PCME-US

PARTICULATE MONITORING SYSTEMS

Continuous Measuring System for Particulate Emissions

Up to 32 Sensors and Combined Control Unit/Data Logger

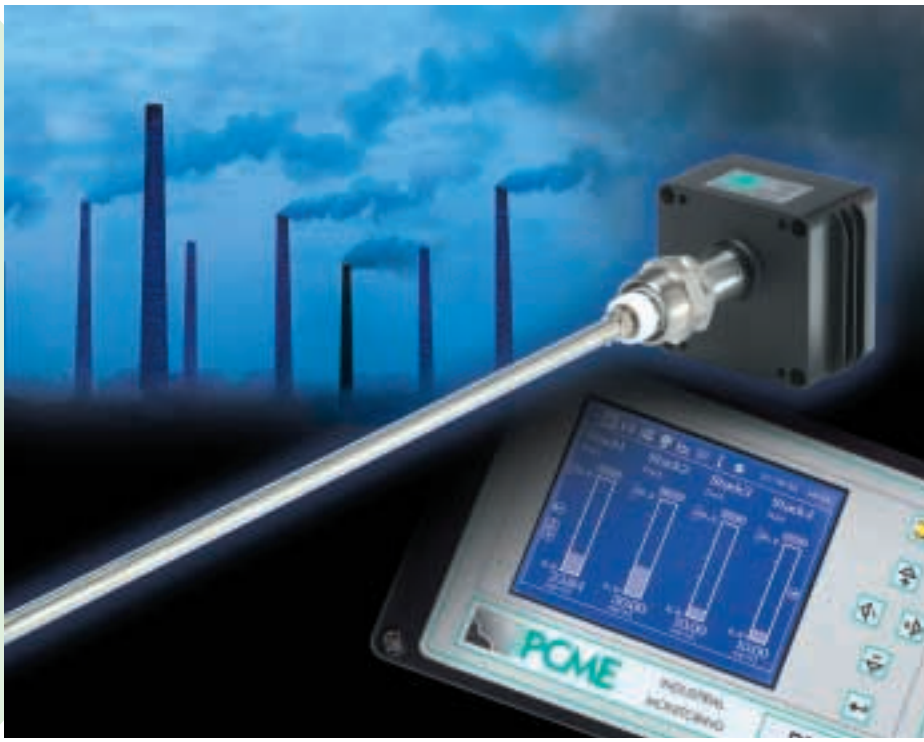
DT990

PARTICULATE

EMISSIONS

MONITORING

SYSTEMS



CE

ISO9001

Certificate No: 9389

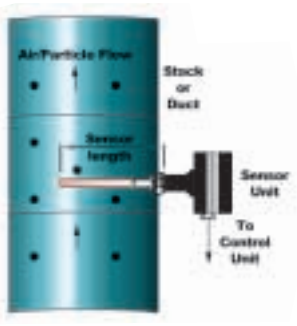
- Advanced patented sensor design includes automated zero, span and probe contamination checks
- Powerful and advanced graphical and user interface screens
- Patented electrodynamic measurement with Digital Signal Processing giving high accuracy measurement
- Full data recording for regulatory (MACT) reporting and process analysis compliance
- PC reporting, graphing and data analysis software (optional)
- Ethernet, remote access and email connectivity for remote service center support

Principles of Operation

The DT990 uses patented AC electrodynamic technology, an advanced triboelectric method. The DC signal created by particles colliding with a probe inserted in a stack is electronically filtered out, leaving an AC signal resulting from charged particles passing and interacting with the rod. Since the signal includes no DC component, the instrument has minimal cross sensitivity to changing velocity* and has increased stability even with dust build up on the rod sensor. The dust signal is amplified, digitized and processed at the probe, consistent with good signal to noise design techniques. The processed signal is proportional to dust concentration although the exact correlation is application dependent. The DT990 has had this linear relationship validated in independent certification tests (Specifically German TÜV, BImSchV 17).

An insulated probe option is also available to minimize false signals resulting from dust build up at the base of the sensor, which can occur in process dryer and conductive dust applications. Unlike other insulated sensors, this sensor operates with AC signal analysis which provides measurement stability, velocity insensitivity* and tolerance to dust coating on the sensing part of the rod.

*Insignificant effect for velocities between 8-20 m/s



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

The DT990 is 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 1,000,000:1 (Dynatrack) permitting bag cleaning pulses to be accurately monitored while maintaining high accuracy in background emission measurement
- Proper rolling averages (rather than signal filtering) for accurate emission reporting in dynamic processes
- Reproducibility between sensors greater than 50 (certification range/ standard deviation between 2 instruments in independent certification)

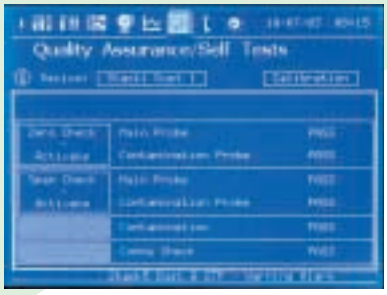
Satisfying MACT Standards

The DT990 satisfies, cost effectively, the EPA guidance procedure for fabric filter bag leak detection, by reducing the ongoing cost of quality assurance activities.

The DT990 sensor has automated zero and span checks to meet the monthly electronic drift check requirements in the EPA guidance. This would otherwise be accomplished manually by disconnecting the probe and testing with a special signal generator (see DA550).

The EPA guidance also requires periodic inspection and cleaning of the probe to alleviate problems with dust build up. **But how often is this necessary?** The DT990 has a patented built-in dust build-up check (contamination check), which provides a contamination value and alarm when dust build up is a problem. This removes the need for frequent removal of the probe for inspection which would otherwise be necessary.

The QA screen (shown) provides a summary of all drift check and contamination results.



Also consistent with EPA Guidance, the instrument has two options to set alarms:

1) Using dust peak height as an early indication of filter failure.
2) Using average dust level to identify significant filter failure. Alarm delay is used to discriminate filter failure from dust pulses arising from bag cleaning.

Recording of emission alarms and average emissions is built into the control unit and 'DustReporter 2' PC software is used to download data from the control unit and produce reports.

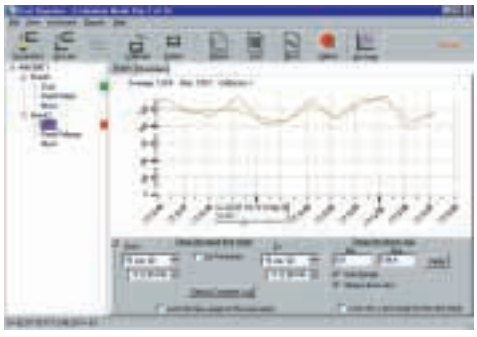
Its minimum detection level of 0.01mg/m^3 easily meets the EPA requirements under the MACT Standards.

PC Based DustReporter 2 Software (optional)

Analysis and Historical Reporting:

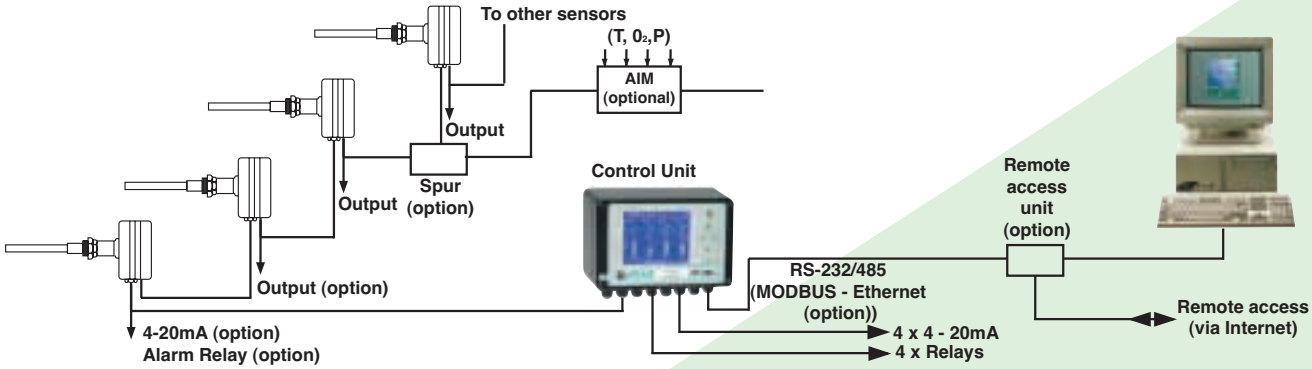
- Automatic* or user controlled transfer of data from control unit's internal dataloggers to PC for further analysis and reporting
- Pre-configured and user configurable environmental report formats*
- Easy access to historical data and alarm logs*
- "Zoom" function permits data to be viewed rapidly and concisely for analysis
- Windows 95, 98, 2000, XP and NT compatible
- On-line alarm overview and graphs from various sensors displayed on PC screen*
- Bag failure location* (Predict)
- 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)
- Configurable 'channel grouping' screen for displaying related data e.g. dust, velocity, O_2
- Icon and multilingual user interface
- Monitors data from external sensors*, for normalisation and centralized analysis e.g. velocity, O_2, 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/m^3 (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
Order Code	DT990--CON

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
Ethernet Output	Optional card

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

Simultaneous Maintenance, Control and Reporting

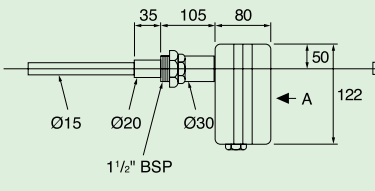
Control Unit Memory Type	Purpose	Storage Rate / Capacity	Typical Log Period for 8 Sensors
Long Term - included	Calculating Emission Averages (for reporting)	1 min - 2 hours 150k entries	204 Days (@ 15 minutes)
Short Term	Visibility to Process Trends	1 sec - 4 mins, 20k entries	20 hours (@ 30 seconds)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

Sensors

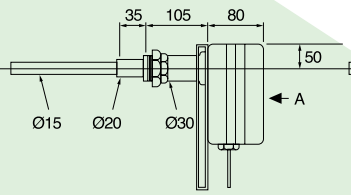
Sensors comprise both a sensor body and insulated or stainless sensor rods. The tables below show order codes for the sensor body and sensor rod, which must be specified seperately. Occasionally an additional air purge is fitted for very conductive applications.

Temp Range	For Rod Type	For Rod Diameter	Weight kg	Sensor Body Order Code
up to 250°C	316 Stainless	15mm	1.8	DT990--SEN0250P
up to 400°C	316 Stainless	15mm	1.8	DT990--SEN0400C
up to 250°C	Insulated (PTFE)	21mm	1.8	DT990--SEN0250I
up to 400°C	Insulated (Ceramic)	16mm	1.8	DT990--SEN0400I
up to 800°C	316 Stainless	15mm	1.8	DT990--SEN0800C

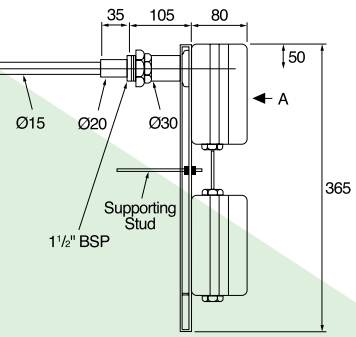
250˚C Sensor



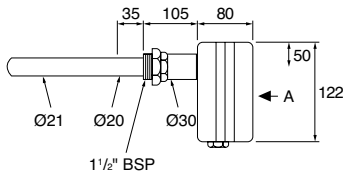
400˚C Stainless Sensor



800˚C Sensor



250˚C Insulated Sensor



The sensor rod material is either 316 stainless steel or for humid (eg process dryer) applications a patented insulated rod. To ensure representative measurement, the sensor rod is selected for a particular stackduct size (which should be specified). Typically the rod length is at least half the stack diameter.

Rod Order Code :
DT990 - - ROD x x x x X

- Rod Surface
  - S 316 stainless
  - P PTFE (insulated)
  - C Ceramic (Insulated)
- Rod Length in mm (eg 0500)

Stack/Duct Connection	1½" NPT or 1½" BSP socket
Ambient Temperature Rating	-25°C to +55°C
Enclosure Rating	IP65
Sensor Enclosure Material	Die-cast Aluminium (epoxy-coated)
Air Purge (optional)	DT990--AIRPURGE
Stack Pressure	>730PSI

Optional Components

Component	Purpose	Specification	Size (mm)
Cable	Power (+24VDC) and communication (RS-485) to sensors from control unit	4 conductor overall screened cable, diameter <0.8mm (Each conductor < 0.5mm^2 <50 ohm/km, and suitable for RS-485) Eg. Batt cables 85364	10m per sensor (included) Extendible to >1000m*
AIM (Analog Input Module)	Input data from external devices (eg Pressure Drop)	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
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
Analogue Output Module	Additional 4-20 mA	8 x 4-20 mA (500 ohms)	
Relay Output Module	Additional Relay	8 x Relay (1 Amp@250V)	
220 sensor	Broken bag detector (alarm only)	Temperature up to 125°C (250°C option)	½" BSP stack connector
DustReporter 2	PC Reporting software	Windows 95, 98 NT, XP	

About PCME

As a progressive environmental Company, PCME specializes 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. PCME-US is PCME's independent distribution partner for the US and is a division of B3 Systems.

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