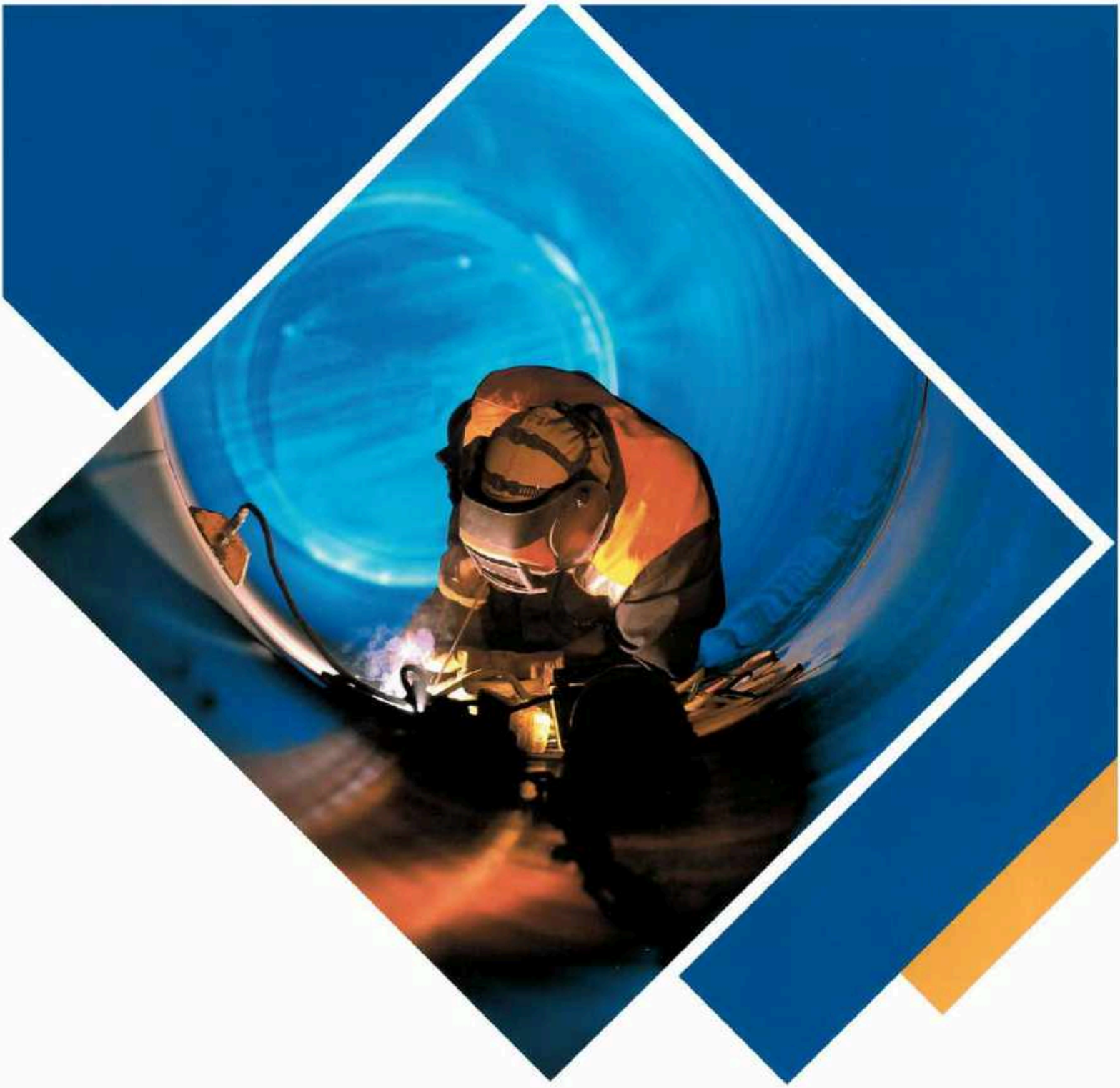


Products and Services Guide

Creating healthier and safer workplaces

CROWCON
Detecting Gas Saving Lives

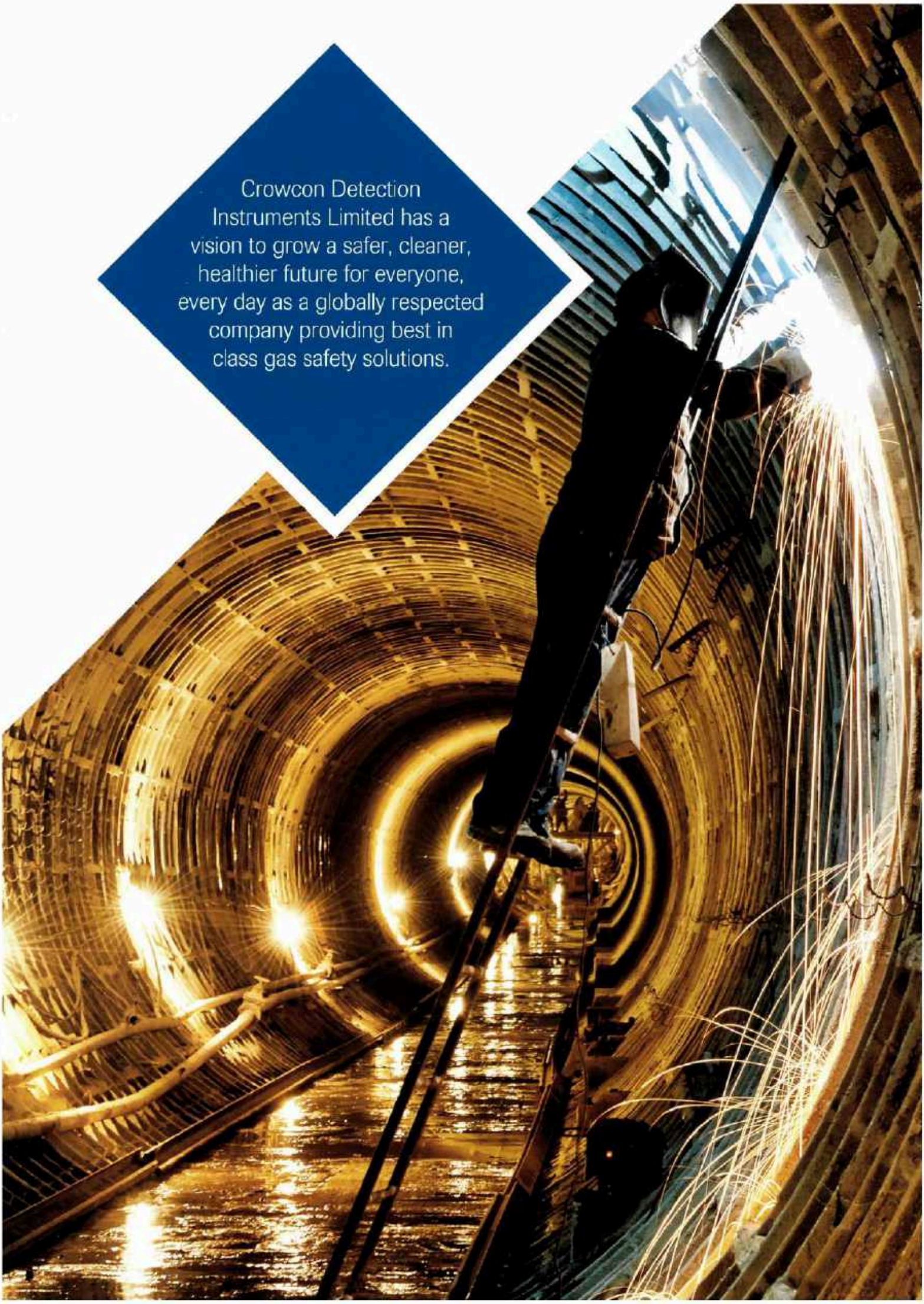
Our mission statement:

"To combine our expertise with emerging technologies to develop process insights & protection for our customers. Improving their operational efficiency and creating healthier & safer workplaces."

At Crowcon we recognise that no two implementations are the same. The environmental conditions, detection requirement, user interaction and the information needed to ensure safe and cost efficient deployment should all be considered. Focused on gas sensing solutions, we listen to the market and our customers, delivering solutions that reduce the amount of time people spend in potentially hazardous situations whilst improving operational efficiency.

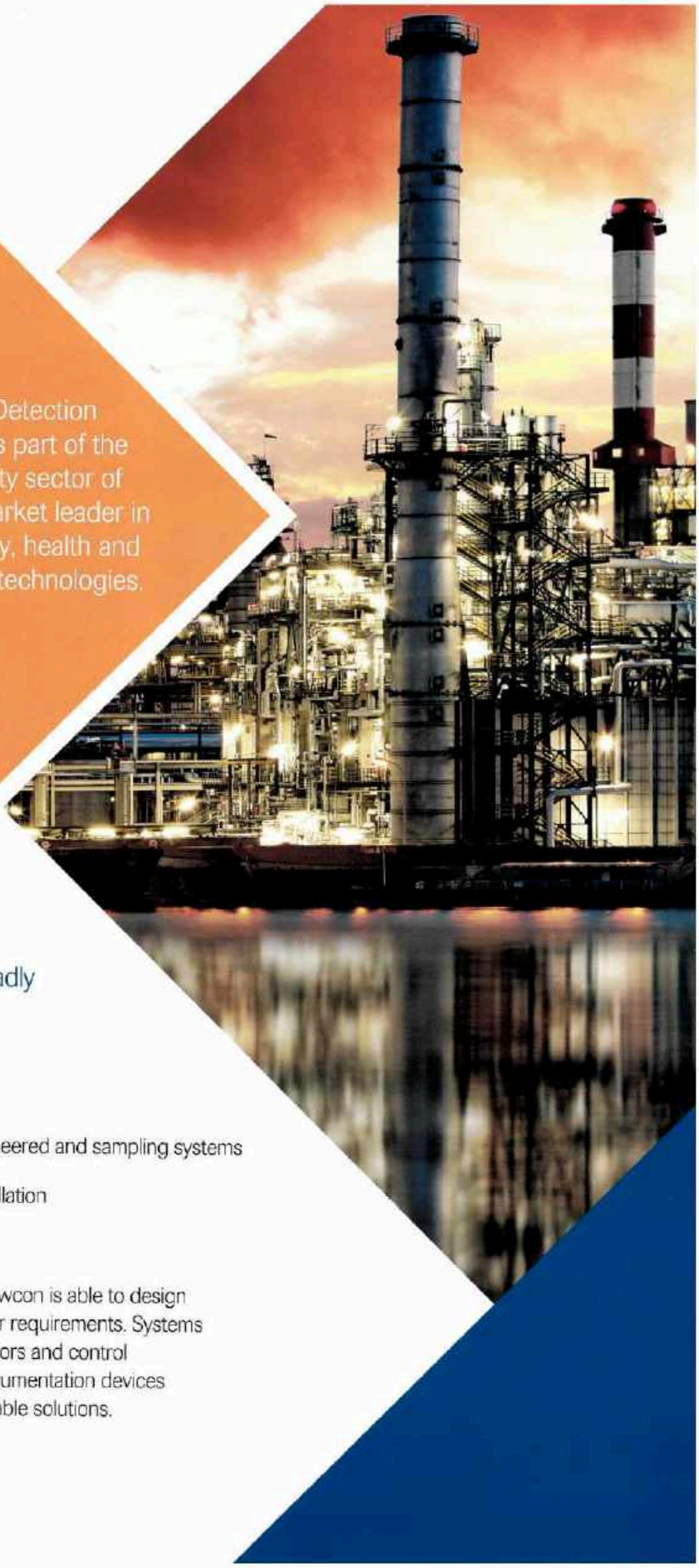
For almost 50 years, Crowcon has been developing and manufacturing high quality products with a reputation for reliability and technical innovation. The Crowcon portfolio offers both fixed and portable gas detection equipment and services based on a solid foundation of expertise in mechanical, electronic and software design and an understanding of the core physics and chemistry of gas detection.

Crowcon Detection Instruments Limited has a vision to grow a safer, cleaner, healthier future for everyone, every day as a globally respected company providing best in class gas safety solutions.



As well as our head office in Milton Park, Abingdon, UK; we have regional offices in the Netherlands, India, China, UAE, Singapore and the USA; supporting end customers and our network of channel partners.

Products are made in Abingdon using Lean and Six-Sigma production principles, in our manufacturing facility. This facility is accredited to ISO 9001:2015, BS EN ISO/IEC 80079-34:2011, ISO 14001:2015, ISO18001:2007 as well as passing regular audits by international bodies such as LRQA, BASEEFA, UL, CSA and Lloyds Register.

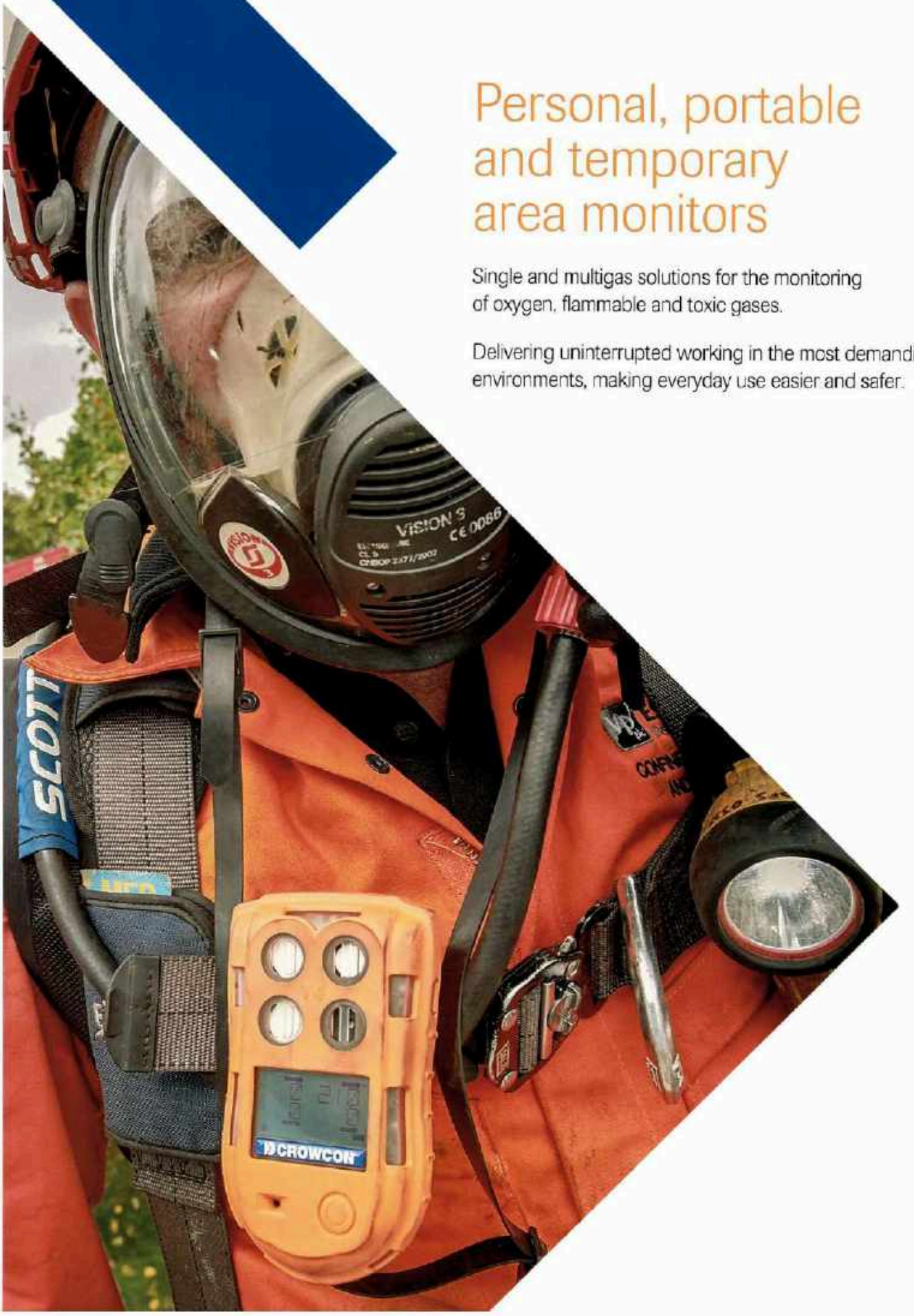


Crowcon Detection Instruments is part of the Process Safety sector of Halma plc, a market leader in specialist safety, health and environmental technologies.

The Crowcon business is broadly split into three key areas:

- Portable and personal monitors
- Fixed detectors, controllers, engineered and sampling systems
- Service, spares, training and installation

The Engineered Systems team at Crowcon is able to design bespoke systems to specific customer requirements. Systems are configured using Crowcon detectors and control panels and incorporate industrial instrumentation devices to provide cost effective and dependable solutions.



Personal, portable and temporary area monitors

Single and multigas solutions for the monitoring of oxygen, flammable and toxic gases.

Delivering uninterrupted working in the most demanding environments, making everyday use easier and safer.

Clip SGD

Capability:
1 gas

Target gases:
CO, H_2S, O_2

Sensing technology:
Electrochemical

Sampling:
Diffusion

Approvals:
ATEX, IECEx, cCSAus

Customer value:
2 year fixed life delivers low cost of ownership

Gasman

Capability:
1 gas

Target gases:
C_2H_4O, Cl_2, ClO_2, CO, CO_2*, $COCl_2$, F_2, H_2, HCN, HF, H_2S, NO, NO_2, NH_3, O_2, O_3, PH_3, SO_2, flammables

Sensing technology:
Electrochemical, pellistor, infrared*

Sampling:
Diffusion

Approvals:
ATEX, IECEx, CSA

Customer value:
Full function, rugged & compact. Extensive range of target gases

T4

Capability:
1 – 4 gases

Target gases:
CO, H_2S, O_2, flammables

Sensing technology:
Electrochemical, pellistor, flammables

Sampling:
Diffusion

Approvals:
ATEX, IECEx, UL, INMETRO, MED

Customer value:
Delivers compliance, offering unique TWA resume functionality

T3

Capability:
1 – 4 gases

Target gases:
CO, CO_2*, H_2S, HCN, NH_3, O_2, O_3, SO_2

Sensing technology:
Electrochemical, pellistor, infrared*

Sampling:
Diffusion

Approvals:
ATEX, IECEx, CSA

Customer value:
Top mount display for ease of viewing

Gas-Pro

Capability:
1 – 5 gases

Target gases:
Cl_2, ClO_2, CO, CO_2, H_2S, NH_3, NO, NO_2, O_2, O_3, SO_2, flammables, VOC

Sensing technology:
Electrochemical, pellistor, infrared, PID

Sampling:
Diffusion or pumped

Approvals:
ATEX, IECEx, UL, INMETRO, MED

Customer value:
CSE & PEC modes guide users through defined processes

Gas-Pro TK

Capability:
1 – 4 gases

Target gases:
CO, H_2S, O_2, flammables (%LEL & %vol)

Sensing technology:
Electrochemical, pellistor, infrared

Sampling:
Diffusion or pumped

Approvals:
ATEX, IECEx, UL, INMETRO, MED

Customer value:
Inert atmosphere monitoring including Tank Check mode

Detective+

Capability:
1 – 4 gases

Target gases:
AsH_3, C_2H_4O, Cl_2, ClO_2, CO, CO_2, F_2, H_2, H_2S, HCL, HCN, HF, NH_3, NO, NO_2, O_2, PH_3, SO_2, flammables, VOC

Sensing technology:
Electrochemical, pellistor, infrared

Sampling:
Diffusion or pumped

Approvals:
ATEX, IECEx (being clarified)

Customer value:
Perimeter monitoring wired or wireless, raised sensors prevent water ingress

LMm

Capability:
1 gas

Target gases:
CH_4 (specific)

Sensing technology:
TDLAS

Sampling:
Detection from distance

Approvals:
ATEX, IECEx

Customer value:
Locate leaks without the need to enter a potentially hazardous area

* Safe area use (not hazardous area certified)

Where 'flammables' are listed multiple calibrations are usually available (e.g. butane, propane, pentane) please check the website for further details

Fixed detectors, controllers and sampling systems

Crowcon offers a flexible range of products which are able to measure flammable, toxic and oxygen gases, report their presence and activate alarms or associated equipment. We use a variety of measurement, protection and communications technologies and our fixed detectors have been proven in many arduous environments, including oil and gas exploration, water treatment, chemical plants and steel mills.

They are used in many other applications where reliability, dependability and lack of false alarms are valued. These include within the automotive and aerospace manufacturing sectors, on scientific and research facilities and in high-utilisation medical, civil or commercial plants.

Xgard

Enclosure:
Stainless steel, Aluminium alloy, Nylon

Display:
No

Target gases:
AsH_3, B_2H_6, Br_2, C_2H_4O, Cl_2, ClO_2, CO, CO_2, $COCl_2$, GeH_4, F_2, H_2, H_2S, HCL, HCN, HF, NH_3, NO, NO_2, O_2, O_3, PH_3, SO_2, flammables (pellistor & IR)

Sensing technology:
Electrochemical, pellistor, infrared, PID

Output:
mA, mV

Relay:
No

Approvals:
ATEX, IECEx, UL

Customer value:
Comprehensive options providing cross-site compliance from a single platform

Xgard Bright

Enclosure:
Aluminium Alloy

Display:
Yes

Target gases:
CO, H_2S, O_2, flammables

Sensing technology:
Electrochemical, pellistor

Output:
mA, Hart, RS-485

Relay:
Yes

Approvals:
ATEX, IECEx, UL (pending)

Customer value:
Delivering reduced installation and maintenance costs

TXgard IS+

Enclosure:
Nylon

Display:
Yes

Target gases:
Cl_2, ClO_2, CO, $COCl_2$, H_2, H_2S, HF, HCN, NH_3, NO_2, O_2, O_3, PH_3, SO_2,

Sensing technology:
Electrochemical

Output:
mA

Relay:
No

Approvals:
ATEX, IECEx, UL

Customer value:
Delivering reduced installation and maintenance costs

Xgard IQ

Enclosure:
Stainless Steel

Display:
Yes

Target gases:
Cl_2, CO, H_2S, HF, NH_3, O_2, O_3, SO_2, flammables (pellistor & IR)

Sensing technology:
Electrochemical, pellistor, infrared

Output:
mA, Hart, Fieldbus, RS-485

Relay:
Yes

Approvals:
ATEX, IECEx

Customer value:
Remote and hot swap sensor options ensure optimal sensor placement and reduced maintenance times

IRmax

Enclosure:
Stainless Steel

Display:
Yes (optional)

Sensing technology:
Infrared

Output:
mA, Hart, RS-485

Relay:
No

Approvals:
ATEX, IECEx

Customer value:
Remote or localised display options ensure optimal sensor placement and reduced maintenance times

Open Path

Enclosure:
Stainless Steel

Display:
1 gas

Target gases:
Flammables

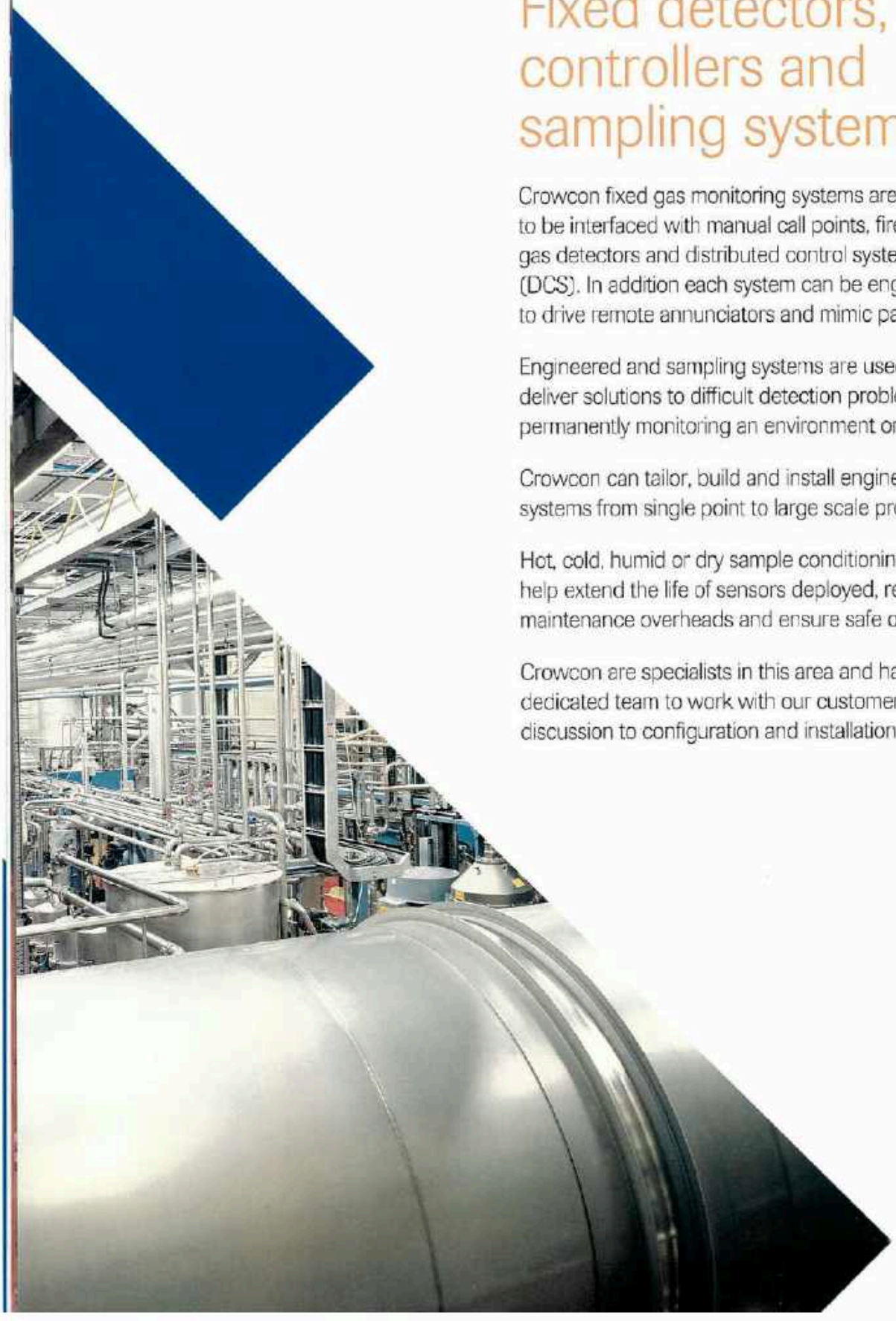
Sensing technology:
Infrared (open path)

Output:
mA, Hart

Relay:
No

Approvals:
ATEX, IECEx, UL

Customer value:
Fast detection of combustible gases and vapours over a line-of-sight up to 200m long



Fixed detectors, controllers and sampling systems

Crowcon fixed gas monitoring systems are designed to be interfaced with manual call points, fire and gas detectors and distributed control systems (DCS). In addition each system can be engineered to drive remote annunciators and mimic panels.

Engineered and sampling systems are used to deliver solutions to difficult detection problems for permanently monitoring an environment or process.

Crowcon can tailor, build and install engineered fixed systems from single point to large scale projects

Hot, cold, humid or dry sample conditioning can help extend the life of sensors deployed, reduce maintenance overheads and ensure safe operation.

Crowcon are specialists in this area and have a dedicated team to work with our customers from initial discussion to configuration and installation support.

Gasflag

Channel input:
1 input

Input:
mA

Output:
No

Event logging:
No

Battery backup:
No

Relay option:
Yes

Approvals:
None

Customer value:
Compact and standalone monitoring with onboard audible and visual indicators

Gasmaster

Channel input:
1-4 input

Input:
mA, mV, Fire

Output:
mA, RS-485

Event logging:
Yes

Battery backup:
Yes

Relay option:
Yes

Approvals:
ATEX: May be used in a non-hazardous area as part of an Intrinsically Safe System

Customer value:
Large display delivers user friendly system status and maintenance functionality

GM16 & GM64

Channel input:
1-128 input

Input:
mV, mA, RS-485

Output:
mA, RS-485, TCP IP

Battery backup:
Yes

Approvals:
May be used in a non-hazardous area as part of an intrinsically safe system.

Customer value:
Addressable solution reducing installation cabling requirements delivering reductions in time and cost

Vortex

Channel input:
1-12 input

Input:
mA, mV, fire

Output:
RS-485, Profibus

Event logging:
Yes

Battery backup:
Yes

Relay option:
Yes

Approvals:
ATEX: May be used in a non-hazardous area as part of an Intrinsically Safe System

Customer value:
Flexible control package for single or multi-controller requirements

Gasmonitor Plus

Channel input:
1-16 input

Input:
mA, mV, fire

Output:
mA

Battery backup:
Yes

Relay option:
Yes

Approvals:
ATEX: May be used in a non-hazardous area as part of an Intrinsically Safe System

Customer value:
Rack based system offers the ability to engineer complex systems from standard controllers

Crowcon HMI

Channel input:
1-6 Vortex or 1-10 Gasmaster

Input:
Ethernet

Battery backup:
Yes

Output:
None

Relay option:
Visual and Audio

Approvals:
None

Customer value:
Remote visibility of multiple controllers

Single-point sampling monitoring system:

1. The single-point system is mainly used for analyzing gas samples collected in the pipe lines or during the processes.
2. A powerful high-flow pump draws gas into the system, pre-treated to remove dust and water, treated gas enters the gas sensor compartment for concentration detection and exhaust gas is discharged.
3. The system uses a flow and error monitoring unit to monitor running condition of the system at all times.
4. The system adopts a programmable timer to control the times for sampling and back purging. The current working mode is displayed and the times for sampling and back purging are adjustable.
5. Optional controller provides gas concentration display warnings and error indications, relay output, 4-20 mA output for every sensor and communication with RS-485 buses.
6. The system can provide 4-20 mA signals and fault relay output .

VOC Sampling and Monitoring

Single-point sampling monitoring sysem can be used for environmental sampling of Volatile Organic Compounds (VOCs) including:

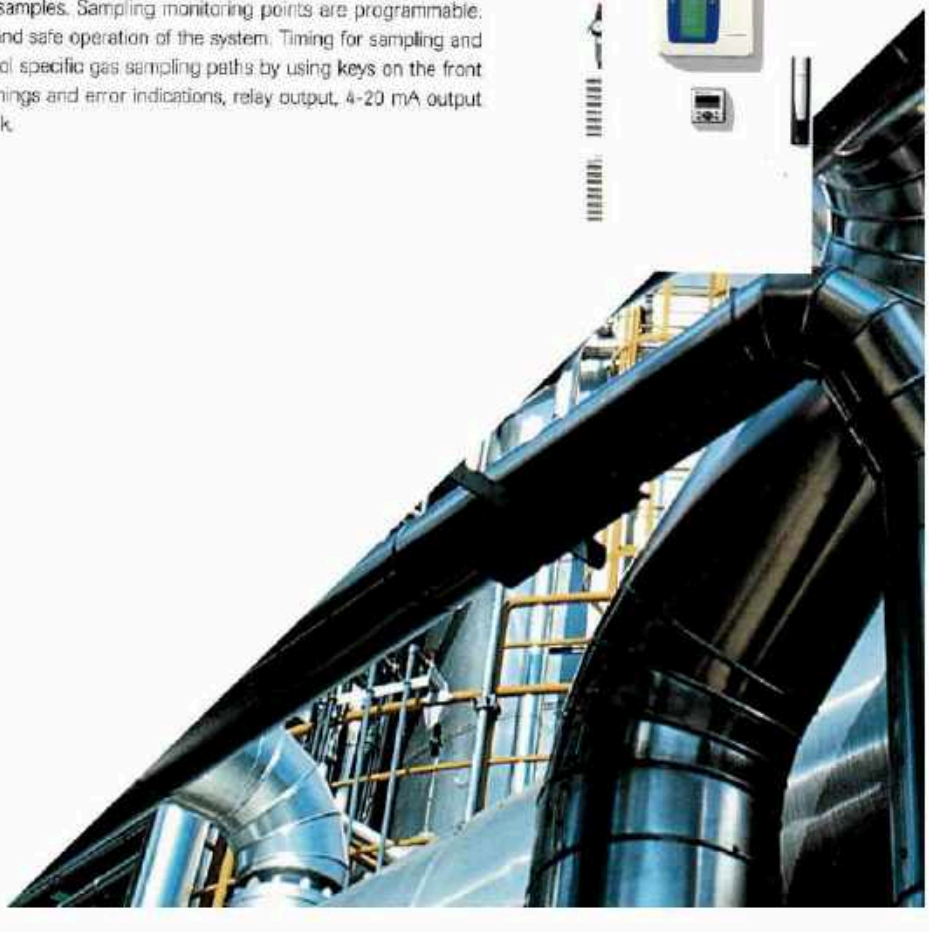
Aromatic class	A series of compounds containing benzene rings, such as benzene, toluene, ethylbenzene, xylene, etc.
Ketones and aldehydes	Compounds containing C = O bond, such as acetone, butanone (MEK), formaldehyde, acetic acid, etc.
Ammonia and amines	Hydrocarbons containing N, such as dimethylamine diethylamine, etc.
Halogenated hydrocarbons	Such as trichlorethylene (TCE), perchlorethylene (PCE), thiohydrocarbons, etc.
Unsaturated hydrocarbons	Olefins, butadiene, isobutylene, etc.
Inorganic gases not containing carbon	Ammonia, arsenic, selenium, bromine, iodine, etc.
Semiconductor gas	Arsine (arsine), phosphine (phosphorus burning), etc.
Alcohol isopropyl alcohol (IPA), ethanol, etc.	
Non-methane total hydrocarbon	

Explosion-proof sampling monitoring system:

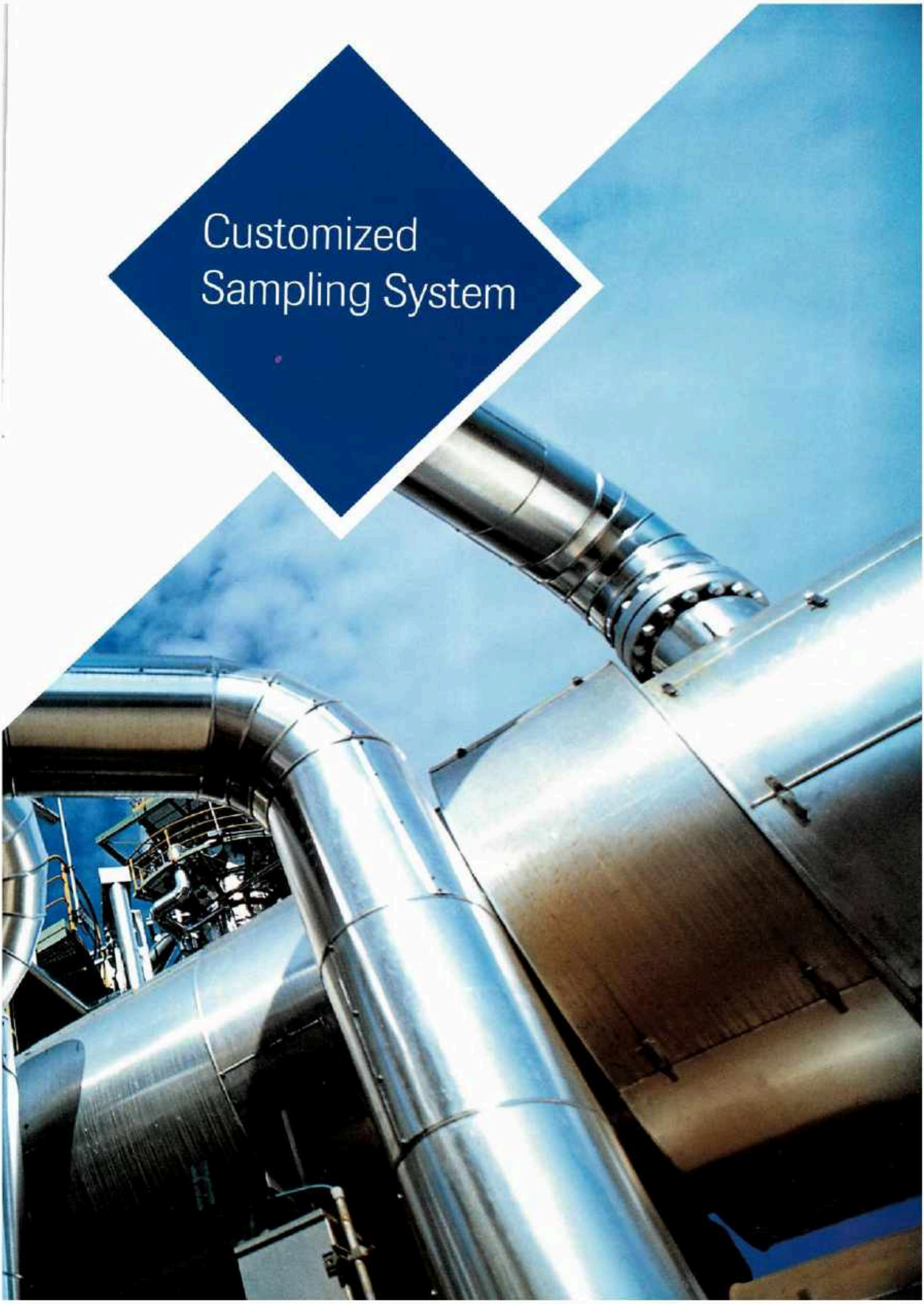
1. The environment sampling system uses a vacuum valve to drive gas sampling and can be used for Zone1 or Zone2 dangerous areas.
2. The fixed explosion-proof gas probe of the environment sampling system can be used to detect flammable gas, poison gas and oxygen.
3. Every probe can output 4-20 mA analog signals.
4. When the sampling flow is low or the sampling pipe is blocked, the built-in intrinsically safe flow meter will send fault signals.
5. The system can monitor contents of flammable gas accumulated closed space, dyes, volatile gases in printing or oxygen deficiency in industrial processes.

Multiple-point programmable sampling monitoring system:

Multiple-point system can monitor up to 32 paths of gas samples. Sampling monitoring points are programmable. Filter and flow monitoring unit in the system ensure stable and safe operation of the system. Timing for sampling and back purge are adjustable. Users can select time and control specific gas sampling paths by using keys on the front panel. A controller provides gas concentration, display warnings and error indications, relay output, 4-20 mA output for every sensor, and communication via RS-485 MOBUS link.



Customized Sampling System

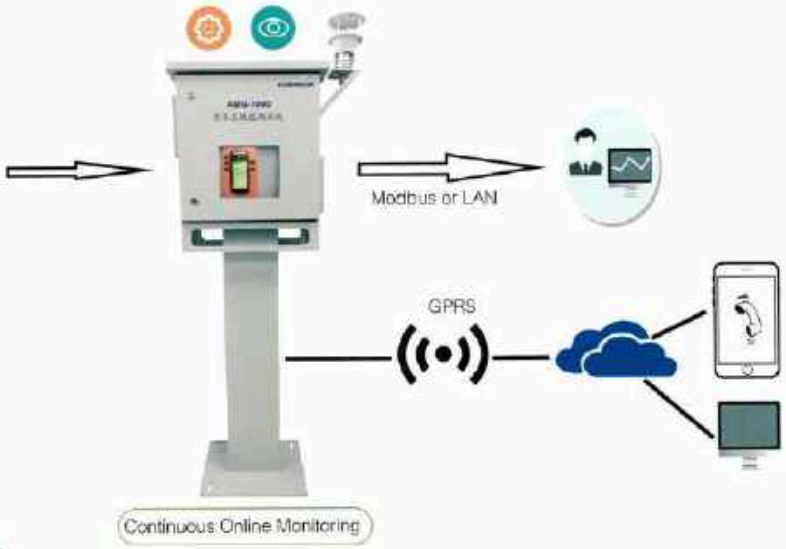


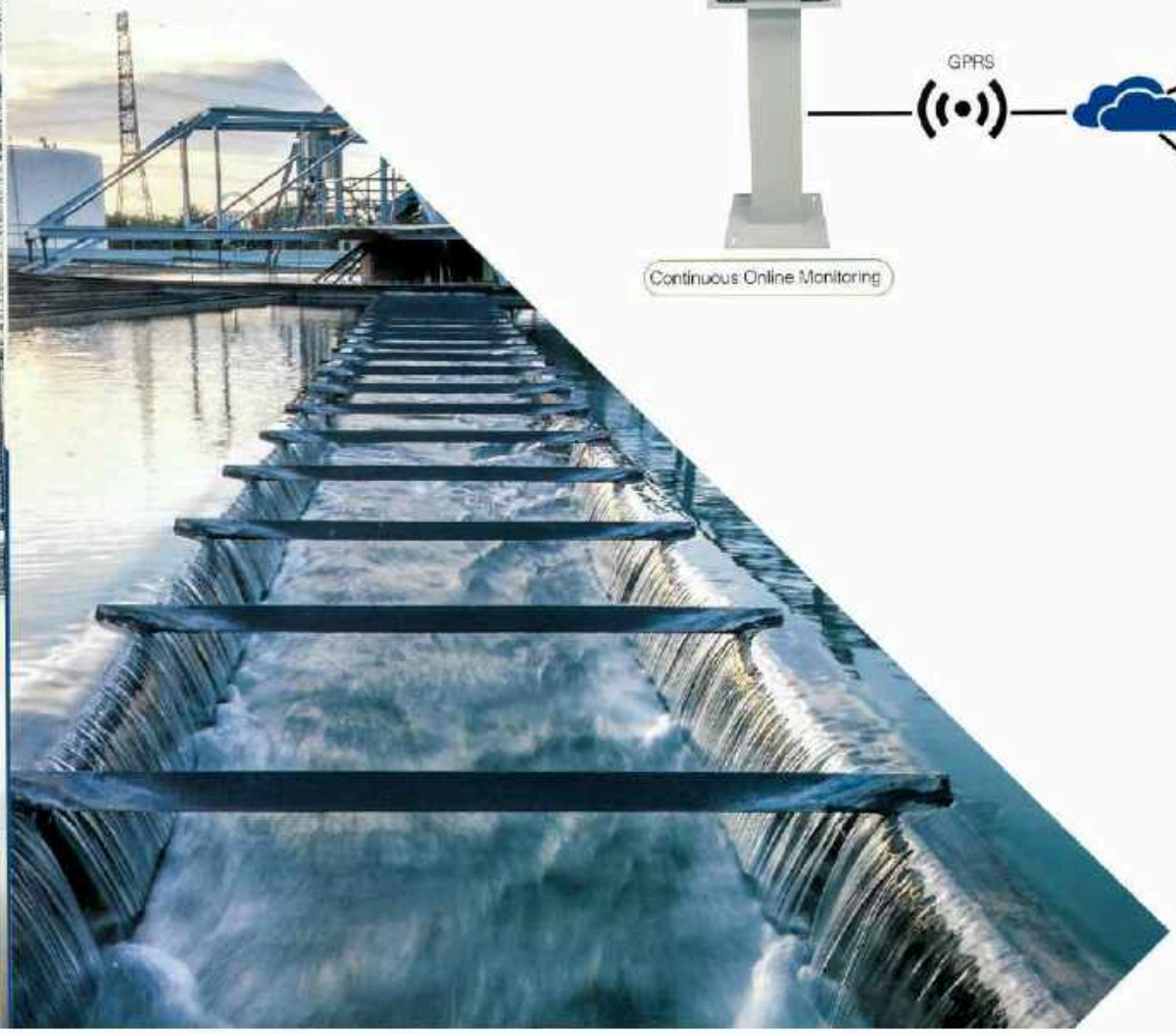
Odour monitoring System AMG-1000

Suitable for detection of multiple mixed gas concentrations in various environments

Application:

- Industrial parks
- Municipal facilities
- Sewage and sludge treatment plant
- Animal husbandry farm
- Refuse landfill, incinerator plant





Specifications

1. Sensor Tray

Detection of odor concentration, hydrogen sulfide, ammonia, methyl mercaptan and other gases. Optional weather station to record temperature, RH, atmospheric pressure, wind and direction

Configurable according to customer requirement

2. Sampling line

Anti-corrosion design to ensure no corrosion and adsorption of gas

Automatic pressure relief protection function to avoid pressure from causing error in reading due to changes in pressure.

3. Display

Real-time monitoring data

LED indicator indicates the working state of the system

Automatic cleaning function with configurable frequency and duration of cleaning

4. Communication Protocal

Modbus communication protocol with remote reset and configuration function.

GPRS wireless module configuration with optional cloud data storage

Output includes real-time concentration, system working state and other parameters. Optional trending report and output file.

5. Battery backup

Complete with current leakage and a surge protector

Seamless power supply switch to ensure uninterrupted power supply of the system

Built-in large-capacity battery to ensure uninterrupted detection in case of a power failure (up to 2 hours)

Optional solar power supply system, suitable for an open-air environment without power supply

Gas Auto Sampler Specifications

Built to the requirements of Emission Standards for Odor Pollutants and Triangle Odor Bag Method to sample gases round-the-clock.

Sample in real time and can be controlled via wired or wireless method.

Stand alone installation or be used in combination with the AMG-series odor detectors.
After the AMG odor detector detects that the odor concentration exceeds limit, it can keep the required sample over site samples exceeding the standards through background control.

Built-in overpressure interlock cut-off device can prevent the sampling bag from being damaged due to excessive pressure

Specially-designed rain-proof damp-proof housing can be vertically mounted or wall-mounted

Control functions through an industrial PC

Built-in 10L special sample bag to complete sample keeping within 30 seconds to avoid environmental interference

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