

# 4650-PM

PM-CEMS • PM-CPMS



● PS-11 Continuous Particulate Matter Measurement



**LAND**  
**AMETEK**<sup>®</sup>  
PROCESS & ANALYTICAL INSTRUMENTS

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QUALITY CUSTOMER SOLUTIONS

# 4650-PM

## AMETEK LAND HAS BEEN MANUFACTURING PRECISION MEASURING EQUIPMENT SINCE 1947.

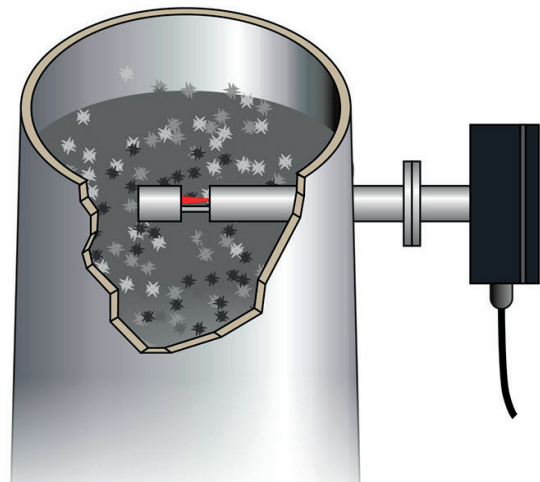
WE ARE SPECIALISTS IN NON-CONTACT TEMPERATURE MEASUREMENT AND COMBUSTION MONITORING WITH APPLICATIONS ACROSS DIVERSE INDUSTRIES SUCH AS STEEL AND GLASS MAKING, POWER GENERATION AND CEMENT MANUFACTURE.

As part of AMETEK Process & Analytical Instruments Division since 2006, our customers benefit from the worldwide AMETEK sales and service team.

### THE 4650-PM PROVIDES ACCURATE AND RELIABLE MEASUREMENT OF PARTICULATE MATTER.

The Model 4650-PM uses an improved forward scatter technique to measure particulate matter in stacks and ducts. It features an improved optical system and lower angle of incidence than competing systems, resulting in a lower detection limit and better stability.

The rugged and reliable design is ideal for applications in electricity generation, industrial boilers, glass, cement and metals. It can be installed after a baghouse or electrostatic precipitator.



#### FEATURES ▼

Large area collection optics  
Low angle forward-scatter measurement  
Wide measurement range  
No moving parts in measurement path  
Wide temperature range  
Built-in data log  
Regulatory compliance  
TCP-IP Ethernet, RS485, 4-20 mA outputs

#### BENEFITS ▼

Better detection limit  
Reduced sensitivity to particle size  
Measures concentrations from 0.01 to 200 mg/m<sup>3</sup>  
Highest stability and reliability  
Standard temperatures up to 250 °C (480 °F)  
High temperature option up to 500 °C (930 °F)  
Improved data security and troubleshooting  
EPA PS-11, MATS, Boiler MACT; can be used as PM-CEMS or PM-CPMS  
Maximum flexibility and connectivity

**THE MODEL 4650-PM IS A RUGGED, RELIABLE AND VERY ACCURATE PM-CEMS FOR APPLICATIONS WHERE CONDENSED WATER IS NOT PRESENT.**

# SPECIFICATION & DESIGN

## FORWARD SCATTER

As particles travel through the laser beam, they scatter light in all directions. The strongest scattering is in the forward direction.

## NO MOVING PARTS IN MEASUREMENT PATH

The optical path is fixed for maximum stability and reliability. The only moving part is the automatic calibration device.

## CALIBRATION CHECK

Automatic check of zero and upscale calibration.

## PM-CEMS OR PM-CPMS

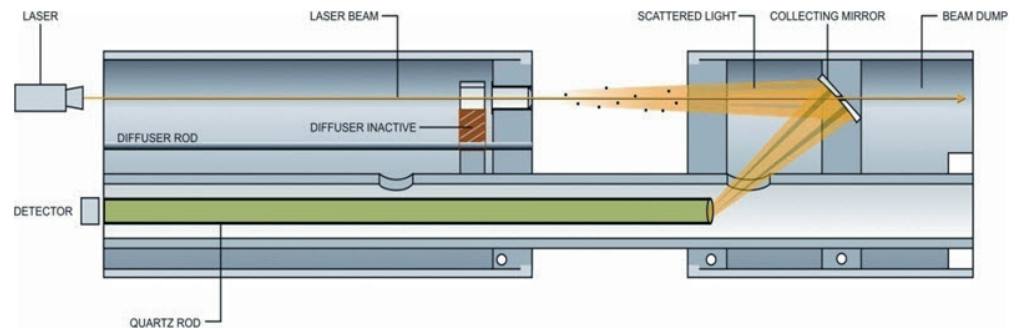
The 4650-PM can be used as either a continuous emissions monitor (PM-CEMS) or as a continuous parametric monitor (PM-CPMS).

## WIDE TEMPERATURE RANGE

There are no delicate components in the stack, so the Model 4560-PM can be used in temperatures up to 500 °C (930°F).

## CALIBRATION AUDIT

Filter audit units allow for periodic linearity checks.



TEMPERATURES UP TO 500 °C (930 °F)

## CONTROL UNITS

The Model 4650-PM comprises a stack-mounted probe and a separate control unit which provides power and communications as well as a user-interface.

Two control units are available. The Single controller supports one probe and has a single 4-20 mA output. The Multi controller supports multiple probes and provides four 4-20 mA outputs.



## APPLICATIONS

THE 4650-PM CAN BE USED TO MEASURE PM IN ALL COMBUSTION PROCESSES WHERE CONDENSED WATER IS NOT PRESENT

- Electricity Generating Units
- Industrial Boilers
- Glass Works
- Cement Plant
- Metals Refining
- Process Heaters

# 4650-PM

PM-CEMS

## SPECIFICATIONS

### Measuring Probe

<b>Measuring Technique:</b>	Forward-scatter Optical Detection
<b>Light Source:</b>	Diode Laser 650 nm. Class 3R
<b>Measurement Range:</b>	0-15mg / m <sup>3</sup> to 0-200 mg / m <sup>3</sup>
<b>Detection Limit:</b>	< 0.1 mg / m <sup>3</sup>
<b>Operating Temperature:</b>	-20 °C to 50 °C / -4 °F to 122 °F
<b>Max. Flue Gas Temperature:</b>	250 °C (480 °F) standard; 500 °C (930 °F) with high temperature option
<b>Insertion Depth:</b>	550 mm (21.7 in.)
<b>Stack Mounting Flange:</b>	DN80 PN10/16 or 3 in. 150 lb ANSI; minimum hole diameter 88 mm (3.5 in.)
<b>Materials:</b>	Enclosure: Powder-coated aluminum Probe: 316 stainless steel
<b>Air Purge:</b>	30 - 40 liter/minute (1.05 to 1.41 cfm)
<b>Sealing:</b>	IP66
<b>Power Supply:</b>	24 V DC provided by control unit
<b>Compliance:</b>	PS-11, 40 CFR 1040.10, 1040.11

Controller	Single	Multi
<b>Sensor Channels:</b>	1	Up to 16
<b>Display:</b>	Graphical Display	Graphical Display
<b>4-20 mA Outputs:</b>	1	4
<b>Filter Diagnostics:</b>	Pulse-log review	Pulse-log review
<b>Data Logs:</b>	Depends on log rate 7 days @ 1 minute	Depends on log rate 7 days @ 1 minute
<b>Ethernet:</b>	None	Included
<b>Outputs:</b>	1x RS485 Modbus	1x RS485 Modbus
<b>Size (H x W x D):</b>	8.7 in. x 4.8 in. x 3.2 in.	10.4 in. x 6.3 in. x 3.6 in.
<b>Power:</b>	100 - 240 V AC, 1 A	100 - 240 V AC, 1 A

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AND OPACITY  
MONITOR



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DISCOVER HOW OUR BROAD RANGE  
OF NON-CONTACT TEMPERATURE  
MEASUREMENT AND COMBUSTION &  
EMISSIONS PRODUCTS OFFER A  
SOLUTION FOR YOUR PROCESS

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