

# Extractive Particulate Measurement System

PROCESS & EMISSIONS MONITORING SYSTEMS

**PROSCATTER™**  
INSIDE



## SPECIFIC FEATURES:

- Second Generation compliance continuous particulate monitor, QAL1 certified against EN 15267-3 to meet EN 14181 and other International standards
- Extractive sampling probe with heated line configured for isokinetic or fixed velocity sampling
- Extractive system includes ProScatter® technology using a forward scatter PM sensor system
- Easy to use intuitive multi-lingual menu with large display for improved user interface complete with on-board diagnostics and multiple analogue and digital communication outputs

## COMPLIANCE WITH:

EN 14181, EN 13284-2, EN 15267-3, PS-11 (U.S. EPA)



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

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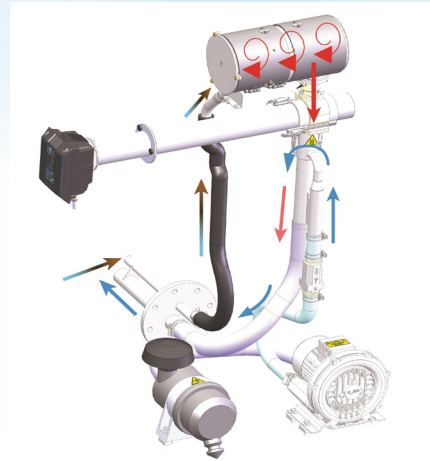
# TECHNOLOGY / APPLICATION

## SYSTEM DESCRIPTION

The QAL 182 WS is the second generation of wet flue gas particulate analysers which is built on the large success of the QAL 181 WS. Upgrades to enhance performance, reduce maintenance and manage ever more demanding process applications ensure the QAL 182 WS offers an unrivalled experience in wet flue gas monitoring.

This extractive approach, with heating, overcomes the problem of interference from condensation and water droplets when using an in-situ particulate monitor after wet FGD, wet ESP and wet SNCR scrubbing and filtration systems which produce a wet/condensing flue gas. Various sample probes are offered to ensure rugged operation in different flue gas conditions, e.g. below dew point, high acid, high temperature, high humidity with various lengths of sample probe to suit the stack fitting and design.

The system uses an advanced *ProScatter*® forward light scatter sensor. Both the system and the sensor are certified by TUV to EN 15267-3 with QAL1 as defined by EN 14181 with a certification range of 0-15 mg/m<sup>3</sup> or less (geographically dependent).



The QAL 182 WS utilises direct extractive heated sampling which can be configured to either extract an isokinetic sample or extract a sample based on a pre-set user-defined velocity. The extracted sample passes directly into a heated vaporising chamber. The sample is superheated and exits into a controlled sample chamber. The *ProScatter*® sensor provides a high accuracy, high resolution measurement meeting ELV's of 15mg/m<sup>3</sup> or less.

Due to the high volumes and large surface area transport system, opportunities for blocking is greatly reduced compared to Dilution systems.

The *ProScatter*® forward light scatter sensor minimising effects of changing particle type and refractive index of ferrous reduced sensitivity to variation of particle sizes.

The extracted sample velocity is measured and the speed of the air blower supplying the eductor is varied to reach either an isokinetic or pre-set sampling velocity. The extracted sample is then returned to the stack by the same sampling port.

The system setup, control and display of both the measured particulate and internal diagnostic values is provided by an intuitive, easy-to-use multilingual menu driven display complete with built-in data loggers for added security and an enhanced user experience, providing multiple analogue and digital outputs to PLC, DCS, Scada, and remote PC systems.

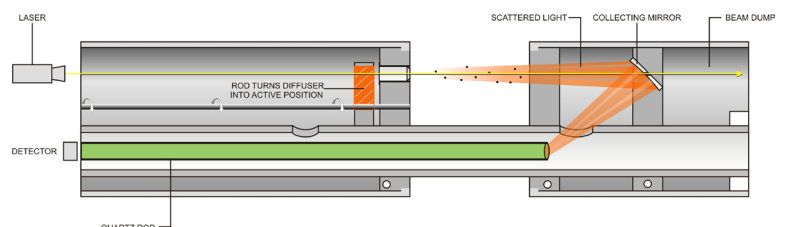
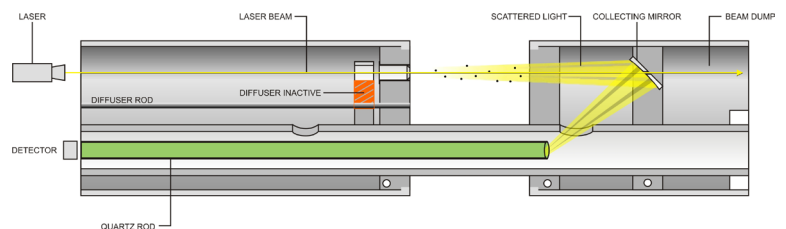
## INBUILT QUALITY ASSURANCE

The QAL 182 WS has automatic zero and span checks to ensure high quality measurement and continuous diagnostics on the sample and handling system to permit early diagnosis of any deterioration in system performance as required by governmental regulatory requirements through independent testing and certification systems, e.g. TUV, MCERTS, and other country certification programmes.

The automatic and inbuilt self-checks within the forward scatter sensor provide a full check of the instrument's capability to measure particulate matter accurately and verify the systems response to dust. Manual audit methods are also capable of being used to independently verify the systems response.

Various systems parameters are constantly monitored, e.g. flow rates, heater temperatures, system extraction rates, sensor system performance, sample line blockage directly and visibly reported to the operator for remedy.

The system has been designed to facilitate maintenance and cleaning of all major components which can be easily accessed and cleaned by opening the various covers. The inbuilt control system records measurements and internal parameters to facilitate easy diagnosis if any fault arises.



# PRODUCT FEATURES

## PROCESS AND APPLICATION CONDITIONS

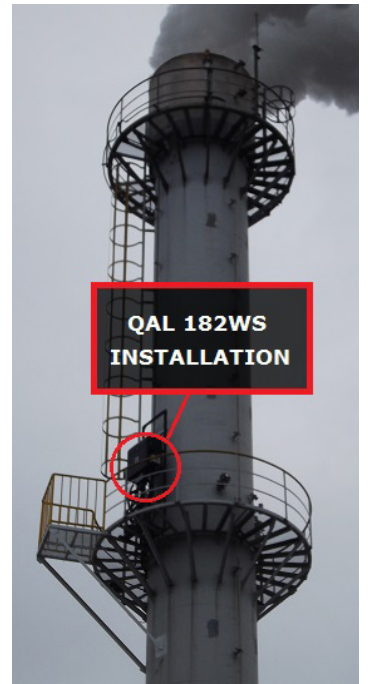
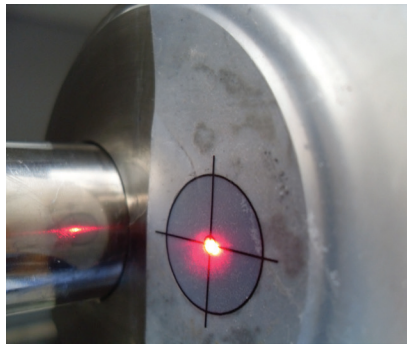
- Coal-fired power plants with wet FGD (with or without SCR/SNCR)
- Waste Incineration plants with wet scrubbing systems and Wet Electrostatic Precipitators – (WESPs)
- Pulp and Paper recovery boiler
- Metallurgical, Cement and Chemical processes fitted with Wet Scrubbers



## SERVICEABILITY

The system will provide reliable measurement of particle emissions in the aggressive environment of a wet stack, provided the system is correctly installed and commissioned and is appropriately maintained and cleaned.

Plant personnel should be trained for first line support of the system which can be undertaken through on-site or web-based training sessions through the various ENVEA global service centres worldwide.



## ADDED VALUE FEATURES AND BENEFITS

- Continuous direct sampling and measurement avoiding issues created by dilution and cyclic measurement systems
- Heated sampling to avoid cold spots which cause condensation and sample blockages
- Isokinetic or fixed velocity sampling methods
- Wide range of sampling velocities up to 30 m/s
- Low limit of detection <math>< 0.1 \text{ mg/m}^3</math>
- *ProScatter*® measuring technology offering reduced sensitivity to varying particle sizes, e.g. Fossil fuel power plant boilers
- Large volume sampling systems providing true isokinetic sampling capability
- High level of measurement confidence through inbuilt automatic zero and span checks that fully challenge the whole system
- Multiple analogue and digital outputs and inputs including: TCP/IP Ethernet, RS-485
- Powerful multilingual menu driven display and inbuilt data logging for recording of measured values and internal diagnostic parameters for enhanced user interface and improved security of data
- No moving parts in the measurement path for a rugged and reliable measurement

# SPECIFICATIONS

# PCME QAL 182 WS

## PERFORMANCE AND FUNCTIONALITY

Typical Measurement Range	Standard: 0 - 100+ mg/m <sup>3</sup> (for higher concentrations, please consult ENVEA)
Detection Limit	< 0.1 mg/m <sup>3</sup>
Flue Gas Temperature	Up to 180°C (for higher temperatures, please consult ENVEA)
Flue Gas Velocity	Up to 30 m/s

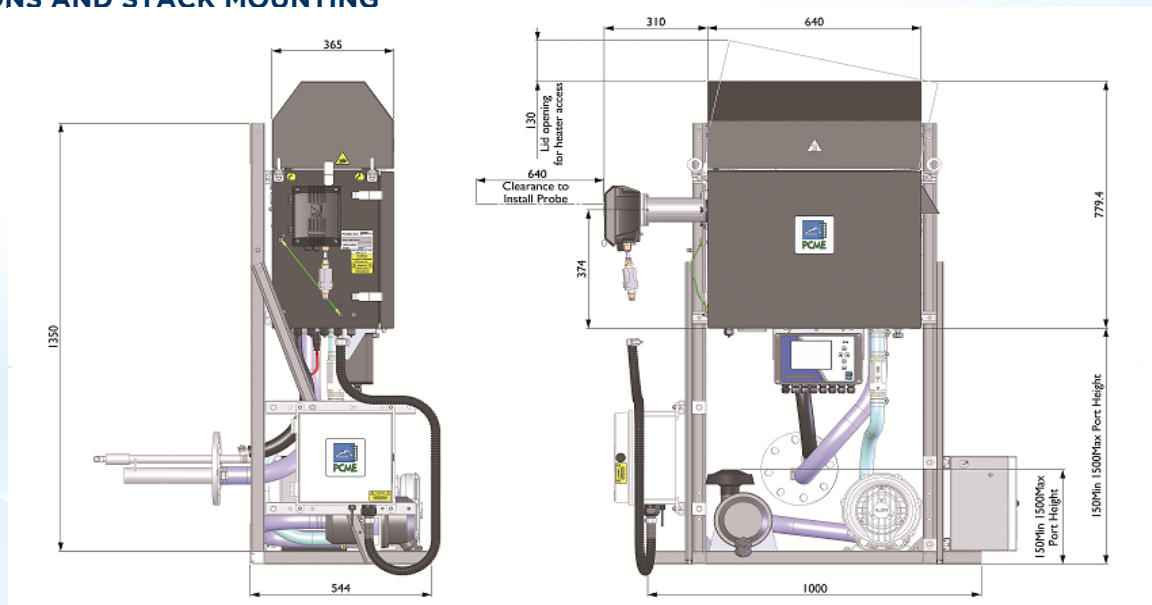
## SAMPLE PROBE

Probe lengths	600 mm 1200 mm (other lengths on request from ENVEA)
Material	PVDF (standard) corrosion resistant, maximum stack temperature 110°C Stainless Steel: non-corrosive stacks Hastelloy® corrosion resistant
Sample line length	1.7m between sample probe and analyser
Stack connection	4 in. 150 lb ANSI (PCD: 190.5 mm) DN100 PN10/16 (PCD: 180 mm) JIS 100-5k, 10k

## NETWORK ACCESSORIES

Analyser	Standard	Additional options
Power Supply	230V AC @ 3.2KW	110v AC @ 6.4KW
Interfaces	Modbus/RS485/RS232 4x 4-20 mA outputs 1x 4-20 mA input 4x Relay outputs 1x Relay input	Ethernet Additional relay Input/outputs  Additional 4-20mA Input/outputs
Data logs	Capacity stated for single sensor (plus self-check channels): <ul style="list-style-type: none"> <li>Total 19 channels LT</li> <li>Total 9 channels ST</li> <li>Total 9 channels Pulse</li> </ul> Long-Term 2 months @ 15 min Short-Term 3 days @ 1 min Pulse 14 hrs @ 1s Alarm 500 entries	PC-ME Dust Tools software for reporting on LAN or PC
User interface	Multi-lingual text driven menu and display	PC-ME Dust Tools PC software for data display and set-up and recording of instrument configuration

## DIMENSIONS AND STACK MOUNTING



## 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.



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