



SWAN ENVIRONMENTAL MONITORING SOLUTIONS

Emission
Monitoring

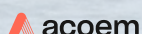
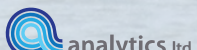
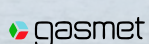
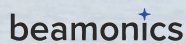
Process
Monitoring

Purity
Monitoring

Biogas
Monitoring

Leak
Detection

OUR GLOBAL PARTNERS



NPL Certified CEMS (NDIR)

- Measures : SO₂, NO_x, CO, CO₂, O₂.
- Shimadzu's latest switch-type ratio measurement technology for SO₂, NO_x, CO, CO₂. Galvanic/magnetic wind for O₂.
- User-friendly Human-machine interface.
- Self-check function for internal status.
- Records upto 1year data at a 10s rate
- Applications: Monitor exhaust gases from boilers, refineries, iron, steel, cement, industrial furnaces, large combustion devices, waste incineration plants etc.



SGA-900

UV DOAS / NDUV Based SO₂, NO, NO₂ Analyzer

- Extractive type emission analyzer for measurement of SO₂, NO, NO₂ gases.
- Based on UV DOAS / NDUV principle.
- Adopts the pulse source.
- NO & NO₂ can be measured at the same time, with converter.
- High accuracy & reliability: No cross interference between gases, Undisturbed by moisture and dust.
- Fast response time. Modular design. Low detection limit. Small drift.
- Long maintenance free cycle.



SGA-900-UV

TDLAS Gas Analyzer (Hot Wet Extractive CEMS)

- Based on TDLAS principle.
- Measurable gases: O₂, HF, CO, CO₂, CH₄, H₂S, NO, NH₃, N₂O, H₂O
- High-precision & fast response allows multi-point sampling and analysis.
- Ranges: ppb to atmospheric sat. levels
- PLC & Computer systems integrable.
- Applications: Extractive gas analysis, Lab. gas sensing, Industrial process monitoring, Explosion risk management, Mobile Analysis in Harsh Environments etc.



BeamCell®

In-Situ Flue Gas Analyzer

- Measures any two gases of: NO_x, SO₂, and NH₃.
- NO/NO₂ measurements without a NO_x converter.
- Utilizes Differential Optical Absorption Spectroscopy (DOAS) method, eliminating the need for calibration.
- Measures in 200~400nm (low UV) for high precision.
- US EPA (USA) and TUV (Germany) Certified.



DGA-X

QAL1 & NPL Certified CEMS (FTIR)

- Measures H₂O, CO₂, CO, N₂O, NO, NO₂, SO₂, HCl, HF, NH₃, CH₄, C₂H₆, C₃H₈ etc. Opt TOC (ZID), O₂ (Zr).
- Fourier Transform Infra Red (FTIR) principle
- Ideal to measure trace concentrations of pollutants from hot, wet and corrosive gas streams.
- Can be easily configured for new set of compounds.
- Fully automatic operation by Calcmeter™ software.
- Both data & alarm information can be transferred to other reporting systems in analog or digital format.
- Reliable system with low need for maintenance.



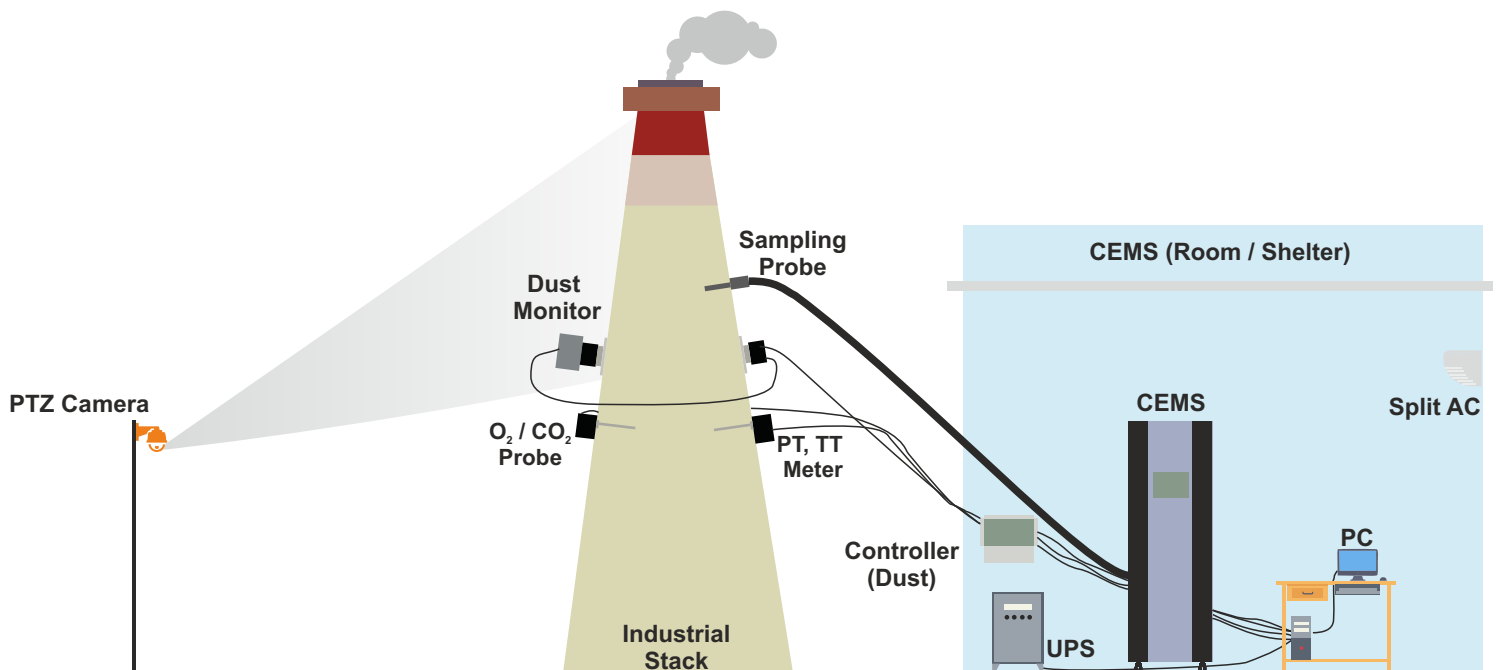
CEMS-IIe

QAL1 Certified CEMS Mercury Analyzer

- For measuring Hg continuously from hot, wet and corrosive gas streams.
- Cold Vapor Atomic Fluorescence (CVA) measurement principle.
- Lowest certified range: 0-5 µg/m³.
- Very low detection limit (ng/Nm³).
- No need for separate chemicals, concentrators, scrubbers, gases
- Fully automatic system. Quick response. Online results with Calcmeter™ software.
- In-built QAL3



Hg-CEMS

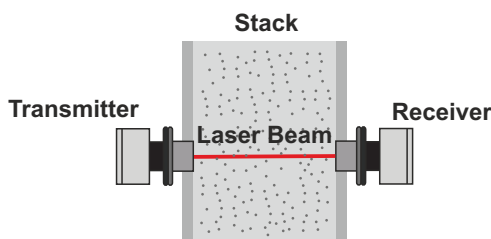


NPL Certified Single Pass Laser Dust Monitor

- For continuous stack dust measurement
- Based on the single pass measurement principle.
- Laser light source for ultimate Wavelength Stability.
- Excellent Collimation (0.04°) for accuracy and sensitivity.
- Stacks: 1m-10m. (optional lens for stacks upto 40m)
- Range: 0-90%.
- 4 selectable measuring ranges.
- Analogue and digital display.
- Settable alarm relay limit.



LM3189



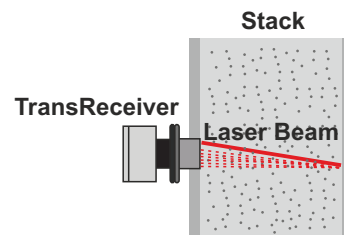
Single Pass

NPL Certified Back Scattering Dust Monitor

- Laser based backward scatter dust / particulate matter / smoke density monitor.
- Measure dust loading of combustion exhaust dry gas stream.
- Suitable for all regulatory OCEMS measurements and Bag Filter Monitoring.
- Range: 0 to 100, 500, 1000, 2000, 10000 mg/m³;
- Stack Diameters: 0.5m to 20m
- Flue Gas Temperature: Upto 600degC



iDustHawk-100



Back Scattering

Single Pass Optical Dust Counter

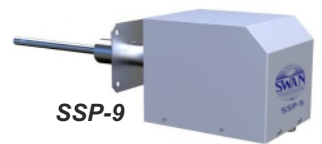
- Measures mass concentration of dust (0-100g/m³) and optical density (0-4) in the flue gases.
- Based on measuring losses of optical power of LED radiation passing through a gas duct.
- Gas duct diameter : 1-4m / 0.5-20m
- Blower to remove dust from lenses.
- Applications: flue gases of fuel-burning plants operated on any type of fuel.



SOM-16

Sampling Probe

- Special design adapts to multiple working conditions viz., high temperature, high dust, high humidity and strong corrosion, etc.).
- It can match with various sampling pipes, filter and heating unit.
- It owns advantages of large filtering area and capacity, good gas tightness, high filtering precision, dust leak proof design with patent, reliable operation, fast response, convenient installation and maintenance.



SSP-9

Temperature, Pressure & Flow-rate Integrated Monitor

- Optimal for low flowrate (1m/s~5m/s).
- Has high-precision micro differential pressure/static pressure sensor and special pitot tube.
- With automatic calibration and purge .
- User can set interval of purge/zeroing
- LCD display for user friendly human machine interface
- Applications: Optimal for low flow ; high temperature, high humidity and high dust in flue of boiler and furnace as well as exhaust duct of mine etc.



STPF-010

IR Flowmeter

- Continuously measures flow rate and discharge of gases emitted by fuel-burning plants operated on any fuel.
- Infrared cross-correlation principle
- Gas flow rate range: from 0.2 to 50 m/s
- Contact-free measurements.
- Straight sections of the gas duct before and after installation are not necessary.
- Operates even in hot smoke gases up to 1000°C, severely dusted environments etc.



IS-14.M

Ultrasonic Flowmeter

- Measures gas flow rate and velocity using ultrasonic signals
- Allows representative measurements of large diameter stacks using the cross-duct method
- Measuring Ranges: 0~50 m/sec
- Measurement Distances in: 1~50 m
- Gas Temperature: < +150 °C.



SCD-90

Pan Tilt Zoom (PTZ) Camera

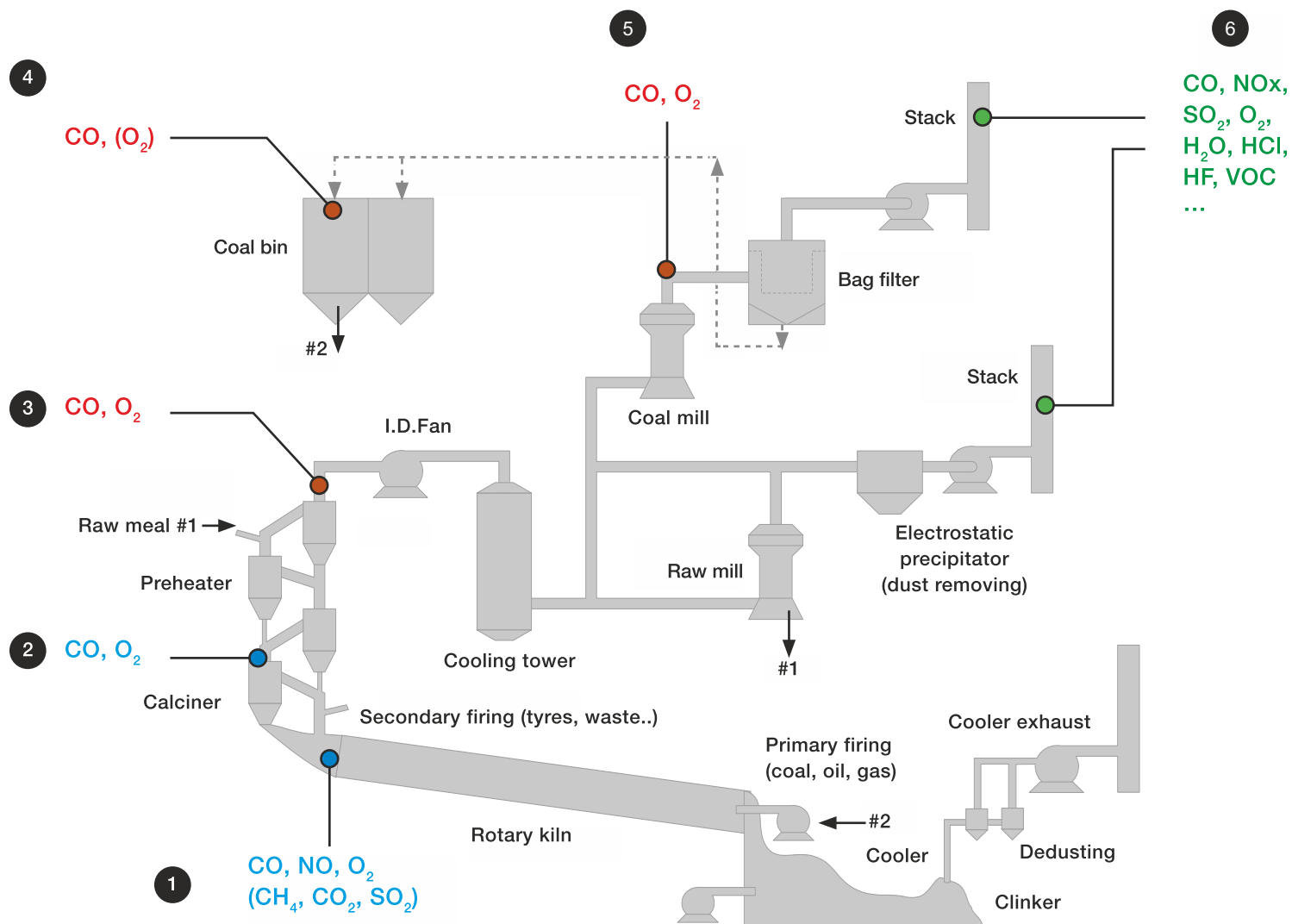
- Can rotate horizontally, tilt vertically, and zoom in on subjects.
- Starlight technology turns almost completely dark images into those of clear colors.
- Wide Dynamic Range (WDR) provides balanced lighting in partly dark and partly bright scenes.
- Regions of Interest (ROI) feature allows operator to monitor specific areas of a scene.
- Infrared light illuminates the scenes when it is too dark.
- IK10 vandal resistance tech for water, dust & shock protection.



CP-UNP-X Series

Industrial Process Monitoring Applications

Cement Manufacturing Process:



Applications, Advantages and Analyzers:

Measuring Point	Application	Advantages	Gases	Analyzers	Systems
1 : Process	Kiln gas outlet	1. Optimization of primary firing 2. Lower fuel consumption 3. Maintain clinker quality	1. CO, O ₂ , NO 2. CO ₂ 3. CH ₄ , SO ₂	URA 209	SGA 900
2 : Process	Calciner	1. Optimization of secondary firing 2. Lower fuel consumption	1. CO, O ₂	URA 209	SGA 900
3 : Safety	Preheater	1. Prevention of explosion in ESP 2. Control of false air in preheater	1. CO, O ₂	URA 209	SGA 900
4 : Safety	Coal bin	1. Prevention of smoldering (Monitor of air entrance)	1. CO, (O ₂)	URA 209	SGA 900
5 : Safety	Coal mill	1. Prevention of smoldering 2. Monitor of air entrance	1. CO, O ₂	URA 209	SGA 900
6.1. : Emission	Emission	1. Emission monitoring	1. CO, O ₂	URA 209	SGA 900
6.2. : Emission	Emission	1. Emission monitoring	1. CO, NO _x , SO ₂ 2. O ₂ , CO ₂ 3. HCl, TOC, HF	CX4000	CEMS IIe

ZrO₂ Oxygen Analyzers

- High quality zirconium sensors with reinforced platinum electrode layer.
- 4-key user interface controls all functions. Direct integration into plant control system.
- Low-temperature oxygen analyser - Combined Version: control unit integrated in probe. Ideal where access to the probe is easy, due to its lower cost and installation time.
- Low-temperature oxygen analyser - Separated Version: control unit connected remotely to probe. Ideal in places where access to probe is difficult. Up to 700°C /1292°F.
- High-temp. oxygen analyser (in-situ): In combustion processes up to 1250°C/2282°F. Variable lengths, protective covers to suit individual temperatures.



CO Monitoring in Economizer Outlet

- Highly accurate in-situ type CO & CO₂ analyzer
- NDIR principle.
- Robust, best suited for efficiency control at boiler.
- Applied Detector with high sensitivity.
- Simple optical path increases efficiency of optical transmission.
- It is equipped with air purge unit.



NPL Certified CO, CO₂, O₂ Analyzer

- Measures : CO and CO₂ (Switch-type ratio method) ; O₂ (Galvanic/magnetic wind method).
- User-friendly Human-machine interface.
- Self-check function for internal status.
- Records upto 1year data at a 10s rate
- Applications: boilers, refineries, iron, steel, cement, industrial furnaces, large combustion devices, waste incineration plants etc.



URA-209

Industrial Process Gas Analyzer

- MIDAC Titan FTIR spectrometer system.
- Auto analyze up to 60+ different compounds.
- 60 sample lines with user defined sequencing & automatic valving.
- Automated, Continuous and Robust.
- Valve control, sensor inputs, outputs to alarm, control devices are integrated into system.
- Applications: Process monitoring, QC of specialty gases, Facility air monitoring, Incineration & combustion processes.



TITAN-OL

Odorous Sulfur Compounds Monitor

- Monitor odorous sulfurs (H₂S, Mercaptans, Sulfides).
- GC - EC Wet Cell Detection.
- Automatic calibration/validation.
- Useful for Fence line, Fermentation process, Deodorization process, Fugitive emission.
- Intelligent system with tunable and interactive alarm levels.
- Remote monitoring & injection control.



TRSMEDOR

Portable Flue Gas Analyzer

- Gases: NO_x (NO/NO₂), SO₂, CO, CO₂ & O₂
- Principles: UV DOAS, TDLS, Para.
- Range: 0-75/1000 ppm, 0-500 ppm, 0-40 vol%, 0-25 vol%
- Direct measurement of NO and NO₂. Converter not required.
- Optional printer. Continuous or Mobile operated.
- Applications: QAL2 audit, Catalyst Efficiency, Combustion & Engine Emission etc.

MEMA-9D



Portable FTIR Stack Emission / Combustion Analyzer

- Measures H₂O, CO₂, CO, NO, NO₂, N₂O, SO₂, NH₃, CH₄, HCl, HF & VOCs.
- TUV certified.
- Sampling: hot & wet principle.
- PSS can also be equipped with ZrO₂ sensor for O₂
- Measures 50+ gases simultaneously.
- Results can be accessed via PC/tablet with Calcmeter software.
- With Calcmeter software identify unknown gases.



GT6000
Mobilis

Portable Stack Gas Analyzer - 4 or 8 Sensors

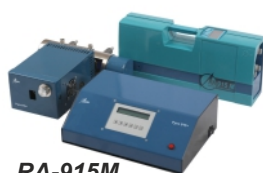
- Can be equipped with up to 4 or 8 sensors.
- Gases O₂, CO₂, CO, NO, SO₂ etc. other gases are customizable.
- Can optionally measure NO₂, H₂S, HC etc.
- Automatic zero calibration.
- Integrated self-check program.
- Illuminated display shows the parameters.
- Printer with programmable print out cycles.
- Rechargeable battery with charger.



IMR-1400/2800

Portable Mercury Emission Analyzer

- Measures total Hg (and speciation) in flue gas
- Sorbent trap method
- Range: 0.5 - 50,000 ng Hg absolute
- Fast on-site analyses (2-10 minutes per sample)
- No compressed gases
- Versatility: analyses of coal, ash, sludge, wastewater with the same analytical system



RA-915M

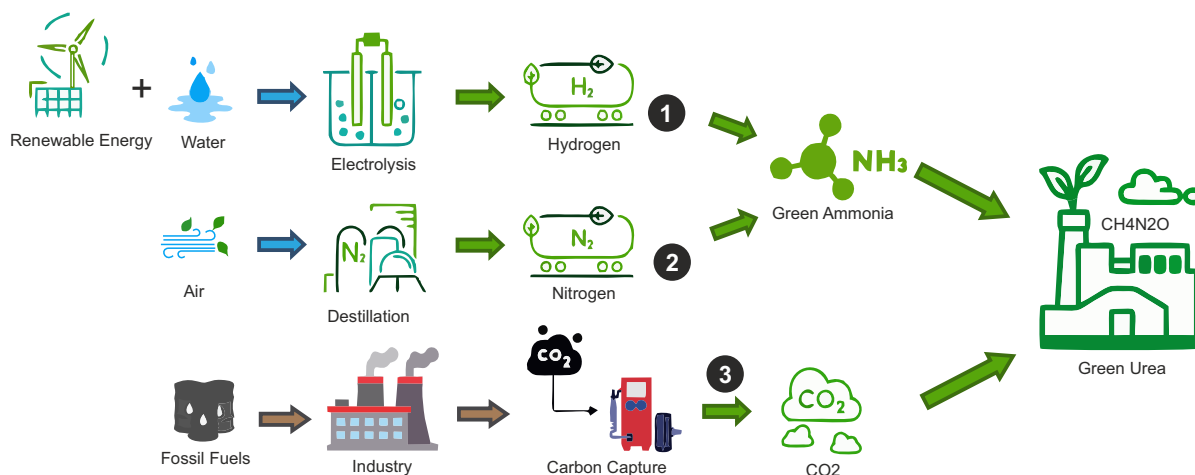
Portable Dust Monitor

- Based on Multichannel laser scattered light principle
- Range: 200µg/m³ - 250 mg/ m³
- Particle size : 0.04-10 µm.
- Can withstand media upto 500°C temperature & 80°C dew point.
- Displays numerical & graphical results on the touch display
- Data can be stored locally or on a separate USB stick
- Easy handling, low maintenance & an internal log function

SMG-200M



CO₂ To Green Urea (CTGU) Production Process:



Trace Impurities (H₂, N₂, Ar etc.) Analyzer

- Measures trace impurities (ppb/ppm) N₂, Ar, HeO₂, CH₄, CO, CO₂, NMHC, sulfurs, HCHO, NH₃, halogenated formic acid & H₂O in H₂.
- Integrated GC System for monitoring H₂ Purity.
- Meets ultra-high purity requirements for H₂ used in fuel cells (ISO 14687).
- Uses a combination of plasma emission detector, thermal conductivity detector and a quartz crystal moisture sensor.
- Applications: Electrolysis systems producing green H₂, Steam CH₄ reforming, Grey H₂ etc.

HyDetek



Rack Mountable FTIR Gas Analyzer

- Measures 50 gases simultaneously.
- 500 quantifiable and 5,000 identifiable gases (Incl. Amines).
- Heated sample cell for wet & corrosive gases.
- Software-based configuration: add gases or adjust setup without hardware changes.
- Selectable optical path length & pressure compensation option.
- Applications: Combustion & fuel research, Carbon capture & CO₂ purity, Process gas analysis and optimization, Raw gas analysis and gas treatment evaluation, etc.

GT7000
Tellus



Online Binary Gas Analyzer

- Based on thermal conductivity detection (TCD).
- Measurable gases: H₂, O₂, He, CO₂, N₂, Ar, CH₄, SF₆, NO₂, Ne, Kr, R125, D₂, O₂ (Optional).
- Extractive sampling.
- Measure Low-noise in trace range
- Cross-sensitivity compensation
- Modbus RTU via RS485 Communication
- Application: Gas Turbine

FTC320



Natural Gas Purity Analyzer

- Fusion Auto-Sensing Technology (FAST) coupled with MEMS TCD
- 1 ppm sensitivity.
- Rapid analysis, 1–3 minutes.
- Multiple module parallel analysis with fast temperature ramping.
- Web based user interface.
- Embedded Wi-Fi for control from computer & smart phone.

Micro GC Fusion®



Paramagnetic O₂ Analyzer

- Rugged, reliable and precise O₂ measurements in Process gases.
- Thermo-paramagnetic principle.
- Range: 0-50% or 20-100%
- IP66. Meets SIL2 requirements
- Applications: Hydrocarbon storage tank, Reactor blanketing, Process control, Natural gas monitoring, N₂/O₂ generator quality.

XTP601



In-Line O₂ Analyzer

- Measures O₂ concentration directly in process gas stream. No complex sampling systems.
- Solid State Ceramic Oxygen Sensor.
- Range: 0-25%
- IECEx and ATEX certified.
- Applications: For safety applications within chemical & pharmaceutical industries as sensor can be removed/replaced without opening process to ambient air.

OC-200



O₂ Purity Analyzer

- Long-life, conversion ion current tester with fast response and high sensitivity;
- Range upto 99.99%
- A standard RS232C interface;
- Custom Alarms
- Applications: High purity oxygen production, metallurgy, health, petrochemicals, power electronics etc.

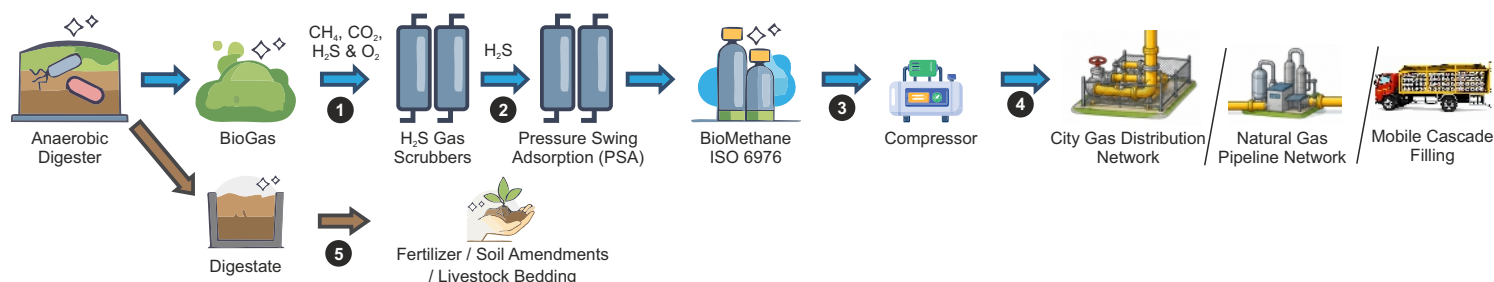


H₂ Purity Analyzer

- Range upto 99.999%
- Big LCD screen, concise menu
- Automatic data storage
- Setting upper and lower alarm values
- Applications: Measure H₂% in nitrogen separation from air, chemical process, magnetic materials such as high temp. sintering furnace gas protection, various mixed gases etc.



Biogas & BioMethane Production Process:



Online Biogas Analyzer

- CH₄, CO₂, H₂S and O₂ simultaneously
- NDIR (CH₄, CO₂) & ECD (H₂S and O₂)
- Output: 4-20mA output and RS232
- Modular sensors. Easy operation.
- Gas conditioning device to remove vapor and dust for analyzer's protection.
- Applications: Biogas/Biomethane plants, landfill sites, water treatment, sludge digestion, CDM project, Anaerobic digestion & other fermentation processes



Handheld Biogas Analyzer

- Measures CH₄, CO₂, H₂S and O₂ concentration (Optional: CO & H₂).
- Based on NDIR (CH₄, CO₂) and ECD technologies (H₂S, O₂, CO & H₂).
- Range: CH₄: 0-100%, CO₂: 0-50%, H₂S: 0-9999ppm, O₂: 0-25% (CO / H₂: 0-2000ppm).
- Rechargeable Lithium battery, 8h operation.
- In-built memory stores upto 2560 records.
- Applications: landfill, water treatment, CDM projects, anaerobic digestion & other fermentation processes.



SHH-BG 09

Biogas/Natural Gas/Mixed Gas Process Analyzer

- Gas Chromatograph (GC) principle.
- Measures upto 14 components in natural gas, biogas, gas mixtures, and hydrogen with impurities.
- Calculation of calorific value, standard density, heating value, density ratio, and Wobbe index.
- Automatic, regular calibration.
- Modular Systems. Touch Screen operation.
- Additional analog and digital inputs and outputs.
- Explosion proof housing for installation in Ex zone 1.
- Software gives reports in tables and chromatograms.



RGC-7

In-Line Biogas & RNG Process Analyzer - ATEX Cert.

- CH₄, CO₂, and H₂O vapor measurement.
- Excellent long-term stability and repeatability with proprietary infrared technology: no calibration gases needed.
- Direct installation into process: no sample treatment needed.
- Certified for Ex Zone 0/1.
- Probe heating eliminates condensation in wet processes.
- Corrosion-resistant SS housing (IP66).



MGP-261

Ultrasonic Bio-Gas Flowmeter

- All-in-one detect probe measures flow velocity, temp. & composition directly.
- Uses the latest ultrasonic transit-time differential method
- No routine maintenance Corrosion resistant.
- Few pressure losses, Reliable accuracy.
- Widely applied in industries of petroleum, chemical, electricity, metallurgy, urban gas supply etc.



SFM-BG 09

Online Syngas Analyzer

- Up to 6 gases viz., CO, CO₂, H₂, O₂, CH₄, C_nH_m, C₂H₂ and C₂H₄ simultaneously.
- Calculates gas heating value (caloric value) and N₂ balance.
- Adopts intl. advanced NDIR & TCD gas analysis technology.
- Modular sensors, Easy operation, Low maintenance.
- Bluetooth module & mobile App for Control & diagnosis.



SGA-SYN 09

Slurry / Mass Flowmeter

- Based on Coriolis Force principle.
- Strong anti-interference capabilities, ensuring high sensitivity and high range ratio.
- Various designs to suit various operating conditions.
- Explosion proof touch screen.



GCF-1000

Fixed Methane Leak Detector

- Uses Infra Red (IR) sensor.
- Easy operation with a magnetic bar.
- Large digital LCD display with a blue backlight.
- Explosive proof, Water/dust proof.
- Automatic calibration.
- 4-20mA / Digital output.



SI-100

Portable Methane Leak Detector

- Catalytic / NDIR principle.
- Range: 0 ~ 100 %LEL.
- Built in Pump, rechargeable Li-ion battery.
- IP67 : Dust proof, Water resistant.
- Provides real-time alerts through LED indicators, sound alarms, and vibration signals.
- Small size & Light weight.



MGT

Underground CGD Leak Detector

- Innovative gas detector system for easy survey of gas pipelines.
- Principle: Gas Chromatograph (GC) and IR-sensor combination.
- Sensitivity: 1 ppm to 100% Vol CH₄.
- Applications: Natural gas pipelines survey, Emergency situations, Landfill emission monitoring and Biogas and wastewater treatment plant leak and emission monitoring.
- Certified for use in Zone 0.
- No false alarms, high sensitivity, quick reaction & short recovery time.
- Innovative Survey System
- Route walked by the operator can be visualized on GIS using integrated GPS. Leaks can be pinpointed leaks with a minimum of bar holes. Integrated GPS chip allows reliable location tracking.
- Mono-Wheeler Carpet Probe: Walk on a curb
- Bell: Draw gas samples
- Flexible Extension: Search in hard-to-reach areas
- Bar Hole Probe: Perform bar hole tests



Acoustic & Thermal Imaging Camera

- Acoustic Principle: 176 digital microphones at 200 kHz.
- Thermal Principle: Uncooled microbolometer.
- Acoustic frequency range: 2 -100 kHz.
- Thermal spectral range: Longwave IR (8-14 μ m).
- With Night vision. IP54 waterproof
- Results on display in real-time at 100 acoustic images per second.
- Applications: Compressed air/gas/vacuum leak detection, Partial discharge detection, Condition-based monitoring, Non-destructive testing.



Drone Mount Gas Analyzer (Methane etc.)

- MIRA: Mid IR Laser Absorption Spectroscopy technology.
- Options:
 - Natural Gas: CH₄, C₂H₆, H₂O
 - Carbon Monoxide + Nitrous Oxide: CO, N₂O, H₂O
 - Carbon Dioxide + Nitrous Oxide: CO₂, N₂O, H₂O
 - Acetylene: C₂H₂, H₂O
 - Methane Only: CH₄, H₂O
- CH₄ Sensitivity: <2ppb/s
- Ultra-Lightweight (2 kg with battery). With Storage, GPS, Wi-Fi.
- Switch seamlessly between battery power & drone power.



VOC Mapper/Inspector

- Principle: TDLAS and high-res OGI camera.
- Swiftly visualize and locate leaks of methane, organic gases & VOCs. Detects 20 gases.
- Applications: Flammable and toxic gas leak detection, Latent fault detection, Petrochemical, Industrial vision systems, Aerial radiometric imaging, UAV integration.
- Laser ranging provides distance value.
- Wi-Fi, Bluetooth & GPS enabled. ATEX Cert.



Portable HydroCarbons Analyzer (LDAR) - FID

- Based on FID technology.
- To perform Method 21 inspections as well as other THC detection.
- Range: 0-1,00,000ppm.
- ATEX certified.
- Can be entirely controlled by a wireless hand-held device.
- Pump throttling maintains a consistent sample flow



Ex-Certified Hydrogen Leak Detector

- Sensistor sensor technology.
- Range: 0.5 ppm - 0.2% H₂.
- Applications: fuel cells, oxygen supply, fire extinguishing systems, hydrogen-cooled generators, pipes, valves, containers
- Intrinsically safe (Ex ia IIC T3), Battery operated (> 7hr/charge)



Handheld / Remote TDLAS Gas Analyzer

- Remotely detect & analyze gas leaks.
- Based on TDLAS principle.
- Gases: HF, CO, CO₂, CH₄, H₂S, NH₃.
- Range: 30m / 100m (with reflector).
- Drone / Portable / stationary setup.
- Applications: Hazardous Gas Monitoring, Environmental Surveillance, Gas Detection, Industrial Leak Detection, Remote Emissions Analysis.



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