



# Gas Analysers and Systems

 **COOPER** Crouse-Hinds



Process gas  
analysers for  
safe and  
hazardous area  
applications

# Gas Analysers and Systems



Hitech Instruments has been specialising in gas analysers for over 30 years. All the design and manufacture is done in the UK. In 2009 Hitech moved into the new purpose built facility of their parent company MTL (Measurement Technology Ltd). MTL is part of Cooper Crouse-Hinds, a Cooper Industries company.

Application specific analysers are the forte of Hitech. Rather than modify an existing product Hitech have designed application specific analyser solutions for power stations, the chlor alkali industry and biogas plants. This approach ensures that every component is chosen for the job and performs accordingly.

Hitech manufacture zirconia and thermal conductivity sensors in house. Thus each sensor is characterised individually. Electrochemical cells are conditioned in house and, in some cases, modified according to the application. As manufacturers of both sensors and analysers, Hitech maintain full control over the production process.



When it comes to katharometer (thermal conductivity) technology Hitech is an international leader. Subtle variations in manufacture lead to an array of sensors suitable for a multitude of gases and applications.

As part of the MTL Instruments group Hitech has access to an unrivalled database of knowledge of hazardous areas. All MTL hazardous area, surge protection and wireless technology products are available to complement Hitech analyser systems.

A member of the MTL Instruments Group

O<sub>2</sub> H<sub>2</sub> CO<sub>2</sub> CH<sub>4</sub>  
 SF<sub>6</sub> H<sub>2</sub>  
 Kr Xe He  
 Ne CO O<sub>2</sub> H<sub>2</sub>



- 4 Biogas analysers
- 5 Hydrogen analyser for chlor alkali plants
- 5 Hydrogen purity and purge gas analysers for power stations
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- 10 Combined oxygen and carbon dioxide analyser
- 11 MAPtest, food packaging analyser
- 12 OEM sensors for oxygen and katharometers
- 13 Sample conditioning systems
- 14-15 Intrinsic safety solutions, wireless connectivity, surge protection

#### Measured Gases

Ammonia	NH <sub>3</sub>
Argon	Ar
Carbon Dioxide	CO <sub>2</sub>
Carbon Monoxide	CO
Chlorine	Cl <sub>2</sub>
Hydrogen Sulphide	H <sub>2</sub> S
Helium	He
Hydrogen	H <sub>2</sub>
Krypton	Kr
Methane	CH <sub>4</sub>
Neon	Ne
Oxygen	O <sub>2</sub>
Sulphur Hexafluoride	SF <sub>6</sub>
Xenon	Xe

Bespoke solutions from gas analyser experts backed by years of experience

# Application specific analysers

Hitech do not just adapt analysers for a specific application, they start from the beginning. When you buy an application specific analyser from Hitech you can be sure that each sensor, component and sample system has been chosen for a reason. The result – low maintenance systems, maximum sensor life and analyser accuracy.

## GIR5000 Biogas Analyser

### APPLICATIONS

- Landfill gas monitoring
- Digester gas analysis
- Flare stack monitoring
- CDM verification
- Biogas purification
- CHP engine protection and efficiency



The GIR5000 series analysers are ideal for biogas applications. These gases are usually a mixture of methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) together with oxygen (O<sub>2</sub>) and hydrogen sulphide (H<sub>2</sub>S) which have implications for efficiency and safety. Two or three gas versions are available in a variety of configurations and all are ATEX certified.



Many configurations available

## KK650 Hydrogen and Chlorine Analyser

- Proven technology from the katharometer experts
- Unique dual sensor technology
- Works during start-up
- Benign, surrogate gas calibration
- Low maintenance
- Low cost of ownership



The KK650 is designed to measure hydrogen and chlorine at all stages of the chlorine manufacturing process – ‘wet’ chlorine, ‘dry’ chlorine and tail gas - even during start-up. A sample conditioning system is necessary for the ‘wet’ chlorine application. The complete system has a low calibration requirement and no consumables or spares in the first two years operation.



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## Hydrogen Purity and Purge Gas Analysers

- Triple range analysers
- Fixed or portable solutions
- Hazardous area options
- Very low cost of ownership
- Optional sample systems



The **K1650** and **K6050AP** hydrogen purity and purge gas analysers have been designed especially for power stations. The three range analysers measure hydrogen purity when the turbogenerator is running and monitor both stages of the purge cycle (H<sub>2</sub> – CO<sub>2</sub> – air) before and after shutdowns. Alternative solutions are available if nitrogen is used as purge gas. All your turbine gas analysis requirements in one package from the katharometer experts.

# Oxygen analysers

Hitech oxygen analysers use either zirconia or electrochemical cells to cover a wide range of applications. Zirconia sensors are non-depleting, fast responding and offer greater accuracy at low ppm levels. Electrochemical cells offer a cost effective solution over a wide range. A choice of cells is available to cover a wide range of applications.

## Z130 Zirconia Oxygen Analyser

- Rack mount for easy installation
- Fast response, integral sensor
- ppm to % O<sub>2</sub> levels
- Non-depleting, long life sensor
- Choice of sample systems



### APPLICATIONS

- Nitrogen generators
- Inert gas systems
- Air separation
- Soldering systems
- Reflow ovens
- Packaging

The rack mount design of the Z130 is ideal for analyser cabinets. For customers wishing to mount several instruments together, the 19" rack mount configuration provides an elegant solution. The Z130 features an integral sensor, flowmeter and needle valve as standard. To maintain fast response with long sample paths, a bypass flow sample system is available as an option. An internal pump option is available if low flow is an issue and a constant pressure system is another option.



Different sample systems available

## G1010 Oxygen Analyser

- ppm to % O<sub>2</sub> levels
- Hazardous area options
- Choice of cells for different applications
- Remote or integral sensor
- Choice of sample systems

### APPLICATIONS

- Nitrogen generators
- Furnace atmospheres
- Gloveboxes
- Inert gas systems
- Landfill/digester gas
- Quality Control
- Air separation
- Gasification/syngas
- Packaging

The G1010 series of oxygen analysers have a large number of applications measuring oxygen in various processes. From ppm to % levels, safe areas or hazardous areas, different process conditions and differing backgrounds there is a G1010 configuration that is right for you. Options include a choice of outputs, AC or DC versions, as well as the oxygen cell and sample system.



## Z1030 Zirconia Oxygen Analyser

- Fast response sensor
- Non-depleting, long life sensor
- ppm to % O<sub>2</sub> levels
- Bi-directional RS232

The competitively priced Z1030 is a compact panel mount analyser. The sensor is supplied in a remote housing complete with flowmeter and valve giving more versatility to the user. The analyser features bi-directional RS232 allowing remote calibration and datalogging. There is a choice of user programmable outputs and alarms.



## Z230 Zirconia Oxygen Analyser

Choose the Z230 for versatility and portability. This benchtop analyser is a fully self contained unit with integral sensor and pump (optional). The carrying handle makes it easily transportable and the integral flowmeter and valve mean there are no further accessories or consumables to carry around. The analyser features bi-directional RS232 allowing remote calibration and datalogging. There is a choice of user programmable outputs and alarms. The internal pump option is chosen if there is insufficient pressure in the sample stream and, for applications where a long sample path is involved, a bypass flow sample system enables faster results.



# Katharometers

Hitech katharometer (thermal conductivity) analysers are ideal for measuring % levels of one gas in a binary or pseudo-binary mixture. For example, air is composed of many gases but in a known, fixed ratio, therefore hydrogen in air is a pseudo-binary mixture and can be measured with a katharometer. Hydrogen, helium, dissociated ammonia, sulphur hexafluoride and noble gases such as krypton and xenon are all well suited to this technique. In particular, katharometers are perfect for gases which have no dedicated sensor and provide cost effective analysis solutions.

A compensation input supplied from other gas analysers is possible using a 4 to 20 mA input facility. This extends the capability of the analysers to measure in more complex mixtures. All versions are available with a 0 – 100% range. Dependent on the measured and background gas, 0 – 20% and 80 – 100% ranges are also available. Hydrogen analysers are usually available with a 0 – 5% range. Multi-range instruments are sometimes available on request.

## Ex d K1550FX Analyser for Hazardous Areas

- Proven technology from the katharometer experts
- Hazardous area options
- Corrosive gas sensor options
- Non-depleting sensor, no consumables
- Fixed and variable compensation options



The K1550FX analyser is supplied complete with remote sensor housing including flowmeter and valve together with an MTL zener barrier for mounting in a safe area with the analyser electronics. Alternatively, for full hazardous area use the electronics can be housed in an Ex d enclosure with remote keypad (pictured above).



Enquire about gases not listed



## K1550FX Panel Mount Analyser (Hazardous Area) K1550R Panel Mount Analyser (Safe Area)

### GASES MEASURED INCLUDE

- Hydrogen (H<sub>2</sub>)
- Xenon (Xe)
- Helium (He)
- Dissociated ammonia (NH<sub>3</sub>)
- Krypton (Kr)
- Sulphur hexafluoride (SF<sub>6</sub>)

All versions are available with a 0 - 100% range. Dependent on the measured and background gas, 0 - 20% and 80 - 100% ranges are also available. Hydrogen analysers are usually available with a 0 - 5% range. Multi-range instruments are sometimes available on request. Different sample conditioning systems are available, standard or bespoke, according to the process conditions. For corrosive gases a variety of material compatible sensor assemblies and fittings are available. Hitech are ready to recommend complete sample conditioning systems on receipt of full gas stream specifications.



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## K6050 & KG6050 Portable Analysers

### GASES MEASURED INCLUDE

- Hydrogen (H<sub>2</sub>)
- Helium (He)
- Argon (Ar)
- Oxygen (O<sub>2</sub>)
- Sulphur hexafluoride (SF<sub>6</sub>)

The K6050 and KG6050 are true portable, process analysers. The rechargeable battery has been chosen so that it will last longer than a full shift (with pump off). Extended operation is possible by running the analyser with the battery charger connected. The analysers are supplied complete with built-in sample pump, a flowmeter and control valve. The KG6050 includes an oxygen sensor as well as a katharometer, thus widening the range of applications.



# NDIR Sensor Analysers

Non-dispersive Infrared (NDIR) sensors are simple spectroscopic devices often used for gas analysis. The key components are an infrared source (lamp), a sample chamber or light tube, a wavelength filter, and an infrared detector. The gas is pumped into the sample chamber and gas concentration is measured electro-optically by absorption of a specific wavelength of infrared (IR) light.

## GIR250 Oxygen and Carbon Dioxide Analyser

### APPLICATIONS INCLUDE

- Respiration studies
- Fermentation monitoring
- Douglas bag analysis
- Sports science
- Food transportation



The GIR250 is designed to monitor percentage levels of oxygen and carbon dioxide in a single, robust unit. Oxygen is measured with a special electrochemical cell which works in the presence of mildly acidic gases such as carbon dioxide. The carbon dioxide is measured by NDIR sensor. A dual display gives 0.01% resolution on each gas. The instrument can be pre-programmed with pass/fail criteria for each of the gases and results can be transferred to external recording/logging devices using the 4-20mA outputs.



See page 4 for biogas analysers

## IR600 Wall Mount Analysers

### GASES MEASURED

- Methane (CH<sub>4</sub>)
- Carbon dioxide (CO<sub>2</sub>)
- Carbon monoxide (CO)

### APPLICATIONS

- Gas mixing
- Biogas monitoring
- Composting
- Fermentation
- Respiration studies
- Gasification
- Food processing

The easy to use, IR600 analysers come as a complete package with built in sample pump, inlet filter and temperature compensation, making the analyser “plug and play” for a wide range of applications. The non-depleting sensor has a long life and infrequent calibration requirements resulting in a low cost of ownership.



## IR4030 Portable CO<sub>2</sub> Analysers

- IP65 weather proof case
- Non-depleting sensor, no consumables
- Dual wavelength for stability and accuracy

The IR4030 features outputs and alarms. The standard output is 0-1V and fully programmable over the range of the analyser. Two alarms for indication can be programmed for concentration, function and hysteresis. The on-board hydrophobic filter will withstand normal conditions but for more ‘dirty’ or wet applications an additional external filter can be added.



## MAPtest 3050 Food Packaging Analyser

- Suitable for all O<sub>2</sub> – CO<sub>2</sub> – N<sub>2</sub> mixtures
- Auto calibration
- Choice of sampling
- Datalogging and download software

The MAPtest 3050 analyser is ideal for all Modified Atmosphere Packaging (MAP) applications. A choice of sampling methods is provided. The built-in pump can be used to withdraw a sample from a pack using the probe supplied, alternatively a manual sample can be taken by syringe and injected into a septum sample port. The MAPtest 3050 is supplied with a complete set of accessories and consumables for both sampling methods.



# OEM analysers

The K522 thermal conductivity analyser and Z530 zirconia oxygen analyser are 'blind' transmitter and sensor configurations designed for customers seeking to incorporate gas analysis and process control into their own instrumentation. Both analysers have 4-20mA and RS232 outputs as standard, they are supplied with software for calibration with ASCII protocol through the RS232 port.

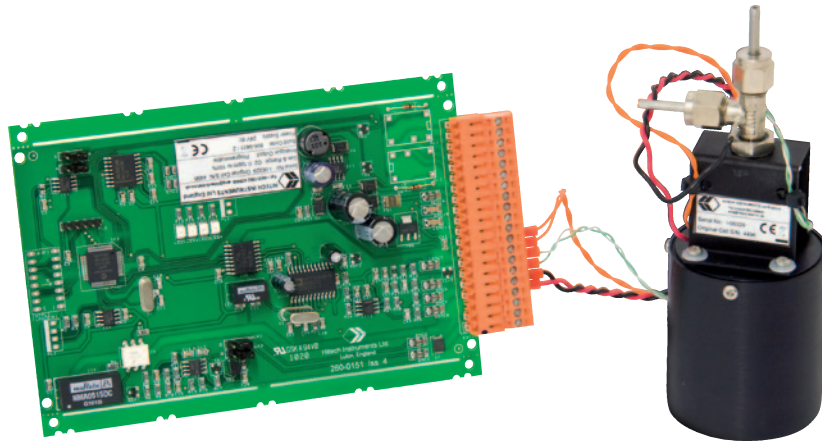
## APPLICATIONS

- OEM customers
- PLC systems
- Flow soldering
- Gas mixers

## MEASURED GASES INCLUDE

- Hydrogen (H<sub>2</sub>)
- Helium (He)
- Argon (Ar)
- Oxygen (O<sub>2</sub>)

The **K522** is a versatile katharometer programmed for a number of gases. Hydrogen and helium are particularly suited to this method and provide a proven, cost effective technique. All gases are supplied as 0-100% range and the output can be programmed according to the application. A gassing cap, EEx junction box and flameproof sensor head are all possible options. The pcb is supplied in a DIN rail mounting box for easy incorporation into customer's housings.



The **Z530** is the perfect solution for OEM customers requiring oxygen measurement. The Z530 is a 'blind' analyser comprising microprocessor based electronics mounted on a single pcb together with a separate zirconia oxygen sensor/heater assembly. Both parts are supplied loose to enable maximum flexibility for OEM customers. The Z530 features bi-directional RS232 allowing remote calibration and datalogging.



Cost effective solutions

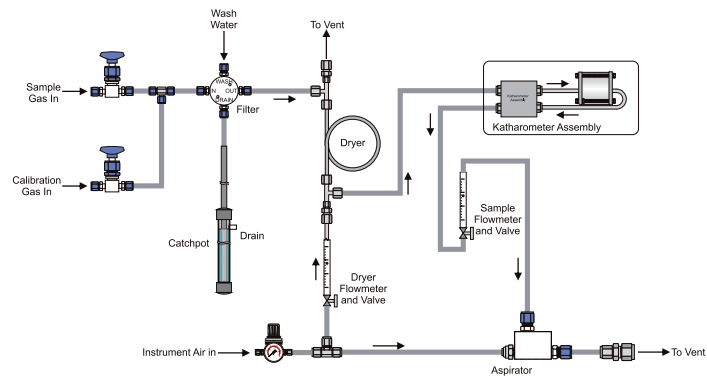
## Sample systems

Sensors for gas analysis are dependent on the condition of the sample that is supplied to them. Sample systems come in a variety of shapes and sizes, some are part of the internal build, some are loose issue accessories and some are built as complete external systems.

At Hitech we like to match each component to the application so many sample systems are designed on a bespoke basis. Below are some typical examples:

### Sample conditioning system suitable for 'wet' chlorine for use with the KK650

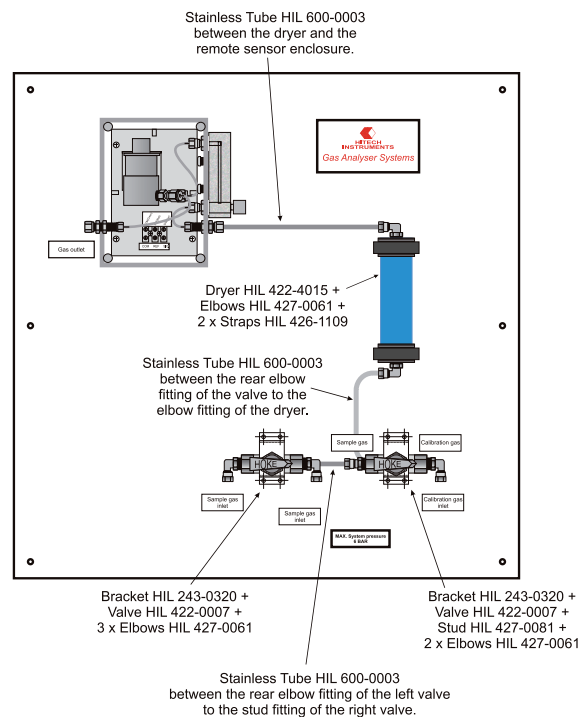
- Removes aerosol salt, removes water, removes water vapour
- Regulates flow
- Integral port for calibration/test gas
- Zero consumables
- Low maintenance
- All wetted parts compatible with chlorine gas



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### Sample system suitable for hydrogen monitoring in power station generators using the K1650

- Removes aerosol oil, removes water, removes water vapour
- Regulates pressure and flow
- Integral port for calibration/test gas
- Low maintenance
- Suitable for high pressure



# Scope of supply



Cooper Crouse-Hinds integrates a comprehensive line of electrical and instrumentation products with expert support, industry insights and local availability to improve safety and productivity in the most demanding industrial and commercial environments worldwide.

Customers will now be able to benefit from a single supplier for all of their hazardous area needs, whether this is for instrumentation products, fieldbus components, electrical switchgear or enclosure and wiring solutions.

MTL Instruments is recognised as a world leader in the development and supply of Intrinsic Safety, Process Control and Surge Protection products. Many of the world's safety-critical processes are monitored, controlled or protected by MTL Instruments products and the company is distinguished by its global network of sales and support centres and by its acknowledged position as a thought leader in this high technology marketplace.

More information on our product range is available in separate, comprehensive catalogues or datasheets available from your local MTL Instruments office, Hitech Instruments office or via our website.

'Many of the world's safety-critical processes are monitored, controlled or protected by **MTL Instruments** products'



HART

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FIELDBUS NETWORKS



NETWORK SECURITY



INTRINSICALLY SAFE ETHERNET



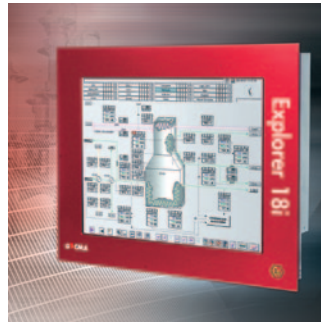
WIRELESS CONNECTIVITY



INTRINSIC SAFETY SOLUTIONS



PROCESS ALARM EQUIPMENT



VISUALISATION & INDICATORS



REMOTE I/O



SURGE PROTECTION



GAS ANALYSER SYSTEMS



INDUSTRIAL ETHERNET



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