Temperature up to 250°C | ½" BSP stack connector |

*can be extended further by use of additional PSU

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.

PCME Ltd
Clearview Building, Edison Road
St. Ives, Cambs PE27 3GH
Tel: Int +44 (0)1480 468200
Fax: Int + 44 (0)1480 463400
E-mail: sales@pcme.co.uk
www.pcme.co.uk

Contact your national or area sales and service office

PCME products are the subject of worldwide patents. Due to the continuing product development programme, PCME reserves the right to change any specifications without prior notice.