

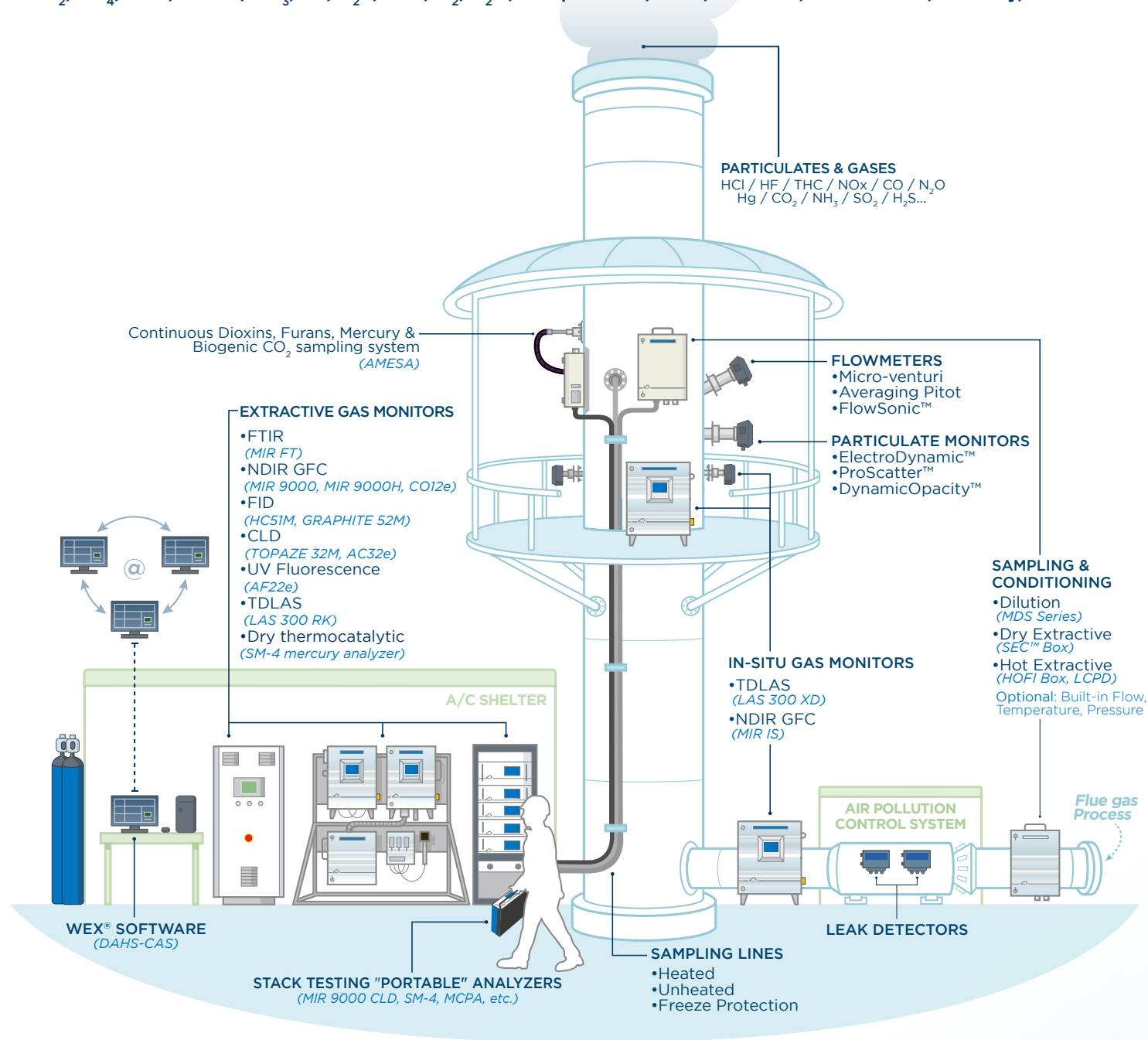
CEMS

CONTINUOUS EMISSIONS MONITORING SYSTEMS

Our full range solutions	2
Sampling	6
Extractive systems	9
Gas analyzers	
Dilution based monitoring	
Mercury analyzers	
In-situ monitors	14
Gas analyzers	
Stack flowmeters	
Particulate analyzers	
Long term sampling	17
Regulatory reporting solutions	18
Customer support & services	22
Recap board	23

COMPLETE 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 regulatory pollutants such as: HCl, SO₂, NO, NO₂, NO_x, N₂O, CO, CO₂, CH₄, THC, nmHC, NH₃, HF, H₂S, TRS, O₂, H₂O, Temperature, Flow, Pressure, Particulates, Mercury, Dioxins...



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, no matter the industrial domain:

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

A photograph of an industrial facility, likely a refinery or chemical plant. The scene is dominated by a tall, slender, silver-colored metal stack or chimney that rises vertically into a clear blue sky. This stack is encased within a complex, lattice-like metal framework of scaffolding and support beams. At the top of the stack, there are several small, white, circular antennas or sensors. To the left of the main stack, there is a large, multi-level structure covered in extensive scaffolding, suggesting ongoing construction or maintenance. In the foreground, there are various industrial components: large, horizontal pipes, metal railings, and several large, cylindrical storage tanks. The overall color palette is industrial, with greys, silvers, and blues, contrasted against the bright blue sky.

BECAUSE YOUR INDUSTRIAL SITE IS UNIQUE,
IT IS OUR SOLUTIONS THAT ADAPT TO YOUR NEEDS
AND NOT THE OTHER WAY AROUND.

CUSTOM-TAILORED DESIGN & ENGINEERING OF YOUR PROJECTS

With the many years of industrial experience, our systems are designed with an approach that provides a comprehensive & client-oriented solution to all your demands.

Each system is fully configured to meet the ever-evolving technical & regulatory requirements and needs, of our activity domain and/or the challenges of your company.



The partnership with the Environnement S.A Group ensures high value relations through proven solutions that comply with regulatory requirements, improve environmental performances, and control & assist in reducing costs:

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

Prior to shipment, a Factory Acceptance Test (FAT) of the complete system ensures the highest quality and performance.

After the commissioning and installation, you can rely on our service team for all necessary support you may require: on-site training, performance testing, troubleshooting, spare parts next day delivery, etc.

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.

*Our commitment to your satisfaction
goes on beyond start-up and certification*

PRODUCT CERTIFICATIONS & APPROVALS

We offer a range of state of the art CEMS products, tested and certified in order to ensure the highest level of performance and regulatory compliance of your processes. Our solutions are in compliance with the latest regulations & standards:

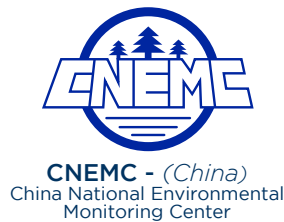
- Industrial Emission Directive (IED) n°2010/75/EU
- Waste Incineration Directive (WID) n°2000/76/EC
- Large Combustion Plant Directive (LCPD) n°2001/80/EC
- **EN 14181** (Stationary source emissions – Quality assurance of automated measuring systems)
- **EN 15267** (Air quality – Certification of automated measuring systems)
- **QAL 1, QAL 2 & QAL 3** (Quality Assurance Levels of the **EN 14181** standard)...

QAL 1
EN 15267

QAL 2
EN 14181

QAL 3
EN 14181

They are also worldwide approved and certified by various laboratories and organizations such as:



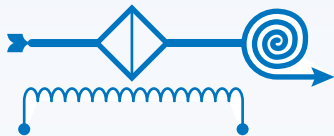
GAS SAMPLING SYSTEMS

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:

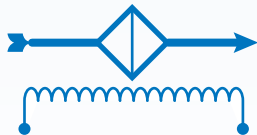
CD Cold Dry Extractive – Dry Basis Analysis

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 conserve its moisture content and 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 – Analysis at single point in-stack

A probe containing a 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

LT LONG TERM SAMPLING

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

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

Long term Sorbent Trap Monitoring 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 continuous monitors
- Ensures reliable results and at very low concentrations
- Direct in-stack or near stack sample capture
- No calibration or carrier gas required

Environnement S.A Group offers an exclusive dry extractive SEC™ system which dries the gas sample at the stack, eliminating thus the necessity of an expensive heated sampling line.

Stack Gas Sampling System

The SEC™ BOX offers a sampling system that uses an exclusive dry permeation 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™ flowmeter on the same flange

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

HOFI™ BOX

LCPD

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 backflush 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, Topaze 32M

Heated Sampling System

The LCPD is a full extractive sampling probe assembly which extracts the sample gas through a probe tube & 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 blowback
- Heated filter prevents condensation



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

DIL-1 / MS-1

The Dilution System

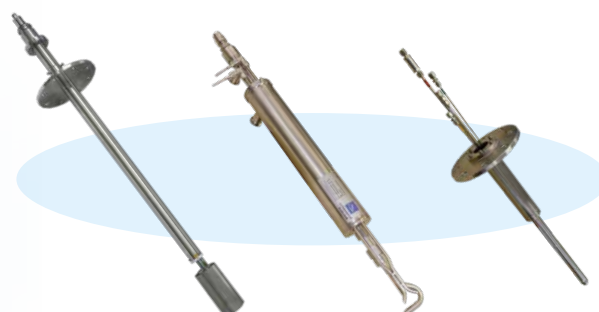
Ideal for mid-high to high concentrations, also for sampling locations in hazardous areas (ATEX).

- 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 backflush 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 MULTI-GAS ANALYZERS

MIR 9000

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

Offers excellent performance for multi-gas measurements, 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 corrosive samples
- Fast & simultaneous measurements of up to 10 gases
- Dry basis measurement
- Automatic cross interference correction
- Compatible with drying technologies (e.g. SEC® box)
- Intrinsic security with residual H₂O measurement
- On-board paramagnetic cell for long term O₂ measurement



	HCl	HF	NO	NO ₂	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	0-20 / 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)

Using the heated Infrared GFC technology, the MIR 9000H is a perfect multi-gas analyzer for the measurement of: HCl, HF, NH₃, NO, NO₂, N₂O, SO₂, CO, H₂O, CO₂ and O₂

- 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 and dry compressed air



	HCl	HF	NO	NO ₂	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	0-500 / 5000	0-50 / 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 NO_x 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
- Utilizes the permeation drying technology: heated sampling line not required (cost reduction)
- 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 NO_x monitoring



- Incorporates optionally up to 3 monitoring technologies: CLD for low level NO_x measurements, on-board paramagnetic cell for O₂ measurement & additional module for quenching corrections for CO₂ measures
- Compatible with various drying technologies such as a SEC sampling system or gas cooler
- Built-in data logger for 7 additional parameters (flow, pressure, temperature or any other analogue input)

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

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

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 a leading edge 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.
- TOC can also be measured with an additional FID analyzer
- All in one system including industrial PC & software for on-board data acquisition & processing



	HCl	HF	NO	NO ₂	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	0-100 / 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

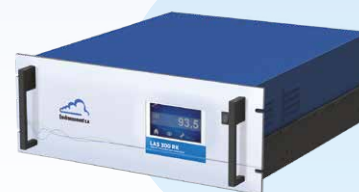
Lowest / Highest available ranges (others available upon request), expressed in mg/m³ (or % when indicated)

LAS 300 RK

Extractive Tunable Diode Laser Absorption Spectroscopy Analyzer

Capable of stable & reproducible high precision measuring of a selective compound among: 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 stable results
- Measurements performed at reduced pressure allowing for 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	0-5 / 800	0-5	0-10	0-30

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

TOPAZE 32M

Heated Chemiluminescence (CLD) Nitrogen Oxides Analyzer

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



- Heated analyzer (temperature controlled up to 180°C), measuring chamber under vacuum resulting minimized 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

	NO _x	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 the elements in contact with the sample from its extraction to the analysis are heated at 191°C
- 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

As low-concentration “ambient air” analyzers, with the innovative design & eco-friendly, the e-Series are known for:

- Sustainable eco-design (with no use of heavy metals. e.g. Mercury)
- 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 lifespan, excellent accuracy
- Color touchscreen display
- Reliable electronics

The no-screen version of the analyzer avoids the pollution related to the screen manufacturing and recycling cycle:
The display is already in your pocket.



example of e-Series monitor (AC32e)



ESA Connect™



AF22e

e-Series UV Fluorescence Sulfur Dioxide Analyzer

Uses UV radiation to measure SO₂, with excellent performance, for a range from 0.4 ppb to 10 ppm

- Option: module for H₂S/TRS monitoring (max 1 ppm), configuration for TRS measurements in CO₂ matrix

	SO ₂	H ₂ S	TRS
AF22e	0-300 / 6000	0 - 150	0 - 150

CO12e

e-Series IR-GFC Carbon Monoxide Analyzer

IR-GFC analyzer designed for high sensitivity monitoring of low CO concentrations in the range of 40 ppb to 300 ppm

- Option: CO₂ measuring module (max 2000 ppm)

	CO	CO ₂
CO12e	0-300 / 6000	0 - 20%

AC32e

e-Series Chemiluminescence Nitrogen Oxides Analyzer

CLD based analyzer offering superior metrological performances for NO, NO₂ and NO_x measurements in the range 0-1 ppm or 0-10 ppm

	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

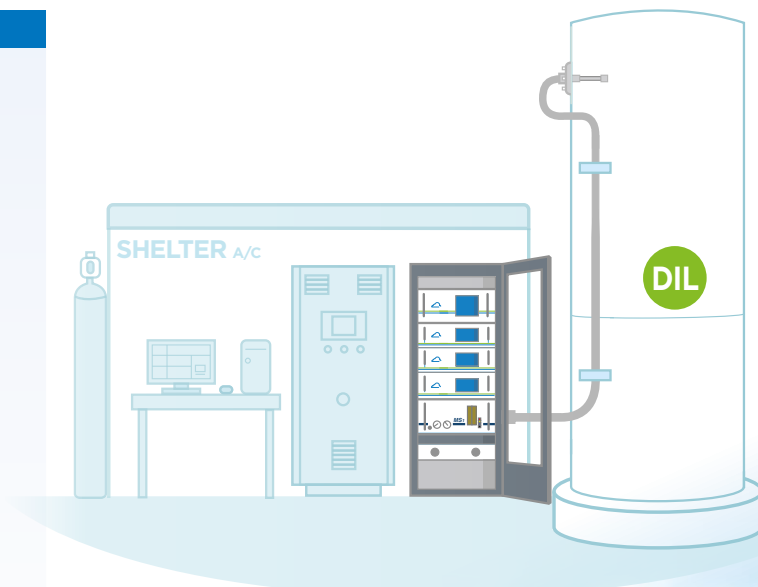
Uses the principle of flame ionization detection to measure the concentration of hydrocarbons



- 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

	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



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

NEW PRODUCT RANGE: MERCURY ANALYSIS

Mercury Instruments GmbH, a leading innovator for mercury analysis, has recently joined the Environnement S.A Group under the new brand **envea™**. This latest addition of the German company strengthens the group's expertise in the field, which will become crucial in the coming years. On the one hand, strict measurement requirements for mercury emitting industries (the Minamata convention – applicable starting 2020 – that will primarily concern China, the USA & India). And on the other hand, two European directives for thermal power plants and incinerators that will impact the European market starting 2019.

With more than 20 years of experience as a bespoke solutions provider in various applications, Mercury Instruments has distinguished itself by developing the first mercury emissions monitoring system using the dry thermocatalytic method. It is now possible to avoid the use of chemical reagents and thus optimize operating costs and measurement availability.



With its ambitious research program, the company today has the widest range of mercury measurement systems worldwide, for the most diverse applications:

- Process control
- Ambient air
- Health security
- Continuous monitoring of flue gas emissions (CEMS)
- Gas Industry
- Food & medical analysis
- Research...

Whether it is to detect mercury traces in flue gas, natural gas, liquids, ambient air or even laboratory samples, we offer the most appropriate solution for your application, in compliance with national European and American safety standards and regulations.



CONTINUOUS MERCURY EMISSIONS MONITORING

Mercury Instruments has developed the SM-4 analyzer specifically for total mercury emission monitoring applications in order to measure very low levels of mercury in flue gases as well as complex matrices (SO₂, NO_x, HCl, etc.) with high accuracy and reliability.

SM-4



- Dry thermocatalytic method: **no need for reagents**, water refills or solid reagent cartridge replacements
- Continuous measurement of total Hg (elementary, ionic & organic)
- Sample dilution directly at the sampling point, allowing large measuring range and the elimination of interferences from matrix gases
- Sampling system – composed of the probe, the dilution unit and the low temperature catalytic converter – is entirely heated to avoid mercury adsorption
- Sampling unit directly on stack: maintenance-free and no transport of ionic Hg
- Sampling line length up to 100 m (300 ft)
- No liquid waste or condensate generated
- Extremely high precision measurement
- Automatic back-flush function
- Fast response: t(90) time, typically 180-360 sec
- Option to install elemental Hg calibration gas generator, NIST traceable, inside analyzer cabinet
- Very low maintenance (service interval: ≥ 3 months) – can be automated

Main applications :

- Coal fired power plants (before & after mercury absorbers)
- Cement kilns
- Sulfuric acid producing foundries
- Incineration plants (industrial, domestic, medical waste, sewage sludge...)
- Thermal treatment of contaminated soils, hazardous waste, etc.
- Metallurgical facilities with potential Hg emissions...

Also available in a transportable version!

SM-4 MOBILE

Easy to transport, assemble & dismount. Ideal for the determination of total vapor phase Hg emissions at varying measuring points & sites (especially for the control of Hg reduction systems efficiency)



Fits into every van
or
stationwagon



Options :

- Automatic calibration for elementary & ionic Hg
- Automatic & programmable QAL 3, according to the standard EN 14181
- Total mercury measurement

QAL 1 certified by TÜV according to EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007 et EN 14181: 2004

	Hg
SM-4	0,05-500 (option 0,05-1000)
Lowest / Highest available ranges (others available upon request), expressed in µg/m ³	

IN-SITU MONITORS

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
- FTP parameters (optional)



	HCl	HF	NO	NO ₂	N ₂ O	SO ₂	CO	CH ₄	TOC	CO ₂ (%)	O ₂ (%)
MIR IS	0-15 / 5000	0-20 / 3000	0-100 / 5000	0-100 / 1000	0-20 / 1000	0-75 / 5000	0-75 / 5000	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	0-20 / 500 + 0-30%	0-10 / 3000 + 0-30%	0-100	0-10% / 100%	Low: 0-500 High: 0-100%

Lowest / Highest available ranges expressed in mg/m³ (or % when indicated)

Ranges indicated vary with installation conditions (indicated ranges for 1 m path-line at standard temperature and pressure conditions)



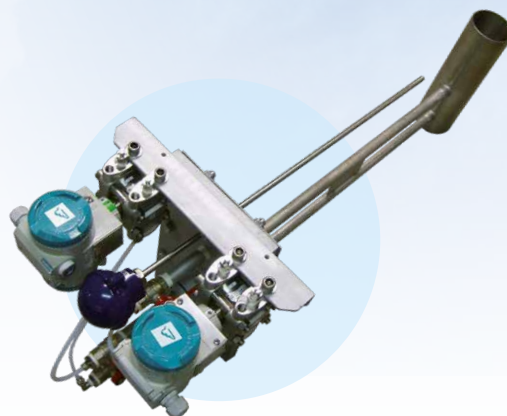
STACK FLOWMETERS

STACKFLOW 100™

Micro-Venturi technology

The STACKFLOW 100™ is a compact Micro-Venturi flowmeter for Flow, Temperature and Pressure (FTP) 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



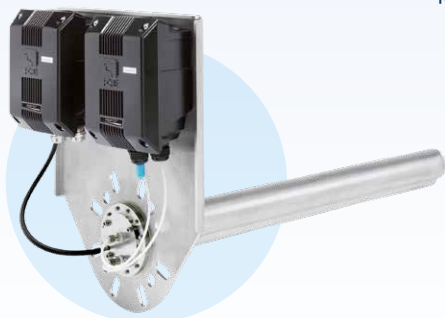
	Velocity
STACKFLOW 100™	5 - 30 m/s

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 FTP measurement to assess regulatory requirements



Sensor available in different lengths
(0.6 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 back-flush "water hammer" type system for difficult processes

	Velocity
STACKFLOW 200™	3 - 30 m/s (± 3%)

STACKFLOW 400™

Ultrasonic Flow technology

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

- Unique extended measurement path (400mm) permits accurate & increased representative measurements
- Facilitates stack velocity, volumetric flow 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 reference self-checks for regulatory compliance (QAL 3)



	Velocity
STACKFLOW 400™	0 - 30 m/s (± 2.5%)

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

PARTICULATE 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 & system self-checks

	PM
QAL 181	0-15 / 100 mg/m ³

QAL 181 WS / QAL 182 WS

Forward ProScatter™ technology

Gas particulate analyzer for emissions from wet scrubbers and other processes where flue gas is below dew point.



- 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	0-15 / 100 mg/m ³

STACK 710

Green LED Measurement Technique

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



- Opacity calculated by measuring loss of visible light over path-length.
- "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 (%)
STACK 710	0-10 / 0-100

QAL 991

ElectroDynamic™ Probe Electrification technology

The QAL 991 Bag Leak Detector features automatic self checks and provides plant operators with pre-emptive warnings



- 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 - 15 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 - 15 mg/m ³
QAL 360	0 - 7.5 mg/m ³

MERCURY, DIOXINS, FURANS & BIOGENIC CO₂ SAMPLERS



AMESA
Sampling unit

AMESA-D®

Dioxins & Furans Long Term Sampler

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 6 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 solution with stored data on USB port
- Cooled probe composed of different materials and lengths to fit the application



AMESA
Control unit

I-TEQ (TÜV)

AMESA-D

0 - 0.2 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.

- A 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 certificates unnecessary
- helps governments demonstrate green energy policy



Available in 2
formats

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 2 weeks
- Easy transfer of the operating data protocol by the use of a USB memory stick
- 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)

CO₂

AMESA-B

0 - 30 %

Hg

AMESA-M

0 - 10 µg/m³

REGULATORY REPORTING SOLUTIONS

WEX™

MCERTS CERTIFIED EMISSIONS MANAGEMENT SYSTEM

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
- 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 made to be highly reliable and to sustain your activity in the same way.

DATA ACQUISITION

WEX™ acquires data in real-time, from **multiple sources**, over 250 protocols of communication including MODBUS, OPC... being included. 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...).

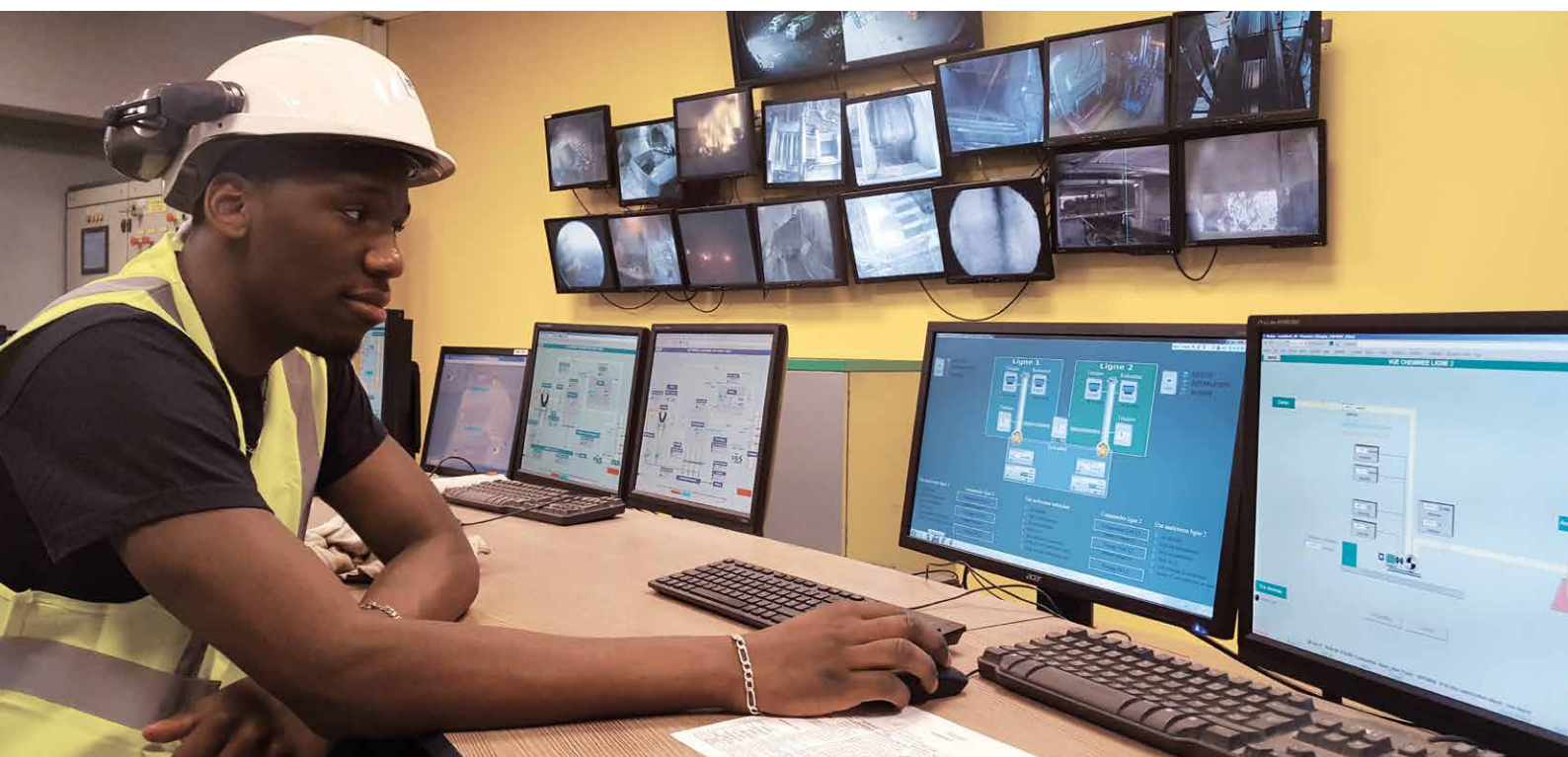
BACK-UP SYSTEM

An **automatic & permanent back-up** of the software system is available on a separate CPU. 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).

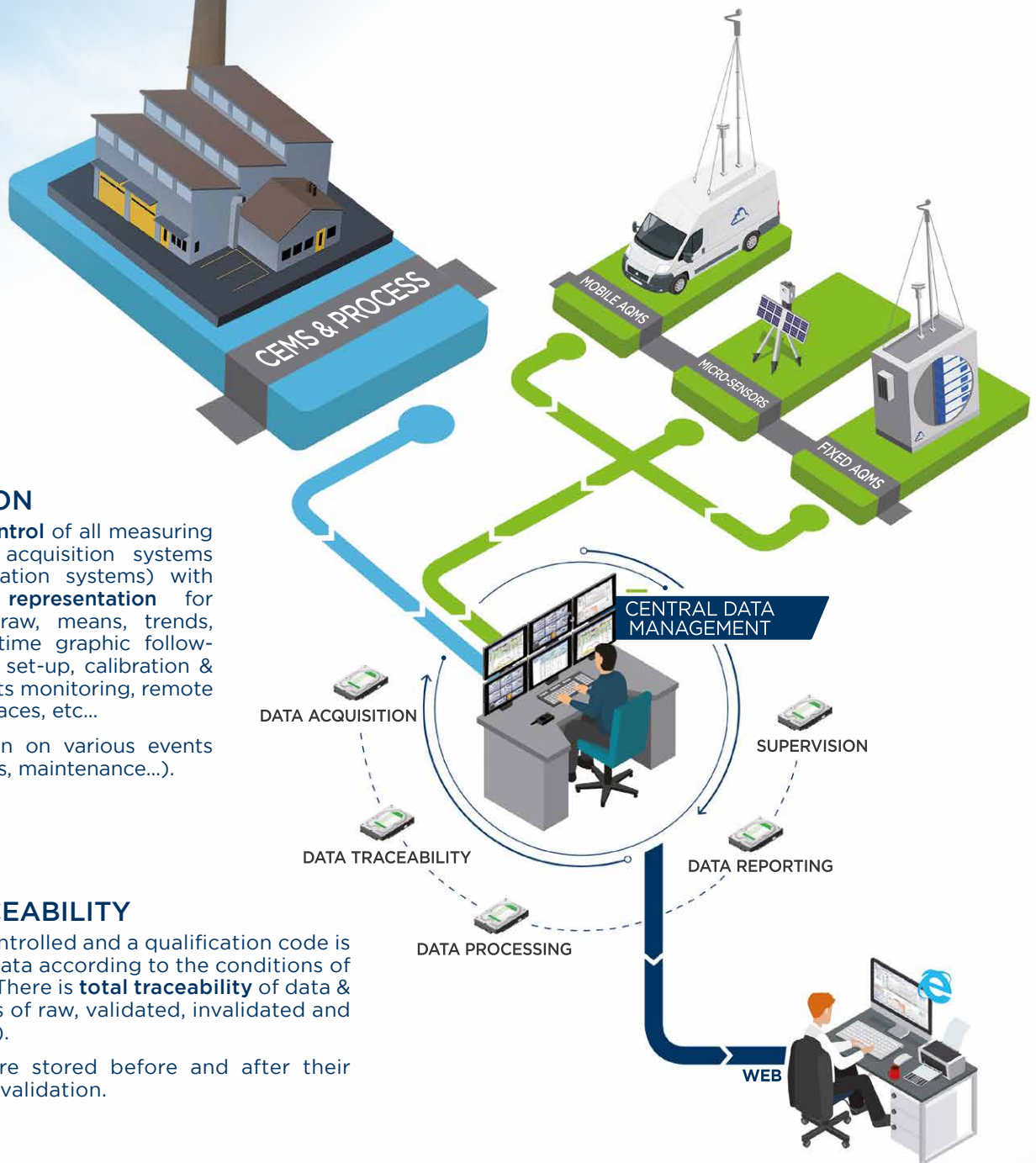
All the data are stored before and after their correction and validation.

DATA CONTROL & QUALITY ASSURANCE

The software provides the **audit of compliance** of all CEM 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**.



Server & PC installation, configuration, commissioning & on site reception; with a possibility of multi-user & multi-station architecture. Contractual updates and insured evolution to guarantee the continuity of your regulatory conformity.

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

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

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



...AND FOR YOUR INDUSTRIAL PROCESSES

Continuous monitoring instruments for bag-house filter performance control, leak alerts, 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

Material flow monitoring for hose lines



FlowJam A

Material flow detection (flow/no flow)



FlowJam Plus

Online solids residual moisture measurement



M-Sens 2

Flow monitoring for powders in air slides



SlideControl

Solids level monitoring



ProGap

Velocity measurement for solids



SpeedFlow

Bulk material continuous level measurements



Nico 15/30

Dust filter damage monitoring



Dusty

Filter leakage monitoring



Leak Alert

You can find a complete line of our process instruments at www.swr-engineering.com

CUSTOMER SUPPORT & SERVICES

With the global focus on emissions, the Environnement S.A 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.



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

The group offers industry leading expertise to customers and partners 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).

The **Technical Support Services 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.

SERVICE SUPPORT

A range of **service contracts** covers preventive maintenance, calibration services, extended warranty & rapid breakdown response.

These service contracts provide scheduled structure of support over an extended period of time. The reactive call-out options provide the operators with confidence that our Service Engineers are hands-on for routine services, inspections & repair works, and in a manner that minimizes downtime & process intervention.

TAILORED SERVICES

The Environnement S.A Group offers fully tailored service packages to meet customer requirements. Please consult us to discuss your tailored service solution.

A **maintenance contract** entitles the customer to **discounts** on the purchase of replacement parts and consumables.

SETUP PACKAGES

Our packages range from basic setup assistance to complete turnkey installation and commissioning services. These setup packages include sampling, calibration & on-site system appreciation training.

Packages are designed to ensure that operators obtain **maximum** functionality and benefits from their system from day one.

TECHNICAL SUPPORT

Training programs are custom-tailored and will specifically adhere to your **company's particular needs**, whether you require instruction for one individual or a group of 20 or more.

Available training options are designed to be conducted in classroom, on-site, or in factory settings.

We can help you run the plant as efficiently and smoothly as possible without compromising safety

RECAP BOARD

Gases		HCl	HF	NO	NO ₂	N ₂ O	SO ₂	CO	CH ₄	TOC	NH ₃	H ₂ O (%)	CO ₂ (%)	O ₂ (%)	NOx
CD	MIR 9000	0-15 / 5000	0-20 / 300	0-100 / 5000	0-100 / 1000	0-20 / 1000	0-75 / 5000	0-75 / 5000	0-10 / 1000	0-50 / 5000			0-10 / 100	0-10 / 25	
	MIR 9000 CLD	0-15 / 5000	0-20 / 300	0-20 / 2000	0-20 / 2000	0-20 / 1000	0-75 / 5000	0-75 / 5000	0-10 / 1000	0-50 / 5000			0-10 / 100	0-10 / 25	0-20 / 2000
	MIR 9000 CLD RACK			0-20 / 2000	0-20 / 1000								0-20	0-10 / 25	0-20 / 2000
HW	MIR 9000H	0-100 / 5000	0-40 / 300	0-200 / 5000	0-200 / 5000		0-500 / 5000	0-50 / 10000			0-15 / 500	0-30 / 40	0-10 / 100	0-10 / 25	
	LAS 300 RK	0-15 / 800	0-5								0-10			0-30	
	MIR FT	0-15 / 500	0-3 / 100	0-200 / 2000	0-200 / 2000	0-100 / 500	0-75 / 20 000	0-75 / 10 000	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					
IS	LAS 300 XD	0-10 / 3000 (H ₂ O 0-30%)	0-100					Low: 0-500 High: 0-100%			0-20 / 500 (H ₂ O 0-30%)			0-10 / 100	
	MIR IS	0-15 / 5000	0-20 / 300	0-100 / 5000	0-100 / 1000	0-20 / 1000	0-75 / 5000	0-75 / 5000	0-10 / 1000	0-50 / 5000			0-10 / 100	0-10 / 25	
DIL	AC32e (*)			0-150 / 3000	0-200 / 4000										0-200 / 4000
	CO12e (*)							0-300 / 7500					0-20		
	AF22e (*)						0-300 / 6000						H ₂ S / TRS 0-150 mg/m ³		
	HC51M (*)								0-150 / 3500	0-400 / 4000			nmHC 0-400 / 4000 mg/m ³		

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

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

Particulates		T<250°C	T<500°C	Velocity (m/s)	Water Droplets	ATEX (Optional)	Bag Filter	Cartridge Filter	ESP	WESP	FGD	SCR
IS	QAL 181	●	● (Optional)	Not restricted	-	●	●	●	●	-	-	●
	QAL 182 WS	Temperature Limit 180°C	-	Up to 30	40% Volume	-	●	●	●	●	●	●
	STACK 710	●	● (Flange Temperature 200°C)	Not restricted	-	-	●	-	●	-	-	●
	QAL 991	●	●	> 8	-	●	●	●	-	-	-	●
	QAL 260	●	400°C (Optional)	Not restricted	-	-	●	●	●	-	-	●
	QAL 360	●	400°C (Optional)	Not restricted	-	-	●	●	●	-	-	●
Flow												
IS	STACKFLOW 400™	● (≤ 200°C)	-	0 - 30 (± 2.5%)	●	-	●	●	●	-	-	●
	STACKFLOW 200™	●	●	3 - 30 (± 3%)	●	-	●	●	●	-	-	●
	STACKFLOW 100™	●	●	5 - 30	●	-	●	●	●	-	-	●

TOGETHER WE ARE **envea**TM

A new trademark to unify the technologies of the Environnement S.A Group

PCME Ltd Environnement S.A SWR engineering
Cairpol Sensors iséo Environnement TDL sensors Ltd
OTI industrie Mercury Instruments

In line with its development strategy and desire to unite its technologies, production sites & sales subsidiaries, the Environnement S.A Group has created the global commercial brand **envea**TM. It hopes to provide its clients with a clearer vision on its solutions of the measurement, acquisition & processing of environmental data and its high added value services 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...

Process - Emissions - Ambient Air monitoring solutions

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

- More than 35 000 air quality monitors are measuring the pollution of cities worldwide: Rio de Janeiro, Istanbul, Barcelona, Seoul, Mecca, Delhi, Moscow, Paris, Budapest, Mumbai, Abu Dhabi, Bangkok, Dakar, Beijing, Chongqing...
- Over 25 000 emission sources & processes are monitored worldwide across a broad range of industries, cement plants, glass manufacturing, metal factories, paper mills, engine manufacturers etc.

Faithful to the principles on which it was founded - innovation & quality, ethics & social responsibility, shared values & transparency - the group is committed to providing you with solutions and assistance at the highest standards.

