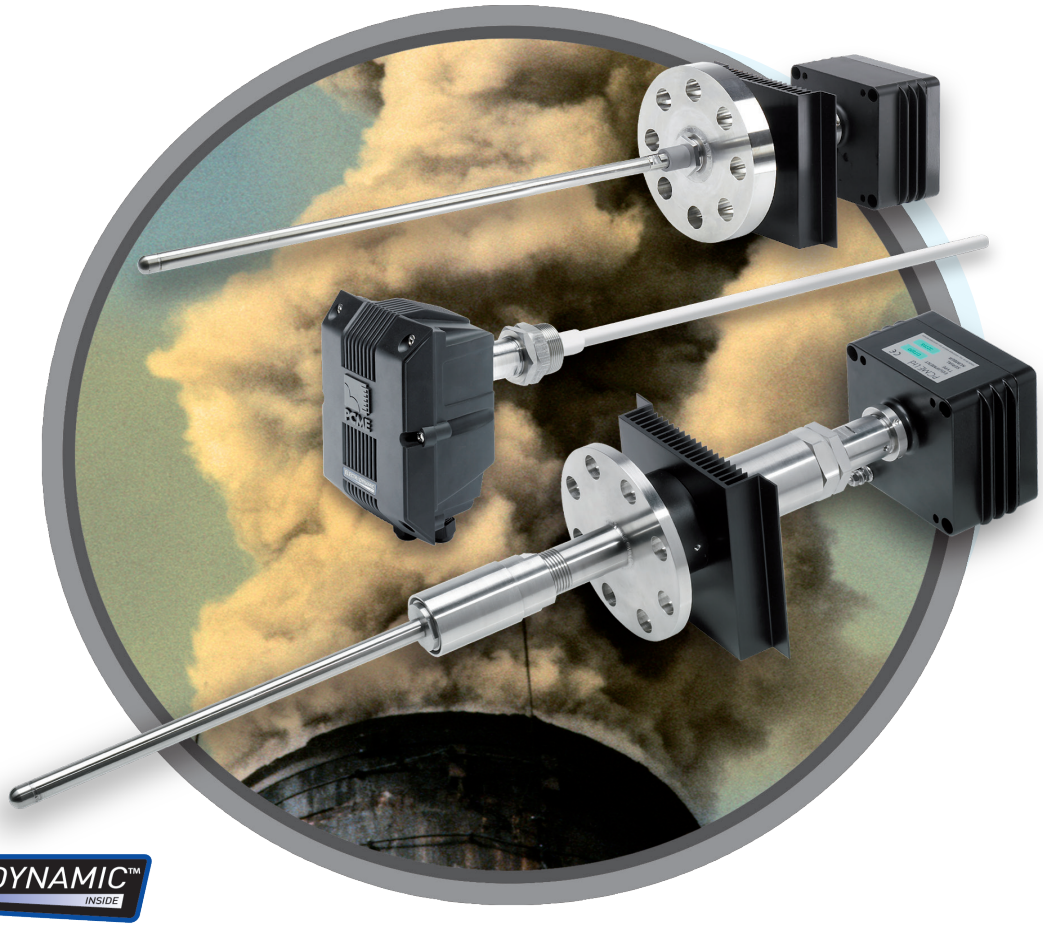
RUGGED SENSOR OPTIONS

Application Specific Sensor Options

PROCESS & EMISSIONS MONITORING SYSTEMS



ELECTRODYNAMIC™ INSIDE

SPECIFIC FEATURES:

- For extreme temperature processes and boilers with high sulphur content fuel
- For spray driers and applications with conductive dust and/or high dust loadings

THE QUEEN'S AWARDS FOR ENTERPRISE: 2017

For use in Challenging Stack Conditions

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CHALLENGING STACK CONDITIONS

ENVEA has developed a range of rugged sensor options for its probe electrification instruments. These enable ENVEA's Electrodynamic particulate measurement range of instruments to be used in some challenging industrial applications and combine the benefits of an Electrodynamic measurement of dust (application dependent) with long term robust operation.

The following sensor options and modules are available to provide solutions to:

· Elevated pressure and temperature applications
· Extreme temperatures (incineration)
· Acid attack protection (combustion of fuels with high sulphur content)
· Elevated temperature acid attack protection (as above with higher-temperature rating)
· High humidity applications (process and spray driers)
· Air purged sensor (conductive dust and high dust applications)
· Explosive dust and gas zones (ATEX and IECEx)

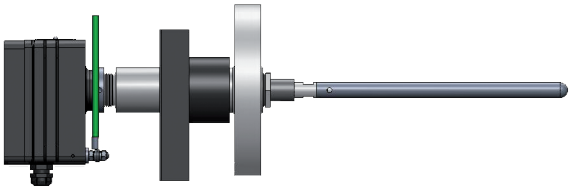
These solutions are available either as 'modules' which are stand alone components added to standard sensor, or 'options' in which the sensor is built to an alternative mechanical design.

ELEVATED PRESSURE AND TEMPERATURE OPTION

This sensor is rated to operate in processes with both high pressure and high temperature conditions (eg process reactors or coal gasification plant). The sensor is rated and tested for safe operation at pressures up to 50 atmospheres.

This sensor may also operate at stack connection temperatures of up to 350°C although since the stack connection location is often cooler than the stack gas temperature itself, higher temperature flue gas may be monitored.

Maximum Pressure	50 bar
Maximum stack connection temperature	350°C



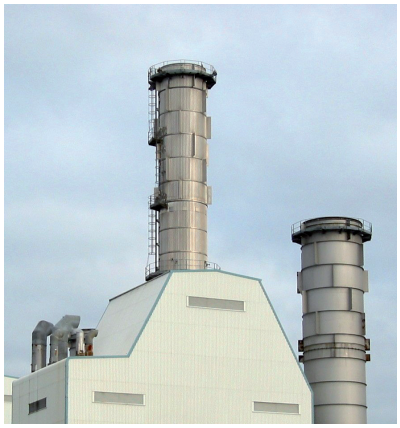
INSULATED SENSOR OPTIONS

The insulated sensor option (patented) is used to solve problems with insulator contamination which may otherwise occur in drier applications and processes with high levels of moisture (especially at plant shut down and start up conditions). In the insulated sensor, the PTFE insulator is extended over the complete length of the stainless steel rod core, meaning there is no path for moisture or conductive dust to bridge. This means the instrument can operate without problems and false signals caused by the insulator becoming electrically shorted (by the presence of moisture or wet dusts).

The insulated sensor may also be used in wet scrubbers to increase instrument reliability when the instrument is being used to monitor for changes in arrestment plant conditions. It should be noted that the insulated sensor does not reduce the sensitivity to any interference caused from water droplets. Electrodynamic systems like all other in-situ dust monitors are cross sensitive to water droplets, although unlike optical instruments are unaffected by steam.

ACID ATTACK PROTECTION MODULE

This sensor module provides acid protection for a standard Electrodynamic sensor (0- 250°C) from flue gas containing acid gas. It acts as a flanged sleeve into which the standard sensor in installed. All wetted parts are made from Hastalloy C and PEEK giving good protection against acid gases (particularly Sulphuric Acid) which may be formed if flue gas containing SO_2 falls below due point, condenses and combines with water condensate. This protection is of particular value at the base of the sensor where the sensor connects to the stack wall, since the flange stub is cooler than the stack itself and more susceptible to acid condensation.



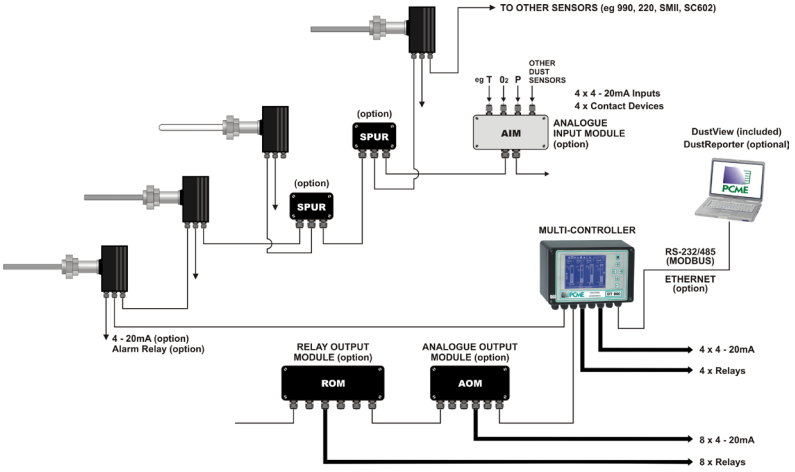
The module includes an air purge design (for connection to instrument air) which may be optionally used to overcome any problems with conductive dust contaminating the sensor insulator.

ACID ATTACK PROTECTION MODULE (HIGH TEMPERATURE)

This sensor option provides similar protection to the standard acid attack protection module while using insulator materials and seals which can tolerate the higher temperatures found in specialist high temperature boiler and drier applications.

MULTIPLE SENSORS FOR LARGE STACKS

Multiple electrodynamic sensor systems can be used as an alternative to cross stack optical instruments on large stacks. Multiple sensors are inserted in representative positions in the stack and their outputs are averaged in a central control unit.



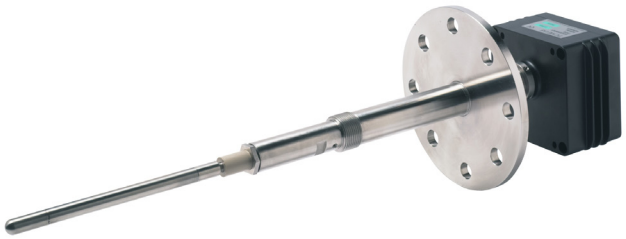
EXTREME TEMPERATURE OPTIONS

High temperature sensors are available for extreme temperature applications such as after furnaces, incinerators and ceramic filters. ENVEA has a range of temperature options which include the use of special rod materials to extend the temperature range above 800°C. Special insulators, seals and heat sinks are used in a range of high temperature range sensors to ensure reliable long term integrity of the critical sensor insulator and that all electronics and instrument components are kept below their rated operating temperature range.

RUGGED SENSOR OPTIONS

ACTIVE/PASSIVE OPTION

This sensor option enables Electrodynamic instruments to be used reliably in boiler, incinerator and drier applications with high flue gas water vapour. It overcomes problems caused by water condensation occurring within the stack connection stub or condensed water running down the inside stack wall. By extending the position of the active measurement part of the sensor rod and insulator into the stack away from the stack wall, these key parts of the instrument are removed from any area where water is present. This extends the periods between which the sensor insulator needs to be manually cleaned, hence reducing maintenance and increasing 'availability' of the dust instrument.



AIR PURGED SENSOR

The 'air purged' module permits a small curtain of instrument air to be continuously blown over the rod insulator to keep the insulator clean. This solution permits Electrodynamic instruments to operate in challenging applications such as carbon black and high loadings of moist or conductive dust. The air purge stops any insulator contamination occurring which might otherwise result in a change in the insulators electrical performance.

Most of ENVEA's high-end Electrodynamic instruments include automatic insulator contamination detection hence giving added Quality Assurance that the Insulator (whether using air purge or not) is working according to specification.

EX SOLUTIONS:

ENVEA have a range of category 1, 2 and 3 ATEX (and IECEx) approved instruments. Options of many standard instruments may be specified for Dust Zones 20, 21 and 22 and a separate range of intrinsically safe instruments is available for Gas Zones 0, 1 and 2.

ABOUT ENVEA

As a progressive environmental Company, ENVEA specialises in particulate measurement for industrial processes. With a worldwide reputation for reliability, innovation and technological excellence, the Company produces under the trademark envea™ 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.

Publication Part No.496023 v2 (12/20)

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