DT991

Particulate Monitoring Systems

Electrodynamic AMS for Particulate Monitoring after Bagfilters

EN-14181 compliant

Automatic Monitoring System

for Particulate

QAL 1 CE

Certificate No: 9389

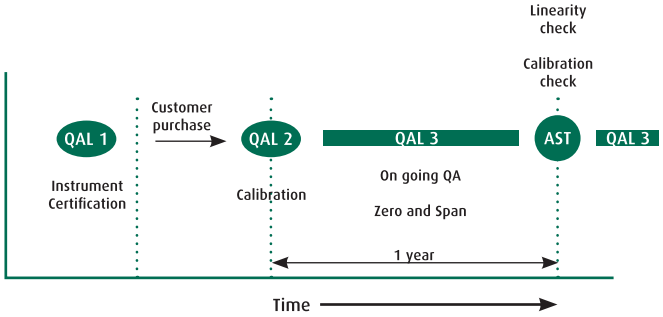
- Complies with new standards EN 13284-2/14181 applied to plants covered by "Waste Incineration" and 'Large Combustion Plant' EU directives
- Suitable for bagfilter applications with Emission Limit Value (ELV) of 10 mg^3/m^3 (Incineration) and 30 mg/m^3 (Co-incineration)
- Automatic recording of span and zero checks to satisfy QAL 3 requirements
- Optional test accessory to support linearity test according to AST
- Industrially hardened control unit with graphics interface and advanced configuration
- For non-bagfilter applications please refer to LMS181 data sheet

applications

EN-14181 (13284-2) for Incinerators, Cement Kiln (Co-Incinerators) and Power Plant

Industrial processes regulated under the European Waste Incineration Directive (WID) and Large Combustion Power Plant Directive (LCPD) must now apply the new standards EN-14181 (EN13284-2 for particulate). The DT991 provides a precise and robust solution to these requirements while reducing cost of ownership. Instrument standards require a QAL 1 assessment (with stated uncertainty) and suitable QAL 3 features for ongoing Quality Assurance (zero and span checks with appropriate statistical treatment).

The DT991 meets QAL 1, QAL 3 and AST requirements for constant processes controlled by Bagfilters. For non-Bagfilter applications, please refer to LMS181 datasheet.

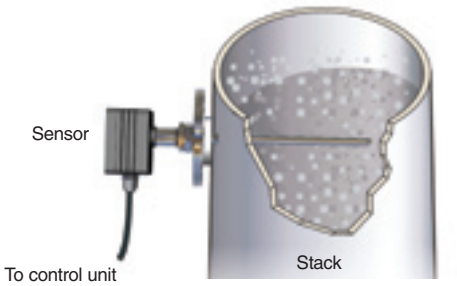


Principle of Operation and QAL2

The DT991 uses PCME's unique AC Electrodynamic technology, an advanced triboelectric method. The DC signal created by particles colliding with a probe inserted in a stack is electronically rejected, leaving an AC signal resulting from charged particles passing and interacting with the rod. Since the frequency signal has been specifically optimized (Electrodynamic technology), the instrument has reduced cross sensitivity to changing velocity and has increased stability even with dust build-up on the sensor rod. The dust signal is amplified, digitised and processed at the sensor, consistent with good signal to noise design techniques.

In constant processes using bagfilters (where typically particle-charging characteristics are constant), the processed signal can be correlated to dust concentration using a Standard Reference Method (SRM) according to a QAL2 calibration. In other applications the Correlation is process condition dependent: please ask PCME Ltd for advice.

The DT991 is provided as standard with a passive/active style sensor to avoid any problems caused by condensation in the stack flange connection stand off.



QAL1, QAL3 and AST features:

The DT991 is suitable for measuring particle emissions in processes regulated under the new standards EN-13284-2 and EN-141481. The instrument extends the measurement capability of PCME's already approved DT990 Electrodynamic instrument with features and performance to satisfy the new auditing and on-going quality assurance requirements derived from these new standards.

1) The instrument's automatic self-checks are extended to provide zero, span and contamination tests which assess uncertainty and to record results for later statistical analysis. This provides the infrastructure for QAL3 tests according to EN-14181.
2) Optional PC software 'QAL Reporter' provides secure emissions and QAL3 reporting. It includes the statistical treatment of the zero and span results for the user to demonstrate that the instrument is operating according to defined specifications (uncertainty).
3) An optional reference 'AST linearity tester' is provided as a test accessory to demonstrate linearity as required by the Annual Surveillance Test (AST).
4) The measurement and calibration features are extended to facilitate a 15 point/3 day calibration (QAL2) and permit the specification of a valid calibration range.

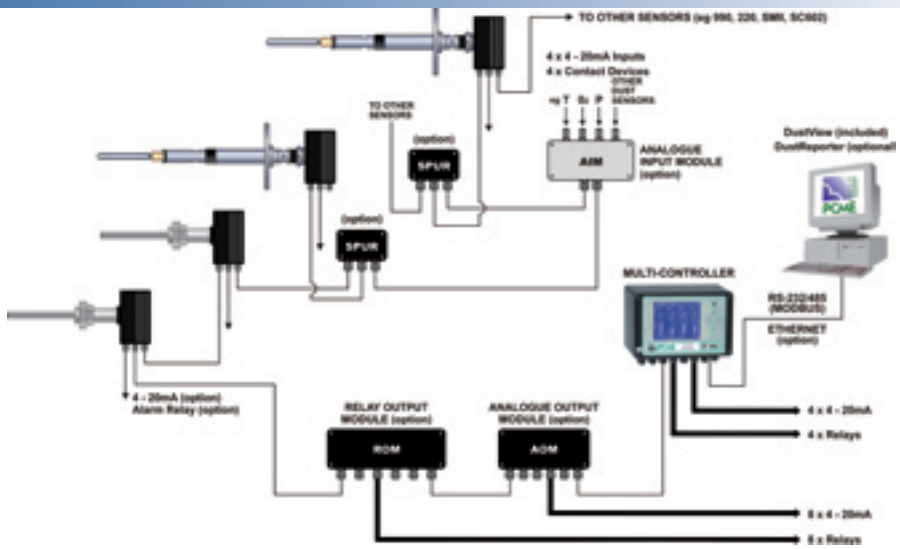
The DT991 is traceably derived from the DT990 which holds TUV BImSchV 17 approval for the certification ranges 0-15 mg/m^3. In the UK the DT991 also holds an MCERTS approval for the certification of 0-15 mg/m^3 which meets the QAL1 requirement for processes with a daily emission limit value as low as 10 mg/m^3. This makes it applicable to the limit value ranges of 10 mg/m^3 for Incineration plant and 30mg/m^3 for cement kilns (co-incineration processes).

Modbus registers, Ethernet as well as standard analogue outputs combine to offer a selection of options to extract data from the DT991 to assist direct integration into CEM systems.

product features

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, RS232/RS485 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) and MCERTS approved dust monitors (990 sensor) can be connected to the control unit.



Control Unit Features

- Displays instantaneous and average emissions (baragraph, text and on-line graph)
- Customisable '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 centralised 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)
- QA screen allowing 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 unit(s)

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

1 x Ethernet Output	Option for connection to LAN
4 x Isolated 4-20mA Outputs	Assignable to any channel
MODBUS RS485 & RS232 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 extension 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	L	Calculating Emission Averages (for reporting)	1 min - 2 hours, 150k entries	204 Days (@ 15 minutes)
Short Term	S	Visibility to Process Trends	1 sec - 4 mins, 20k entries	20 hours (@ 30 seconds)
Pulse	P	Locating Broken Bags	Optimised (13k entries)	25 minutes
Alarm Log	A	Log of all alarms	Instantaneous	1000 entries

specifications

Sensors

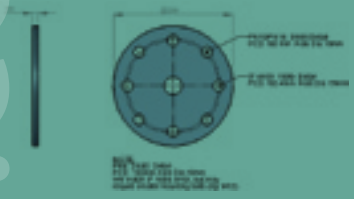
	Order Code	
Probe Type Standard	S	Passive/Active Style 316 Stainless Steel
Stack Diameter (mm)	D	Standard Probes for up to 3m Multiple Probes for stacks to 6m
Temperature Range (flue gas)	250 400	Up to 250°C (standard) Up to 400°C (optional)

	Order Code	
Local Outputs - standard - optional	N O	No Outputs 1 x 4-20mA/1 x Relay
Stack/Duct Connection		3" 150 ANSI Hole Pattern (see drg below)
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) Air Purge (optional)	N AP	

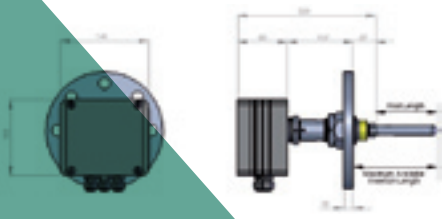
*probe contamination check not available

Physical Dimensions and Order Codes

3" ANSI/PN10/PN16 Flange



0-250ºC Non-Passive Sensor



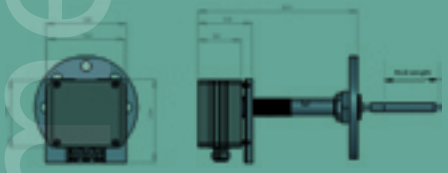
Sensor Order Code:

991S - X X X X X

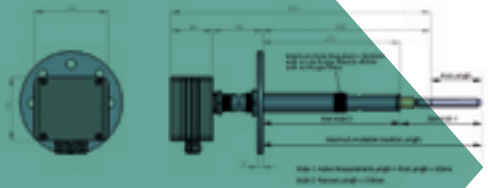
- Local Output (4-20mA + alarm)
- Temperature Range
- Stack Diameter
- Air Purge
- Probe Type

Control Unit Order Code: 991C

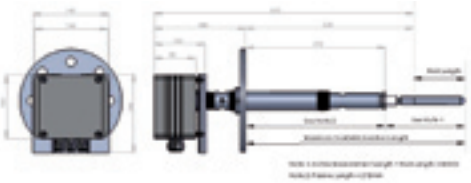
0-400ºC Non Passive Sensor



0-250ºC Passive Sensor



0-400ºC Passive Sensor



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 *
SPUR	Divides cable into 2 branches	3 cable connections	100 w x 66 h x 46 d
AIM (Analogue Input Module)	Input data from external devices (eg for Temp and 0_2)	4 x 4-20 mA inputs 4 x Digital Inputs (contact closure)	160 w x 80 h x 65 d
AOM (Analogue Output Module)	Additional 4-20mA outputs	8 x 4-20 mA outputs	175 w x 80 h x 60 d
ROM (Relay Output Module)	Additional relay outputs	8 x Relays	250 w x 60 h x 80 d
ATEX approved sysytem	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	222 w x 125 h x 81 d
220 Sensor	Broken bag detector	Temperature up to 250ºC	1 ½" BSP stack connector
990 Sensor	Dust Analyser	TUV/MCERTS approved	1 ½" BSP

* Can be extended further by use of additional PSU

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 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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