

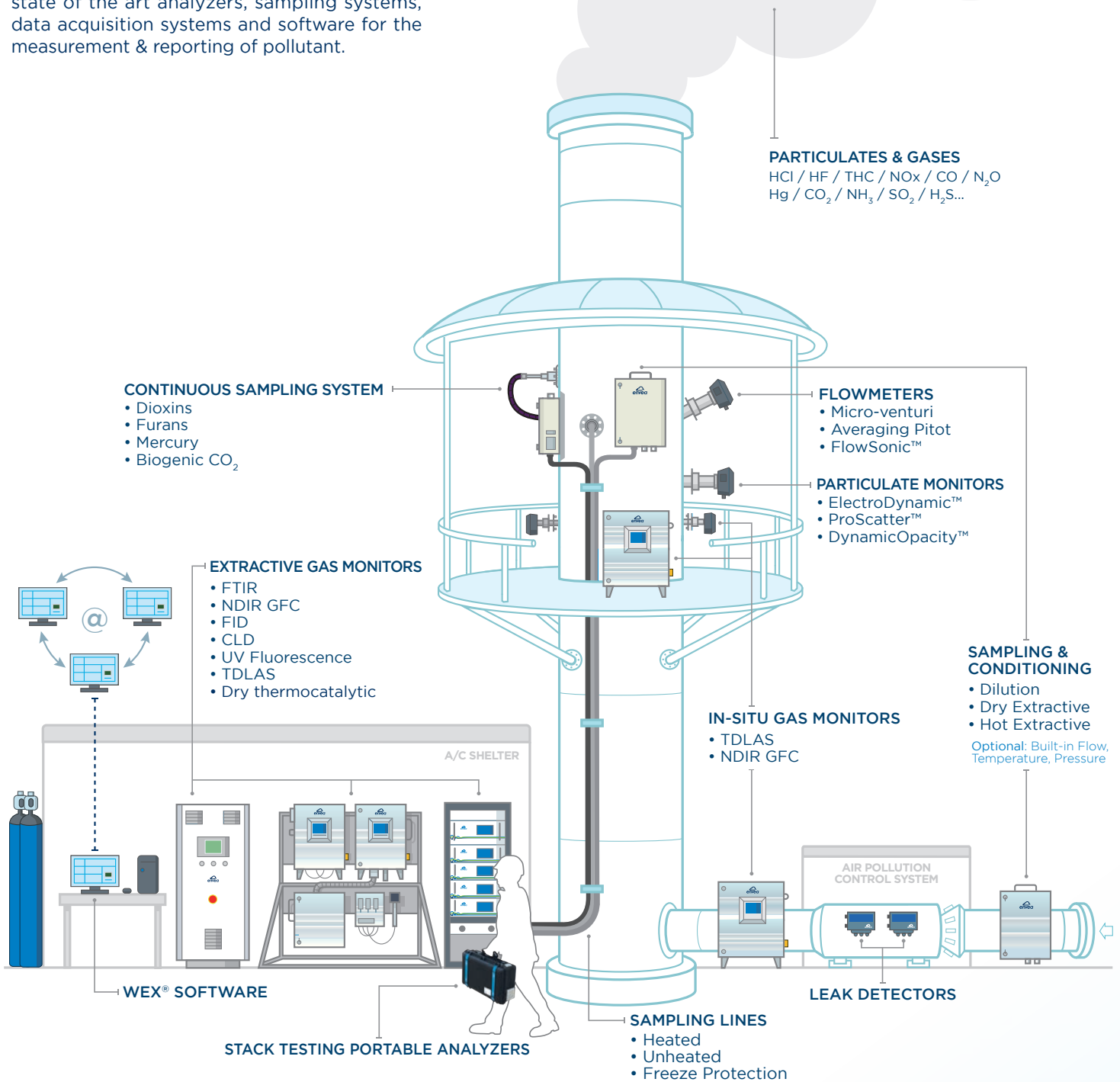
EMISSIONS

*CEMS (Continuous Emissions
Monitoring Solutions)*

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CEMS SOLUTIONS

We design and produce a complete range of state of the art analyzers, sampling systems, data acquisition systems and software for the measurement & reporting of pollutant.



With decades of industrial experience, our systems are designed and developed as a **complete turnkey solution**. From sample extraction, through analysis, data acquisition and report management, each system is configured to comply to the normative demands and technical constraints of our clients, regardless of the industrial domain:

- Waste-to-energy plants
- Combustion
- Power plants
- Gas turbines
- Biomass
- Glass industry
- Cement plants
- Pulp mills
- DeNOx (SNCR, SCR)
- Boilers & industrial furnaces
- Process control
- Metal, steel, petrochemical, chemical industries...

PRODUCT CERTIFICATIONS & APPROVALS

We offer a range of state of the art CEMS, tested and certified in order to ensure the highest level of performance and regulatory compliance for your processes.

Emission monitoring regulations vary from country to country, and the measurement technology must be assessed for suitability and in accordance with local requirements and standards. For instance, our solutions are fully compliant with the latest European regulations & standards:

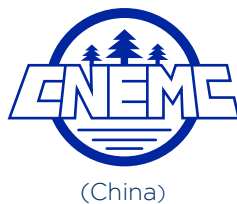
QAL1
EN 15267

QAL2
EN 14181

QAL3
EN 14181



Systems are also in accordance with EPA standards in the USA, as well as being approved and certified by various laboratories and organizations around the world such as:



CUSTOM DESIGN & ENGINEERING OF YOUR PROJECTS

We ensure the implementation of proven solutions that comply with regulatory requirements, improve environmental performances, and assist in reducing costs:

- Internationally certified and approved systems for regulatory markets
- Complete engineered solution from 3D drawings to assembly, testing & commissioning
- Established worldwide service and support structure through an exclusive distribution network of trained engineers and sales teams

In order to ensure maximum performance of the monitoring systems, you can also select personalized maintenance contracts, including various levels of QA/QC audits required by regulatory agencies.

Prior to installation, a Factory Acceptance Test (FAT) of the complete system is always carried out in order to ensure optimal implementation. After commissioning and installation, you can rely on our service team for all necessary support you may require:

PERFORMANCE TESTING

ON-SITE TRAINING

SPARE PARTS QUICK DELIVERY

TROUBLESHOOTING



Our commitment to your satisfaction goes on beyond on site installation

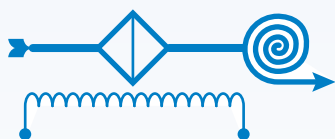
SAMPLING SYSTEMS

DIRECT EXTRACTIVE

A continuous extraction & transportation of the flue gas from the sampling point, performing necessary conditioning to meet analysis requirements, to the analyzer. There are two types of the direct extractive method:

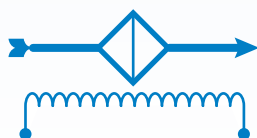
CD Cold Dry Extractive (Dry Basis Analysis)

The gas sample is extracted and conditioned before transport, in order to have all moisture and condensable components removed prior to its analysis. Upon arrival to the analyzer, the sample is clean, dry, at ambient temperature & water interference-free.



HW Hot Wet Extractive (Wet Basis Analysis)

The gas sample is extracted and transferred through heated sampling lines. It is heated above 180°C in order to avoid acid dew points for the analysis process. Upon arrival to the analyzer, the sample is hot and wet.



- Ideal for highly soluble gases; excellent in low concentrations
- Integrated back flush & calibration at sampling point
- Multi-component measurement possible
- Multi-stack with one analysis system possible
- Easy access to maintenance for all analyzers (*ground position*)

IS IN-SITU

This system is designed to continuously measurements & analyses, dust monitoring and/or gas emission, directly in the stack with or without sample extraction. The analyzer is installed at the sampling point. One of the main gas analysis technologies used is Tunable Diode Laser Absorption Spectroscopy (TDLAS).

There are two types of in-situ monitoring:

■ Cross-Stack – Analysis over entire stack diameter

A light source is sent across the interior diameter of the stack to a detector. The signal passes through the flue gas where it is then absorbed for measurement & analysis.

■ Probe – In-situ analysis

A probe, containing a part of or an entire measuring cell, is inserted into the stack at a precise point for measurements.

- Direct installation into the process / flue gas
- Fast response time (no measurement delays)
- Suitable for harsh conditions
- Reduced maintenance & operation costs
- No sample conditioning required

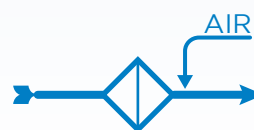
DIL DILUTION EXTRACTIVE

The flue gas is extracted, filtered & diluted with clean dry air, by an in-stack dilution probe, before being sent to the analyzer.

This technique lowers the flue gas dew point, keeping the sample temperature under ambient temperature, in order to eliminate all condensation issues (water interference-free). This also reduces the risk of contamination of the analyzer (low concentrations).

The dilution allows sample measurements in highly corrosive, dirty or high concentration conditions.

The diluted sample is transported in an unheated sample line to the analyzer. This reduces the overall cost of operation of the system.



- Suitable for explosion-proof applications (ATEX area) - no electric feed needed for probe & transfer line
- Allows long distance transfer (>150m)
- No chillers required
- Effective for low or high concentrations with IR-GFC (CO/CO₂), Chemiluminescence (NO_x), UV Fluorescence (SO₂), FID (THC)...
- Low maintenance sampling solution (continuous use for months without intervention or maintenance)
- Calibration gas injection allows full system calibration check
- Requires dedicated air clean-up panel to ensure clean dilution air

SA CONTINUOUS SAMPLING

Known volumes of flue gas are continuously extracted from stacks or ducts through a specific sorbent trap positioned in-stack or out-stack.

The AMESA samplers capture the target compounds within the flue gas. After analysis, it provides an average measurement of the targeted compound over the sampling period.

Sorbent Trap Sampling Systems are ideal for mercury, dioxins, furans & other POP's as well as biogenic carbon sampling.

- Continuous & automated sampling over a defined period
- Cost effective alternative compared to continuous monitors
- Ensures reliable results and at very low concentrations
- Direct in-stack or near stack sample capture
- No calibration or carrier gas required

The dry extractive SEC™ system dries the gas sample at the sampling point, eliminating the necessity of an expensive heated (180°C) sampling line.

Stack Gas Sampling System

The SEC™ BOX offers a sampling system that uses an exclusive high performance permeation drying technique, designed to meet almost all gas sample conditions. Ideal for highly soluble and corrosive gases.



- Sampling probe equipped with double stage particulate filtration
- Direct span gas injection for a complete system calibration
- Permeation-based drying system avoids loss of highly condensable gases (e.g. HCl, SO₂, NO₂ and HF)
- Automatic & periodic back-purge functionality for longer maintenance intervals
- Clean & dry sample transferred via unheated line (up to 100m distance) at ambient air temperature
- Large selection of probes available (depending on process conditions: stack diameter, gas temperature, water content, particulate concentration)
- Heated probe with choice of materials & lengths



Optional built-in temperature & velocity sensors or STACKFLOW 200 flow meter on the same flange

To be used with unheated analyzers such as MIR 9000, MIR 9000e, MIR 9000CLD

Heated Sampling System

The HOFI™ BOX offers an exclusive sampling system for heated analyzers. Ideal for corrosive gases.

- Double stage dust filtration
- Span and zero gas injection at sampling point
- Automatic back-flush function
- Sample transfer up to 50 m (clean & wet sample) by 140-180°C heated line
- Longer heated sampling line available
- Heated probe with choice of materials & lengths to suit application

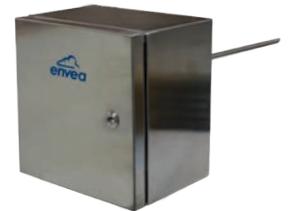


To be used with heated analyzers such as MIR FT, MIR 9000H, Graphite 52M et Topaze 32M

Heated Sampling System

The LCPD BOX is a full extractive sampling probe assembly which extracts the sample gas through a probe & heated filter to remove particulates.

- Stainless steel probe tube with optional reusable primary filter
- Corrosion resistant enclosure
- Temperature regulated heated block, containing zero-air / span gas connection & heated line connectors
- Check valve eliminates dead volume
- Large volume, quick-pulse blow-back
- Heated filter prevents condensation



To be used with heated analyzers, or with unheated analyzers such as MIR 9000, MIR 9000e, MIR-IS, by adding a cooling dryer

The Dilution System

Ideal for mid-high to high concentrations, also for sampling locations in hazardous areas (ATEX).

- Selectable sonic orifices allowing different dilution ratios (from 12:1 to 350:1)
- Sample transfer up to 150 m (diluted / clean & dry sample) by non-heated sampling line
- Fluid control unit for 1 to 4 Dilution probes
- Span gas injection at the sampling point
- Automatic back-flush function included
- Dilution probes available in different lengths & materials to suit sample conditions

To be used with low concentration analyzers (AC32e, CO12e, AF22e, HC51M) or MIR 9000

SAMPLING PROBES

- Wide range of sampling probes available depending on process conditions (humidity, temperature, dust concentration, stack diameter, etc.)
- Probes for SEC™ & HOFI™ boxes are available with the DTP Option (Temperature, flow rate and pressure measurement)



All our gas sampling systems can be used with dry or heated **MVS multiplexing solutions** (2 to 4 channels)

ONE STOP FOR COMPLETE ENVIRONMENTAL COMPLIANCE



EXTRACTIVE ANALYZERS



MIR 9000e

NDIR-GFC Multi-Gas Analyzer
(Non-Dispersive Infrared
Gas Filter Correlation)

Eco-designed, ultra-compact, smart & connected instrument, the MIR 9000e is your next tool to measure combustion exhaust gas from boiler, or gas emission from different industrial furnaces and process applications.

Superior metrological performances for the simultaneous multi-gas measurement of: NO_x, SO₂, CO, O₂, residual H₂O, and optionally CO₂, CH₄ and N₂O (greenhouse gases)

- Extremely compact (19"- 3U & only 33cm/13" depth), made for easy turnkey integration and seamless retrofit of most existing gas cabinets on the market
- Analyzer includes AMS control functionalities: sampling control, automatic zero and span gas injection, system alarms display, etc.
- Insensitive to T° variations in the range +5° to +40°C (no air conditioning required)
- Eco-designed, smart & connected, with ultra low power consumption
- Compatible with any type of drying technologies (gas cooler, permeation, dilution...)
- No compressed air required (if using a gas cooler)



H 483 mm (19")
L 133 mm (3U)
D 330 mm
KG 10,4 kg



	NO _x as NO ₂	N ₂ O	SO ₂	CO	CH ₄	H ₂ O (%)	CO ₂ (%)	O ₂ (%)
MIR 9000e	0-100 / 1500 / 5000	0-50 / 200 / 1000	0-75 / 1500 / 5000	0-75 / 3000 / 12500	0-50 / 200 / 1000	0-2	0-20 / 30	0-25

Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

MIR 9000P



Portable multi-gas analyzer, up to 8 simultaneous parameters

NO_x, SO₂, CO, CO₂, CH₄, N₂O, O₂ and residual H₂O. Accurate and extended measuring ranges

Compliant with international regulations. EN 15267-4 meets the highest European & US standards for Portable-Automated Measuring Systems

- Uses the non-dispersive infrared method (NDIR-GFC) with gas filter correlation
- O₂ is measured by a SRM built-in paramagnetic sensor (EN 15267-4 standard)
- Designed to meet the specific needs of stack testing applications
- Robust design: built-in vibration absorber ensures measurement cell protection and stability. High protection (IP 44) against water splashing from any direction
- Remote access to full operation thanks to ENVEA Connect™ App and onboard WiFi (smartphone alerts and notifications)



H 641 mm
L 393 mm
D 209 mm
KG 15 kg

45°C
IP44

	NO _x as NO ₂	NO _x as NO	N ₂ O	SO ₂	CO	CH ₄	H ₂ O (%)	CO ₂ (%)	O ₂ (%)
MIR 9000P	0-110 / 3000 / 5000	0-70 / 2000 / 3300	0-1000	0-141 / 1410 / 8500	0-60 / 3000 / 8000	0-70 / 700	0-2	0-20 / 30	0-10 / 25

Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

MIR 9000

Multi-Gas NDIR-GFC analyzer (Non-Dispersive Infrared Gas Filter Correlation)

Offers excellent performance for multi-gas measurements in dry sampling, including HCl, HF, NO, NO₂, N₂O, SO₂, CO, CH₄, TOC, CO₂ and O₂.



Available in 19" Rack or Tight box version

- Over 5 000 installations worldwide, covering various applications and industries
- Designed to measure dry & corrosive samples
- Fast & simultaneous measurements of up to 10 gases
- Dry basis measurement
- Automatic cross interference correction
- Compatible with high performance drying technologies, such as the SEC® box
- Intrinsic security with residual H₂O measurement
- On-board cell for O₂ measurement



	HCl	HF	NO	NO ₂	NOx	N ₂ O	SO ₂	CO	CH ₄	TOC	CO ₂ (%)	O ₂ (%)
MIR 9000	0-15 / 5000	0-20 / 300	0-100 / 5000	0-100 / 1000	0-200 / 5000	0-20 / 1000	0-75 / 5000	0-75 / 10000	0-10 / 1000	0-50 / 5000	0-10 / 100	0-10 / 25

Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

MIR 9000H

Heated Multi-Gas NDIR-GFC analyzer (Non-Dispersive Infrared Gas Filter Correlation)

Perfect multi-gas analyzer for the measurement in hot & wet sampling of: HCl, HF, NH₃, NO, NO₂, N₂O, SO₂, CO, H₂O, CO₂, O₂ and H₂O.

- Temperature maintained at 180°C from the sampling point to the measurement cell for no sample loss or composition changes
- Can be used to measure raw & purified flue gas for desulfurization / denitrification process control
- Designed to measure wet and corrosive samples
- Perfect analyzer for ammonia slip detection
- Robust design with a stainless steel tight box enclosure to withstand industrial environments
- No nitrogen required for calibration - can use clean & dry compressed air



	HCl	HF	NO	NO ₂	NOx	SO ₂	CO	NH ₃	H ₂ O (%)	CO ₂ (%)	O ₂ (%)
MIR 9000H	0-100 / 5000	0-40 / 300	0-200 / 5000	0-200 / 5000	0-200 / 5000	0-500 / 5000	0-75 / 10000	0-15 / 500	0-30 / 40	0-10 / 100	0-10 / 25

Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

MIR 9000 CLD

Multi-Gas IR-GFC analyzer (Infrared Gas Filter Correlation) - CLD option (Chemiluminescence Detector)

Standard Reference CLD method for low & ultra low NOx measurement, IR-GFC for CO, CO₂, SO₂, N₂O, HF, HCl, TOC and O₂ in a single analyzer.



- Designed to measure dry and corrosive samples
- Fast and simultaneous measurements of up to 10 gases
- Automatic CO₂ interference correction
- Intrinsic security with on-board residual H₂O measurements

MIR 9000 CLD - RACK

Chemiluminescence Multi-Gas Analyzer

MIR 9000 CLD-RACK uses the Chemiluminescence Detection technique CLD for low and ultra-low NOx monitoring.



- Incorporates optionally up to 3 monitoring technologies: CLD for low level NOx measurements, on-board cell for O₂ measurement & additional module for quenching corrections for CO₂ measures
- Compatible with various drying technologies such as a SEC sampling system or the high performance gas cooler

Lowest QAL 1 certified range for NOx/NO & NO₂ of the CEMS market: 20 mg/Nm³

	HCl	HF	NO	NO ₂	NOx	N ₂ O	SO ₂	CO	CH ₄	TOC	CO ₂ (%)	O ₂ (%)
MIR 9000 CLD	0-15 / 5000	0-25 / 300	0-20 / 2000	0-20 / 2000	0-20 / 2000	0-20 / 1000	0-75 / 5000	0-75 / 10000	0-10 / 1000	0-50 / 5000	0-10 / 100	0-10 / 25
MIR 9000 CLD RACK			0-20 / 2000	0-20 / 2000	0-20 / 2000						0-20	0-10 / 25

Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

MIR FT

Heated Fourier Transform Infrared Multi-Gas Analyzer

Based on the FTIR technology for simultaneous measurement of: HCl, HF, NH₃, NO, NO₂, N₂O, SO₂, CO, CH₄, TOC, H₂O, CO₂, O₂...

Fast and simultaneous measurements of up to 50 parameters, to be selected according to the application

- Heated sampling system and measurement cell (with HOFI sampling system) with temperature maintained at 180°C - ensuring no sample loss or composition changes
- Ideal for measuring trace concentrations in wet, corrosive gas streams
- Suited for hot wet measurements of soluble gases such as HCl, HF, NH₃, etc.
- All in one system including industrial PC & software for on-board data acquisition and processing



	HCl	HF	NO	NO ₂	NOx	N ₂ O	SO ₂	CO	CH ₄	TOC	NH ₃	H ₂ O (%)	CO ₂ (%)	O ₂ (%)
MIR FT	0-15 / 500	0-3 / 100	0-200 / 2000	0-200 / 2000	0-200 / 2000	0-100 / 500	0-75 / 20000	0-75 / 10000	0-15 / 1000	0-50 / 1000	0-15 / 500	0-30 / 40	0-10 / 30	0-10 / 25

Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

LAS 300 RK

Extractive Tunable Diode Laser Absorption Spectroscopy Analyzer

High precision measurements of selective compounds such as: HF, HCl, NH₃, O₂, NO, CO and H₂O. Other gases available upon request

- Uses rapid laser tuning and direct absorption spectroscopy in order to achieve very low detection
- Measurements performed at reduced pressure allowing specific measurements even in the presence of complex background gas mixtures
- Very robust low-volume multi-pass cell. Path-length unaffected by mirror reflectivity
- Hot / wet extractive, no sample drying or complex conditioning required, thus reducing ownership cost
- Free from cross-species interference



	HCl	HF	NH ₃	O ₂ (%)
LAS 300 RK	0-10/500	0-5	0-15	0-30

Lowest / Highest available ranges (others available upon request) expressed in ppm (or % when indicated)

TOPAZE 32M

Heated Chemiluminescence (CLD) Nitrogen Oxides Analyzer

Single reaction chamber version for the monitoring of NO or NOx, or dual chamber for NO, NOx and NO₂ measurements



- Heated analyzer (temperature controlled up to 180°C), measuring chamber under vacuum minimizing the quenching effect
- Designed to measure wet & corrosive samples
- Automatic CO₂ and H₂O quenching correction

We recommend the use of our unique temperature regulated heated line with stainless steel 2µm built-in sample filter and span gas injection function

	NOx	NO	NO ₂ (option)
TOPAZE 32M	0-10 / 10000	0-10 / 10000	0-10 / 10000

Lowest / Highest available ranges (others available upon request), expressed in mg/m³

GRAPHITE 52M

Heated Flame Ionization Detection (FID) Analyzer

One of the sole QAL 1 certified FID analyzers on the market, also available in a transportable version. Exists in 2 versions for the measurement of: THC or simultaneous THC, nmHC & CH₄



- All elements in contact with the sample from its extraction to the analysis are heated
- Adapted for checking the efficiency of a treatment process (upstream / downstream)
- Integrated zero air generator with catalyzer



	CH ₄	TOC
GRAPHITE 52M	0-10 / 10000	0-10 / 10000

DILUTION-BASED CEMS

Low-concentration “ambient air” analyzers, with innovative design & eco-friendly. The e-Series are known for:

- Sustainable eco-design (with no use of heavy metals)
 - Low carbon footprint
 - Over 95% of analyzer’s can be recycled
 - Ultra low power consumption
- Common electronic boards: optimized spare parts stock
 - Economic, easy & reduced maintenance
 - Interactivity: connected instruments
 - Step-by-step service assistant inside
 - Long lifetime, excellent accuracy
 - Color touchscreen display



example of e-Series monitor (AC32e)



ENVEA Connect™



The no-screen version of the analyzer avoids the pollution related to the screen manufacturing and recycling cycle:

The analyzer display is on your mobile device.

AF22e	CO12e	AC32e																						
<p><i>UV Fluorescence Sulfur Dioxide Analyzer</i></p> <p>Uses UV radiation to measure SO₂, with excellent performance, for a range from 0.4 ppb to 10 ppm</p> <ul style="list-style-type: none"> ▪ Option: module for H₂S/TRS monitoring (max 1 ppm), configuration for TRS measurements in CO₂ matrix 	<p><i>IR-GFC Carbon Monoxide Analyzer</i></p> <p>IR-GFC analyzer designed for high sensitivity monitoring of low CO concentrations in the range of 40 ppb to 300 ppm</p> <ul style="list-style-type: none"> ▪ Option: CO₂ measuring module (max 2000 ppm) 	<p><i>Chemiluminescence Nitrogen Oxides Analyzer</i></p> <p>CLD based analyzer offering superior metrological performances for NO, NO₂ and NO_x measurements in the range 0-1 ppm or 0-10 ppm</p>																						
<table border="1"> <thead> <tr> <th></th> <th>SO₂</th> <th>H₂S</th> <th>TRS</th> </tr> </thead> <tbody> <tr> <td>AF22e</td> <td>0-300 / 6000</td> <td>0 - 150</td> <td>0 - 150</td> </tr> </tbody> </table>		SO ₂	H ₂ S	TRS	AF22e	0-300 / 6000	0 - 150	0 - 150	<table border="1"> <thead> <tr> <th></th> <th>CO</th> <th>CO₂</th> </tr> </thead> <tbody> <tr> <td>CO12e</td> <td>0-300 / 6000</td> <td>0 - 20%</td> </tr> </tbody> </table>		CO	CO ₂	CO12e	0-300 / 6000	0 - 20%	<table border="1"> <thead> <tr> <th></th> <th>NO</th> <th>NO₂</th> <th>NO_x</th> </tr> </thead> <tbody> <tr> <td>AC32e</td> <td>0-150 / 3000</td> <td>0-200 / 4000</td> <td>0-200 / 4000</td> </tr> </tbody> </table>		NO	NO ₂	NO _x	AC32e	0-150 / 3000	0-200 / 4000	0-200 / 4000
	SO ₂	H ₂ S	TRS																					
AF22e	0-300 / 6000	0 - 150	0 - 150																					
	CO	CO ₂																						
CO12e	0-300 / 6000	0 - 20%																						
	NO	NO ₂	NO _x																					
AC32e	0-150 / 3000	0-200 / 4000	0-200 / 4000																					

Lowest / Highest available ranges based on 100/200 Dilution Rate (others ranges & dilution rates available upon request), expressed in mg/m³

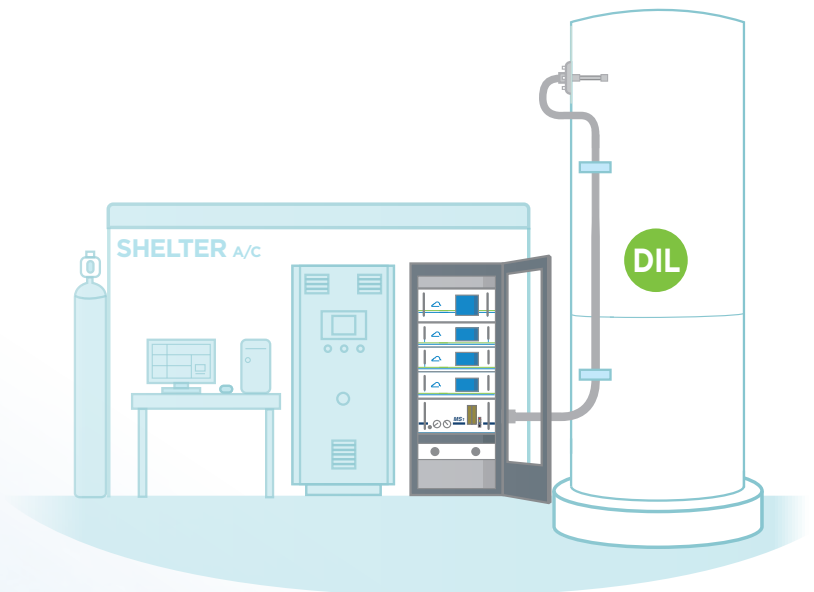
HC51M

Hydrocarbons / Total VOC FID Analyzer

Uses the principle of flame ionization detection to measure the concentration of hydrocarbons



- Available in 2 versions for the simultaneous & continuous measurements of:
 - THC (Total Hydrocarbons)
 - THC / CH₄ / nmHC (Total Hydrocarbons, methane & non-methane hydrocarbons)
- Real time calibration graph
- Full remote emulation of the analyzer
- User programmable ranges & average times

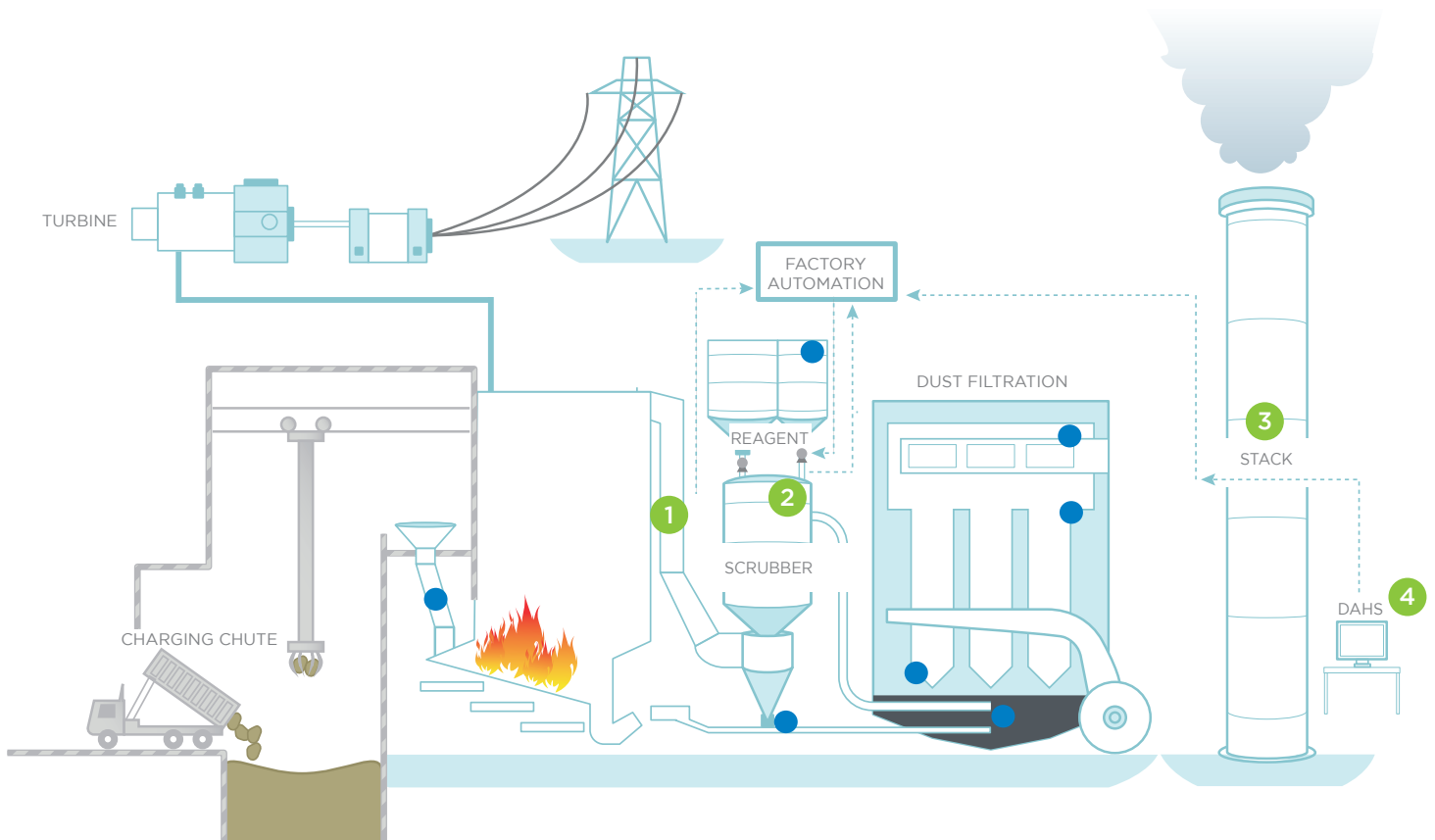


Selected gas analyzers receive diluted sample from in-stack dilution probe DIL-1 / MS-1

	CH ₄	THC	nmHC
HC51M	0-150 / 3500	0-400 / 4000	0-400 / 4000

Lowest / Highest available ranges based on 100/200 Dilution Rate (others ranges & dilution rates available upon request), expressed in mg/m³

A GLOBAL SOLUTION FOR MERCURY MONITORING



- 1** Continuous measurement of mercury in raw gases, upstream of exhaust treatments
 - Specific analyzer adapted to the process conditions offering a very high sensitivity on a very wide range of measurements
- 2** Continuous monitoring of reagent injection rates
 - Real time control of the quantities being injected
- 3** Continuous measurement of stack mercury emissions
 - Very low concentration measurement
 - QAL 1 certification according to the EN 15267-3
- 4** Optimisation and control of the whole flue gas conditioning process with the use of ENVEA's WEX™
 - Real-time monitoring of parameters, overruns & calculated means / Trends / Emission Limit Value (ELV) exceedance detection / Reporting...

These 4 key points treated as a whole allow a real optimization of the process and a high level of reliability in controlling atmospheric emissions. They also lead to significant environmental and economic benefits by limiting the quantity of chemical reagent and sorbent used.

The saturation phases of the flue gas treatment could be eliminated or at least minimized by using a regulation of the injection rate of the adsorbent product. Based on a continuous measurement of mercury upstream, this will allow a better reactivity and a real time adaptation to the process conditions.

MERCURY CEMS SM-5

- QAL 1 certification range 0-5 $\mu\text{g}/\text{m}^3$, the lowest on the market
- Additional ranges: 0-30 ; 0-45 ; 0-100 ; 0-1000 $\mu\text{g}/\text{m}^3$
- Very high accuracy: $<0,1 \mu\text{g}/\text{Nm}^3$ over 3 months
- Dynamic range switching for reliable measurement of mercury peak emissions
- Photometric measurement independent of the high-temperature converter to ensure very low maintenance times and costs
- Catalyst-free converter oven: no consumables required, minimal operating costs
- High temperature conversion method: **requires no reagent**, water refill or cartridge replacement
- Modular mercury injection system at the probe or at the analyzer for complete AMS checks
- Probe head port for optionally connecting a calibration system
- No need for carrier gas, dilution or air conditioning
- Fully heated sampling system to avoid mercury retention in the probe
- Sampling box mounted directly on the stack: no maintenance required and no transport of reactive Hg
- Two different power sources (protected/unprotected) in order to separate and secure the measuring system

Main applications:

- Waste incineration plants
- Coal-fired power plants (before and after mercury absorbers)
- Cement kilns
- Determination of mercury at sulphur acid production plants
- Thermal treatment of contaminated soils, special waste, etc.
- Metallurgical plants with potential mercury emissions...



FEATURES	BENEFITS
Very low certification range	High measurement accuracy
Instrument certified to operate without calibration	Reliability & reduced operating costs
Simple and robust design	Easy servicing with low maintenance costs
Converter oven without catalyst	Requires no consumables, minimized operating costs
Very low instrument air consumption	Lower operating costs
Customizable heated sample line	Remote installation for easy access to the analysis cabinet
Measurement of mercury in raw gases	Anticipates mercury peaks, optimizes the quantity of reagents injected and reduces costs
Over 20 years of expertise in mercury analysis	Guarantee of a high quality and high performance product

	Hg
SM-5	0 - 5 / 0-30 ; 0-45 ; 0-100 ; 0-1000
SM-4	0-10 / 500 (option 0-1000)

Lowest / highest ranges available, expressed in $\mu\text{g}/\text{m}^3$
(other ranges on request)

IN-SITU ANALYZERS

MIR IS

Close-coupled Multi-Gas Infrared Gas Filter Correlation Analyzer

A complete “all in one compact” system, for multi-gas measurements, based on the field-proven MIR 9000 analyzer and on-board SEC sampling system.

- Fast & simultaneous measurement of up to 10 gases among: HCl, NO, NO₂ (NO_x), SO₂, CO, CO₂, HC, CH₄ (TOC), HF, N₂O, O₂, at the sampling location
- Robust analyzer with a stainless steel enclosure
- Designed for measuring wet & corrosive samples
- Integrated sample drying & system conditioning no sample line necessary
- Ease of installation (single stack entry, on-stack or close-coupled) for reduced costs
- Flow, Temperature & Pressure parameters (optional)



	HCl	HF	NO	NO ₂	NO _x	N ₂ O	SO ₂	CO	CH ₄	TOC	CO ₂ (%)	O ₂ (%)
MIR IS	0-15 / 5000	0-20 / 300	0-100 / 5000	0-100 / 1000	0-200 / 5000	0-20 / 1000	0-75 / 5000	0-75 / 10000	0-10 / 1000	0-50 / 5000	0-10 / 100	0-10 / 25

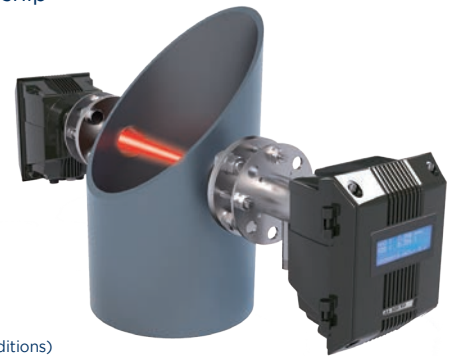
Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

LAS 300 XD

Cross-Duct Tunable Diode Laser Absorption Spectrometry Analyzer

Tunable diode laser absorption spectroscopy (TDLAS) is ideal for a selective measurement of some gas components such as NH₃, HCl, HF or even O₂, especially when conditions are too rough for standard O₂ Zirconia In-Situ analyzers.

- Suitable for harsh environment; sensor unaffected by contaminants (no corrosion)
- Absence of extractive conditioning: eliminates errors related to sample handling
- Absolute measurements: no drift, no calibration, linear response
- Very low maintenance, low cost of ownership
- In-situ & non-invasive (optical technique)
- Interference free gas measurements
- Large dynamic range



	NH ₃ & H ₂ O	HCl & H ₂ O	HF	O ₂	CO
LAS 300 XD	0-15 / 500 & 0-50%	0-10 / 3000 & 0-50%	0-100	0-10% / 100%	Low: 0-500 High: 0-100%

Lowest / Highest available ranges expressed in ppm (or % when indicated)
Ranges indicated vary with installation conditions (indicated ranges for 1 m path-line at standard temperature and pressure conditions)



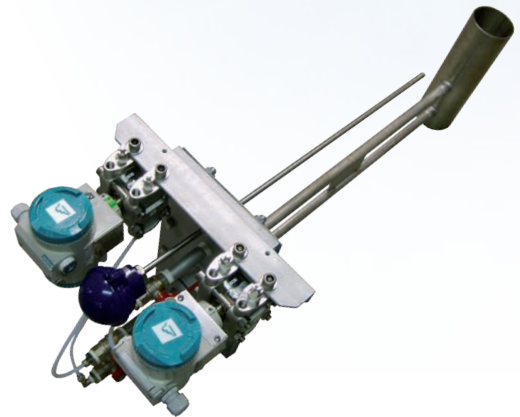
FLOW METERS

STACKFLOW 100

Micro-Venturi technology

The STACKFLOW 100 is a compact Micro-Venturi flow meter for Velocity, Temperature and Pressure (VTP) measurements

- Can be used for stack diameters >300mm
- Fouling without effect on the measurement: no need for back-blowing
- Optional inbuilt gas sampling port for CEMS integration
- Different probe lengths for improved sample representativity & to fit the application
- Standalone sensor or combined with single/multi-channel controllers for enhanced user interface, cost-effective & ease of integration
- Handles stack temperatures up to 400°C



	Velocity
STACKFLOW 100	5 - 30 m/s

A probe made up of a micro-venturi tube and temperature sensor. A measuring unit holding static and differential gas pressure sensors.

STACKFLOW 200

Averaging Pitot technology

The STACKFLOW 200 uses the well established Averaging Pitot technology to provide continuous flue gas VTP measurement to meet regulatory requirements



Probe available in different lengths (0.5 m, 1 m and 1.5 m)

- Fitted on single point installation, making on-site work easier for set-up & maintenance
- Automatic inlet cleaning cycle for reduced maintenance
- Optional inbuilt gas sampling port allows cost-effective CEMS integration on a single sampling point
- Integrated flange for enhanced stack connection compatibility and reduced installation time & costs
- Standalone sensor or combined with single/multi-channel controllers for enhanced user interface
- Optional high-pressure back-purge system for challenging applications

	Velocity
STACKFLOW 200	2 - 30 m/s (2 - 50 m/s)

STACKFLOW 400

Ultrasonic Flow technology

The STACKFLOW 400 is an advanced flue gas flow measurement system for continuous monitoring of industrial sources.

- Unique extended measurement path (400mm) permits accurate & increased representative measurements
- Facilitates stack velocity, volumetric flow, temperature and pollutant mass release calculations when linked to gas & dust
- Robust flow measurement for industrial applications
- Angled probe version to fit existing perpendicular ports
- Built-in automatic span self-checks for regulatory compliance (QAL 3)



	Velocity
STACKFLOW 400	0 - 30 m/s (0 - 50 m/s)

Sensor available in 2 different forms (straight or angled) for both horizontal & vertical stacks to adapt to your needs

PARTICULATE CEMS MONITORS

QAL 181

Forward ProScatter™ technology

Suitable for measuring low and high particulate concentration levels after both bag-filter and electrostatic precipitator arrestment plant.



- Forward scatter technology provides improved measurement due to reduced cross-sensitivity in particle type & size
- Robust & rugged for challenging temperature stack conditions (optional to 500°C) and ex-hazardous zones
- Forward Scatter measurement technique with automatic zero logging & span self-checks (QAL 3)

	PM
QAL 181	0-1 000 mg/m ³

QAL 182 WS

Forward ProScatter™ technology

Gas particulate analyzer for emissions from wet scrubbers, especially suitable for applications after wet FGD (flue gas desulfurization) as found on coal fired power stations.



- Higher durability with composite material
- Highly sensitive (<0.1 mg/m³) particulate concentrations in wet flue conditions
- System self-checks with logging of Zero & Span check data for QAL 3 reporting, manual audit functionality
- Isokinetic sampling with automatic adjustment (option)

	PM
QAL 182 WS	0-500 mg/m ³

STACK 710

LED Opacity Measurement Technique

The STACK 710 is a cross stack Continuous Opacity Monitoring System (COMS).



- Light extinction used to determine optical density & emission concentrations
- “No moving parts” optical system offering reliability & proven low level measurement capability beyond most standard opacity monitors.
- For dry applications with flue gas temperature max at 600°C
- The transceiver houses the optical and electro-optic components.
 - Flood LED used for highest levels of accuracy & stability
 - A homogeneous pulsed LED source
- Automatic in-situ zero & span check

	Opacity (%)	PM
STACK 710	0-10 / 0-100	0-15 mg/m ³

QAL 991

ElectroDynamic™ Probe Electrification technology

The QAL 991 is ideally suited to low emission monitoring with high quality with its patented technology.



- Suitable for bag-filter applications with ELV of 10 mg/m³ (Incineration) & 30 mg/m³ (Co-incineration)
- Upgradeable to include control for up to 16 sensors plus additional 16 calculated channels (e.g. Mass)
- Advanced sensor design includes zero, span & unique contamination checks (QAL 3)
- Rugged operation and advanced diagnostics capability for managing the operation of bag-filter arrestment plant

	PM
QAL 991	0 - 1000 mg/m ³

QAL 260 / QAL 360

Backward ProScatter™ technology

A non-intrusive particulate monitor series used for dust concentration measurements in combustion, incineration and other industrial stacks (Power, Cement & Metal Smelting Processes).



Audit Unit and Attenuator (Optional)

- With single side stack installation, it can be used at low or high dust levels
- Automatic Functionality check: fully interrogates optical systems
- Designed to operate in non-condensing stack environments and to overcome acid & dew point issues
- Laser Backscattering technology (light backscattering); detection limit <1 mg/m³

	PM
QAL 260	0 - 500 mg/m ³
QAL 360	0 - 500 mg/m ³

MERCURY, DIOXINS, FURANS & BIOGENIC CO₂ SAMPLERS



Sampling unit
AMESA

AMESA-D®

Dioxins & Furans

The AMESA-D utilizes the water cooled probe method with Isokinetic sampling system coupled with XAD-II adsorbent cartridge for Long-term sampling of dioxins (PCDD), furans (PCDF) and other persistent organic contaminant (POPs).

- Isokinetic sampling by a built-in Pitot tube on the sampling probe
- Automatic continuous sampling from 4 hours to 6 weeks (programmable)
- Adsorption on exclusive XAD-II cartridge
- Dioxins of all 3 phases (gaseous, solid and liquid bounded) are collected in one cartridge
- High efficient dust filter
- Fully automated and sampling operating conditions storage
- Cooled probe composed of different materials and lengths to fit the application



AMESA
Control unit

I-TEQ (TÜV)

AMESA-D 0 - 0.5 ng/m³

AMESA-B®

Continuous monitoring of Biogenic CO₂ emissions

The AMESA-B uses a CO₂ sampling method on an adsorber cartridge filled with Ascarite or soda lime, to determine the biogenic fraction of CO₂ emissions.

Biogenic or carbon-neutral stack CO₂ gas can be deductible from any company's greenhouse gas inventory which is required for reporting under various regulations.

- Sampling period between several hours and 1 month
- Allows to determine the ratio of biogenic and fossil-derived CO₂ by C¹⁴ dating measurement

Applicable to waste-to-energy, electricity generation, coal co-firing, steel, cement and lime processes to quantify their biogenic CO₂ emissions as CO₂ neutral, for regulatory compliance:

- Cost savings for operator
- CO₂ emission trading
- Helps governments demonstrate green energy policy



Available in
2 formats

pMC (percent Modern Carbon)

AMESA-B 0 - 100 %

AMESA-M®

Mercury Sorbent Trap System

The AMESA-M's independent stand-alone design is based on experience gained with the AMESA-D dioxin sampler. It uses similar technology with a smaller, simplified design that is more cost-effective for Mercury Monitoring.

- Sorbent Trap Monitoring System (STMS according to US-Environmental Protection Agency (EPA) performance standard 12B
- Extracts a part of the flue-gas through a heated sampling probe
- Sampling of mercury on paired sorbent traps (for QA purposes, as required by regulations)
- Fully automatic sampling between 30 minutes and 4 weeks
- Storage of operating data protocol
- The AMESA-M system has a fully functional HMI at the probe.
- All system parts are installed in an IP54 enclosure (wall-mounted / cabinet version)

Hg
AMESA-M 0 - 10 / 10000 µg/m³

ACQUISITION & REGULATORY REPORTING

WEX™

MCERTs CERTIFIED SOFTWARE FOR ACQUISITION & REPORTING

Data acquisition is vital to the functionality of a Continuous Emissions Monitoring System (CEMS). As well as providing real time reports and data handling, the purpose of data acquisition and reporting software is to provide adherence to legislative compliance. It also ensures that the CEMS equipment is running at its fullest capabilities, eliminating the risk of excess emissions.

WEX™ collects and processes environmental data for display, management and reporting purposes and has been designed to meet the requirements of EN14181 and MCERTs certified Environmental Data Management Software requirements for Environmental and Continuous Emissions Monitoring reporting systems.



Compliant with international guidelines and standards:

- EN 14181 (QAL 1, QAL 2, QAL 3)
- Industrial Emission Directive (IED) n° 2010/75/EU
- Large Combustion Plant Directive (LCPD) n° 2001/80/EC
- Medium Combustion Plant Directive (MCP)
- Waste Incineration Directive (WID) n° 2000/76/CE
- ISO 8258 (Shewart)
- NFX06-031-3 (EWMA)
- NFX06-031-4 (CUSUM)
- US EPA
- ...



Adjustable to any plant size and managing various data sources: emission, imission, meteorological, water & process, WEX™ is designed to be highly reliable and suitable for your regulatory compliance.

DATA ACQUISITION

WEX™ acquires data in real-time, from **multiple sources**, over 250 protocols of communication including MODBUS, OPC... Data can be stored (raw & validated) for over 10 years.

The software **calculates** (scaling, correction, linearization, normalization) and aggregates the resulting data over different time periods.

DSC connection is available for communication with all equipment (MODBUS, OPC...).

BACK-UP SYSTEM

An **automatic & permanent back-up** of the software system is available on a separate CPU (optional). In case of failure on the main system, it automatically switches to the back-up, providing the exact same possibilities for acquisition & processing with **no data loss**.

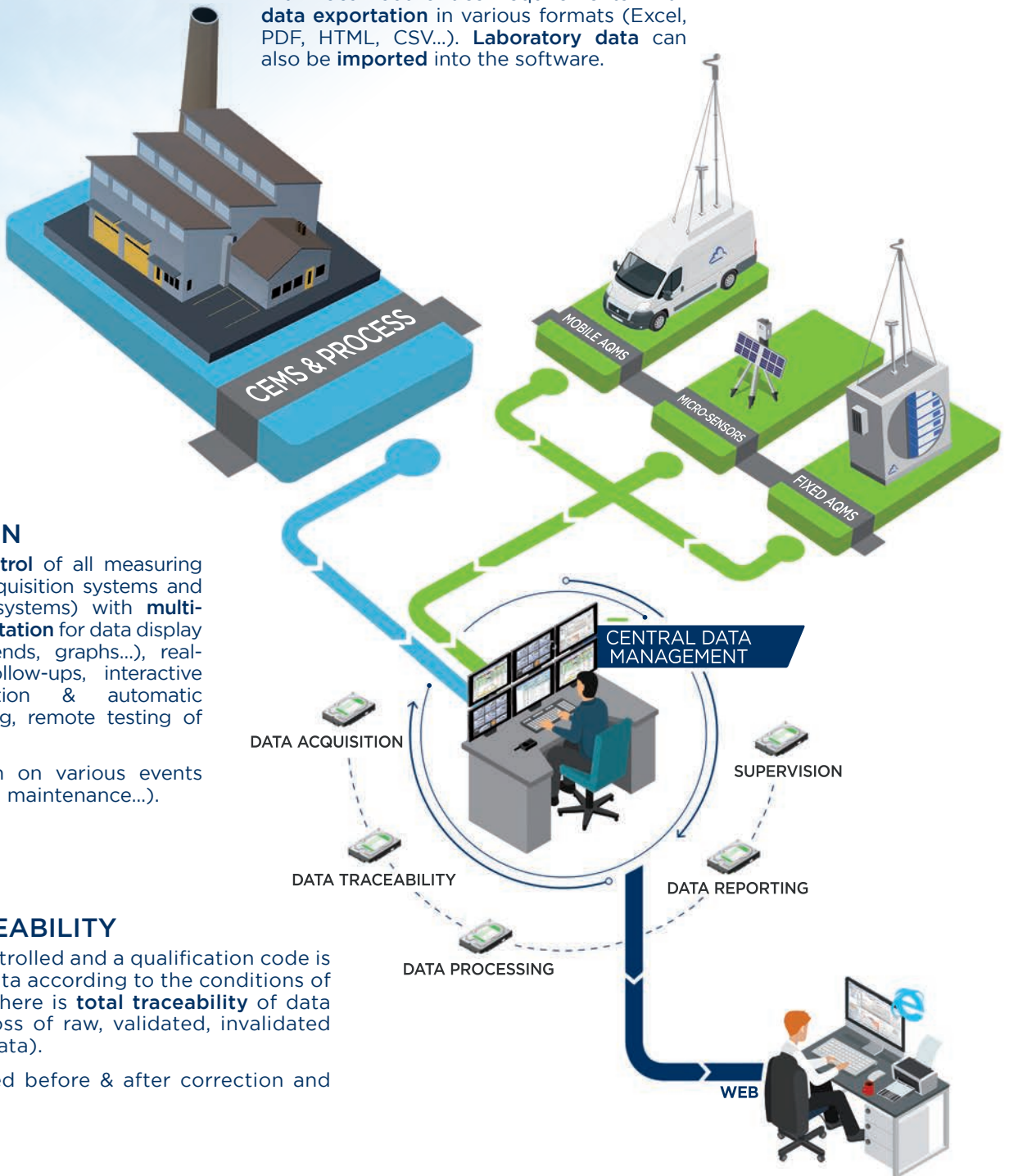
EXCESS EMISSION CONTROLS

Real-time monitoring of parameters, overruns & calculated means. **Emission Limit Value (ELV)** exceedance detection included, as well as **trend monitoring** for early warning alerts. Management of various ELVs.



REPORT MANAGEMENT

Automatic reports output in compliance with local authorities requirements with **data exportation** in various formats (Excel, PDF, HTML, CSV...). **Laboratory data** can also be **imported** into the software.



SUPERVISION

Follow-up & control of all measuring devices (data acquisition systems and communication systems) with **multi-window representation** for data display (raw, means, trends, graphs...), real-time graphic follow-ups, interactive set-up, calibration & automatic results monitoring, remote testing of interfaces, etc...

Alerts are given on various events (defaults, alarms, maintenance...).

DATA TRACEABILITY

Each data is controlled and a qualification code is given to each data according to the conditions of measurement. There is **total traceability** of data & actions (no loss of raw, validated, invalidated and corrected data).

All data is stored before & after correction and validation.

DATA CONTROL & QUALITY ASSURANCE

The software provides the **audit of compliance** of all CEMS installations and the management of the **QAL 2 calibration function**. It automatically/manually generates **QA reports**. It also automatically brands invalid data (outside validity range).

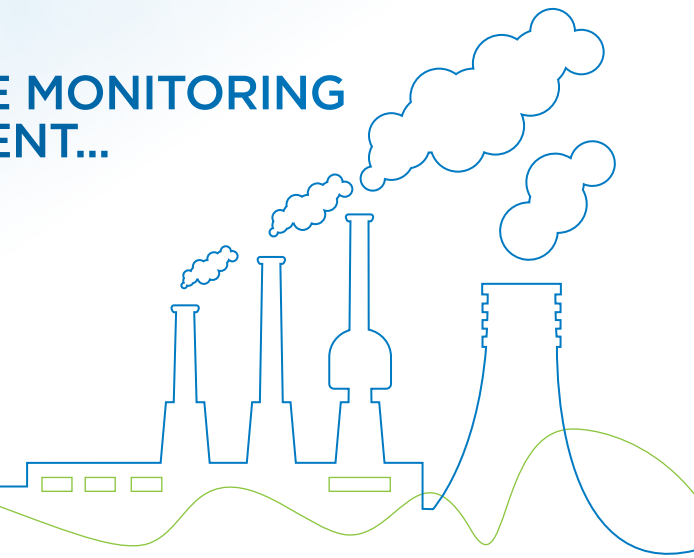
In compliance with the **EN 14181 requirements**, WEX™ includes control charts and other SPC (statistical process control) techniques. An automatic/manual **QAL 3** is available.

The software assigns a **quality code** to raw and average data (maintenance, calibration, drift, alerts, failure...) along with **automatic analysis & result monitoring**.



Our expertise allows us to deploy our solutions while your process is running, and without interfering with production.

A LEADING PROVIDER OF ONLINE MONITORING SOLUTIONS FOR THE ENVIRONMENT...



EMISSIONS MONITORING

Continuous emissions monitoring systems (gas, flow and particulates, dioxins & mercury samplers) for regulatory compliance: power and cement plants, chemical and fertilizers industry, waste incinerators...



REGULATORY REPORTING

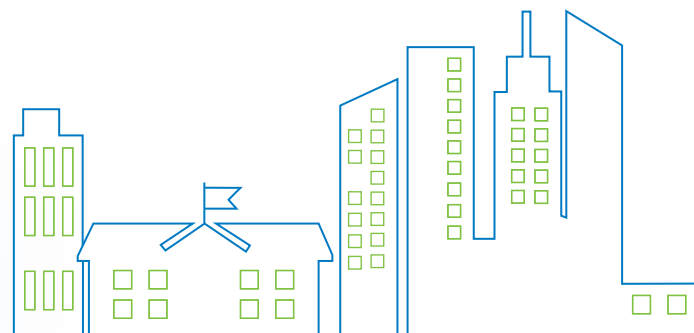
Data acquisition, data management

- Data acquisition and management of emissions, air quality, meteorological, water and process parameters
- Software for data processing, event warnings, reports, broadcasting...

ENVIRONMENTAL IMPACT SURVEILLANCE

Ambient air quality monitoring networks of multi-parameter stations and mobile laboratories using a variety of instruments

- Certified gas & particulate monitors
- Approved particulate monitors
- Real-time, sensor-based air quality micro-stations
 - Environmental impact surveys
 - Fugitive emission detection
 - Fence-line surveillance
 - Leak detection
 - Odor monitoring



...AND FOR YOUR INDUSTRIAL PROCESSES


Continuous monitoring instruments for bag-house filter performance control, bag leak detectors, flue gas & solid flow moisture monitoring, level detection, reagent injection control, etc. allowing the optimization of your processes: raw material & energy savings, reduction of environmental impacts...

Powder flow measurement up to 100 kg/h




PicoFlow

Solids flow measurement up to 20 t/h




SolidFlow 2.0

Solids mass flow measurement up to 300 t/h




MaxxFLOW HTC

Volume flow measurement in dusty applications



Airflow-P

Material flow detection (flow/no flow)



FlowJam Plus

Online solids residual moisture measurement



M-Sens 3

Flow monitoring for powders in air slides




SlideControl 2.0

Solids level monitoring



ProGap 2.0

Velocity measurement for solids



SpeedFlow 2.0

Bulk material continuous level measurements



Nico 120

Dust filter damage monitoring



Dusty

Dust filter leakage monitoring



Leak Alert

CUSTOMER SUPPORT & SERVICES

With the global focus on emissions, the Group helps its clients quickly achieve **environmental compliance** in the most **cost-effective** manner. We perform conceptual studies to full engineering, procurement, construction and commissioning of **turnkey systems** for continuous emissions monitoring services.

Since inaccurate measurements, poor performance and non-compliance can be very costly in regards to environmental responsibilities, our clients trust us to deliver the necessary solutions that improve their **plant performances** and ensure compliance with **clean air regulations** worldwide.



In this highly technical domain, the group offers its customers and partners industry leading expertise through a comprehensive range of technical services, training packages and a **“knowledge transfer”** approach. The aim is to advise and support, both customers and partners, in meeting the specific monitoring challenges they face (from initial consultation & product selection through life-cycle support & tailored maintenance programs).

Our **Technical Support Team** brings experience from a wide range of applications and industrial sectors, ensuring that systems are set-up, operated and maintained to maximize functionality for their intended purpose.

CUSTOMER SERVICE

A range of **service & maintenance contracts** cover customer support, preventive maintenance, equipment calibration, system optimization and training.

These contracts provide a structured schedule of services over an extended period of time, allowing you to have the certainty that our technicians intervene timely in order to minimize downtime and process intervention.

Our **maintenance contracts** entitle you to **discounts** on the purchase of replacement parts and consumables.

TECHNICAL SUPPORT

Our **Training programs** are customized and will specifically adhere to your **company's particular needs**, whether you require instruction for an individual or a group.

Training options are designed to be conducted in a classroom, on site or in factory settings. Do not hesitate to contact us in order to discuss your personalized solution.

Our setup packages are designed to ensure that your operators obtain **maximum benefits** and functionality from your systems starting day one.

Our experience includes thousands of environmental compliance projects around the world.

PRODUCT OVERVIEW

Gases	HCl	HF	NO	NO ₂	N ₂ O	NO _x	SO ₂	CO	CH ₄	TOC	NH ₃	H ₂ O (%)	CO ₂ (%)	O ₂ (%)
MIR 9000e				0-100 / 5000	0-50 / 1000	0-100 / 5000	0-75 / 7500	0-75 / 12500	0-50 / 1000			0-2	0-20 / 30	0-25
MIR 9000P			0-70 / 3300	0-110 / 5000	0-1000	0-70 / 3300 0-110 / 5000	0-141 / 8500	0-60 / 8000	0-70 / 700			0-2	0-20 / 30	0-10 / 25
MIR 9000	0-15 / 5000	0-20 / 300	0-100 / 5000	0-100 / 1000	0-20 / 1000	0-200 / 5000	0-75 / 5000	0-75 / 10000	0-10 / 1000	0-50 / 5000			0-10 / 100	0-10 / 25
MIR 9000CLD	0-15 / 5000	0-25 / 300	0-20 / 2000	0-20 / 2000	0-20 / 2000	0-20 / 2000	0-75 / 5000	0-75 / 10000	0-10 / 1000	0-50 / 5000			0-10 / 100	0-10 / 25
MIR 9000CLD RACK			0-20 / 2000	0-20 / 1000		0-20 / 2000							0-20	0-10 / 25
MIR 9000H	0-100 / 5000	0-40 / 300	0-200 / 5000	0-200 / 5000		0-200 / 5000	0-500 / 5000	0-75 / 10000			0-15 / 500	0-30 / 40	0-10 / 100	0-10 / 25
LAS 300 RK (ppm)	0-10 / 500	0-5									0-15			0-30
MIR FT	0-15 / 500	0-3 / 100	0-200 / 2000	0-200 / 2000	0-100 / 500	0-200 / 2000	0-75 / 20000	0-75 / 10000	0-15 / 1000	0-50 / 1000	0-15 / 500	0-30 / 40	0-10 / 30	0-10 / 25
TOPAZE 32M			0-10 / 10000	0-10 / 10000		0-10 / 10000								
GRAPHITE 52M									0-10 / 10000	0-10 / 10000				
LAS 300 XD (ppm)	0-10 / 3000 (H ₂ O: 0-50%)	0-100						Low: 0-500 High: 0-100%			0-15 / 500 (H ₂ O 0-50%)			0-10 / 100
MIR IS	0-15 / 5000	0-20 / 300	0-100 / 5000	0-100 / 1000	0-20 / 1000	0-200 / 5000	0-75 / 5000	0-75 / 10000	0-10 / 1000	0-50 / 5000			0-10 / 100	0-10 / 25
AC32e (*)			0-150 / 3000	0-200 / 4000		0-200 / 4000								
CO12e (*)								0-300 / 6000					0-20	
AF22e (*)							0-300 / 6000							H ₂ S / TRS 0-150
HC51M (*)									0-150 / 3500	0-400 / 4000				nmHC 0-400 / 4000

Lowest / Highest available ranges expressed in mg/m³ (may vary with your site conditions to be indicated on the Site Survey Form)

(*) Min/Max based on 100/200 Dilution Rate (other ranges & dilution rates available upon request)

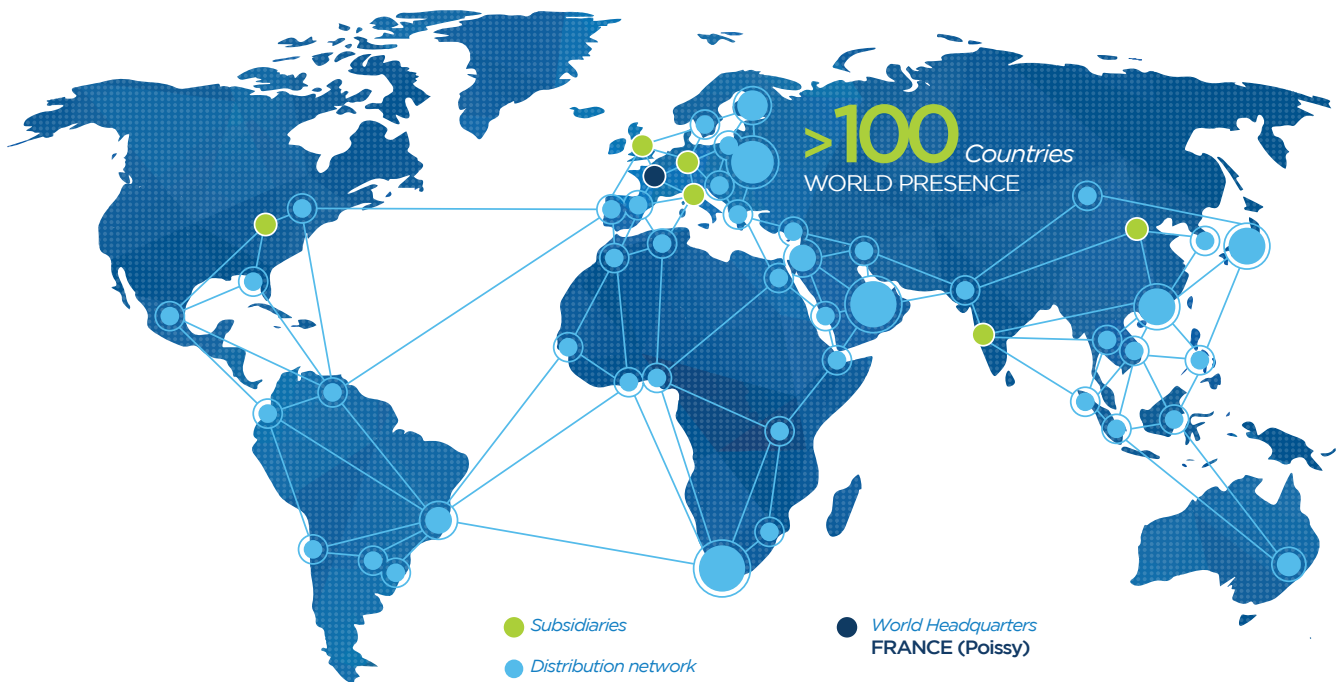
■ Cold/Dry Extraction
 ■ Hot/Wet Extraction
 ■ In-Situ
 ■ Dilution Extraction

Particulates	T<250°C	T<500°C	Velocity (m/s)	Water Droplets	Hazard Zone	Bag Filter	Cartridge Filter	ESP	WESP	FGD	SCR
QAL 181	●	● (Optional)	Not Applicable	-	●	●	●	●	-	-	●
QAL 182 WS	●	-	Up to 30	40% Volume	-	●	●	●	●	●	●
STACK 710	●	●	Not Applicable	-	-	●	-	●	-	-	●
QAL 991	●	●	> 8	-	●	●	●	-	-	-	●
QAL 260	●	●	Not Applicable	-	-	●	●	●	-	-	●
QAL 360	●	●	Not Applicable	-	-	●	●	●	-	-	●

Flow	T<250°C	T<500°C	Velocity (m/s)	Water Droplets	Hazard Zone	Bag Filter	Cartridge Filter	ESP	WESP	FGD	SCR
STACKFLOW 400	● (≤ 200°C)	-	0 - 30 (0 - 50)	●	-	●	●	●	-	-	●
STACKFLOW 200	●	●	2 - 30 (2 - 50)	●	-	●	●	●	-	-	●
STACKFLOW 100	●	●	5 - 30	●	-	●	●	●	-	-	●

A STRONG GLOBAL PRESENCE

Faithful to the principles on which it was founded – innovation & quality, social responsibility & shared values – the **ENVEA** group is committed to providing you with solutions and assistance at the highest standards in order to comply with applicable regulations; as well as the optimization of industrial processes for an improved efficiency, significant savings of raw materials & energy, the reduction of environmental impacts...



Our worldwide references guarantee a perfect understanding of your needs and ability to manage a vast range of applications:

More than 40 000 air quality monitors are measuring the pollution of cities worldwide: Rio de Janeiro, Istanbul, Seoul, Mecca, Delhi, Hanoi, Paris, Budapest, Abu Dhabi, Bangkok, Dakar, Beijing...

Over 30 000 industrials sites (emission sources & processes) are monitored worldwide across a broad range of industries such as: cement plants, glass manufacturing, metal factories, paper mills, engine manufacturers, waste to energy plants...

Process - Emissions - Ambient
monitoring solutions



ENVEA (Headquarters)
111 Bd Robespierre - CS 80004
78300 Poissy / Cedex 4 - FRANCE
☎ +33(0) 1 39 22 38 00
✉ info@envea.global



Visit us on:
www.envea.global

