

# Process Analyzers Product Guide

Make process decisions with confidence  
using accurate and reliable analyzers



# Ensuring the integrity of your process liquids and gases

Panametrics, a Baker Hughes business, offers a wide array of process analyzers that enable you to make process decisions with confidence. Reliable and stable, our products and services are backed by decades of industry experience and by knowledgeable experts to help you understand your application.

We know that when it comes to process control, accuracy and reliability are two of the greatest factors when choosing a process analyzer. Because we serve such a wide variety of industries, applications, technologies, and use cases, we've developed one of the strongest portfolios of process analyzers on the market.

# Industry applications


Panametrics' process measurement solutions cover a wide range of industries and applications.

## Key to industries


 Power Plant

 Refinery / Petrochemical Plant


 Natural Gas


 Steel Plant










 Industrial Gases

 Pharmaceutical

 Food and Beverages

 Quality, Test and Calibration

 Hydrogen

	Product Technology									
Moisture Analysis	moisture.IQ Aluminum Oxide	✓	✓	✓	✓	✓		✓		✓
	dew.IQ Aluminum Oxide	✓	✓		✓	✓	✓	✓		✓
	HygroPro Aluminum Oxide	✓	✓	✓	✓	✓		✓		✓
	MMY30 Aluminum Oxide	✓	✓	✓	✓	✓	✓	✓		✓
	MMY31 Aluminum Oxide						✓			
	PM880 Aluminum Oxide	✓	✓	✓	✓	✓	✓	✓		✓
	Aurora Laser		✓	✓	✓	✓				
	Optica Chilled Mirror				✓	✓	✓	✓	✓	
	OptiSonde Chilled Mirror				✓	✓	✓	✓	✓	
	MMR30 Polymer Capacitance	✓					✓	✓	✓	
	MMR31 Polymer Capacitance						✓	✓	✓	
	MMR101 Polymer Capacitance				✓		✓	✓	✓	
Gas Analysis	XMO2 Thermoparamagnetic		✓	✓	✓	✓	✓	✓	✓	
	oxy.IQ Electrochemical	✓	✓	✓	✓	✓	✓	✓		✓
	Delta F Non-depleting / Electrochemical		✓		✓	✓	✓			
	CGA351 Zirconia		✓			✓	✓			
	XMTC Thermal Conductivity	✓	✓	✓	✓	✓		✓		✓

# Moisture, Oxygen & Gas Analysis

**Moisture is considered a contaminant in many processes, causing corrosion in metal infrastructure, reduced process yield and impacting final product quality.**

As such, industrial processes may contain a moisture removal step using dryers like molecular sieves or glycol contactors to ensure moisture in process gases and liquids stay below permissible levels. Moisture measurement and control is therefore a critical component for a whole range of industries like natural gas, petrochemical processing, power generation, semiconductor manufacture and industrial gas, among others.

**Oxygen and gases such as hydrogen need to be measured and controlled in many processes and applications, from explosion prevention to ensuring process chemical reactions take place in a controlled manner.**

Applications for oxygen measurement range from tank inerting in the chemical industry to purity measurements in food packaging. Hydrogen measurement applications include power plant generators and electrolyzers for hydrogen production.

**The technologies used must be robust, reliable and proven in the field. Panametrics has a long tradition and experience in moisture, oxygen and gas analysis using various core technologies such as: aluminum oxide, laser, thermoparamagnetic, electrochemical, and thermal conductivity.**



# Moisture Analysis

## Aluminum Oxide Technology

Panametrics aluminum oxide moisture sensors have set the standard in process moisture measurement for more than 60 years. The sensor consists of a porous oxide layer with a very thin metal coating. Water vapor rapidly equilibrates on the pore walls of the oxide layer. The number of water molecules adsorbed on the oxide structure determines the conductivity of the pore walls, which in turn is functionally related to the water vapor pressure expressed as water dew point, PPMv, PPMw, etc.

### Benefits:

- The sensor reports pressure dew point at pressures up to 5000 psig (345 bar)
- Sensors work in liquid- and vapor-phase applications
- The sensor is calibrated in nitrogen for all applications
- Large dynamic measurement range: -110 °C to +60 °C dew/frost point
- Sensors are easy to replace in the field



### FEATURES

- Intrinsically safe
- Optional built-in temperature and pressure sensors
- Nonvolatile calibration data storage
- Calibrations traceable to national standards



### FEATURES

- Intrinsically safe
- Optional built-in temperature sensor
- Calibrations traceable to national standards

## moisture.IQ

### Multi-channel moisture analyser for measurement in gases and liquids

The flagship analyser of the IQ series is designed for installation in a control room or field setting, providing complete functionality where single or multiple measurements are required, for both moisture and oxygen analysis.

### APPLICATIONS

- Power Plant**
  - H<sub>2</sub> (cooling generator)
  - Instrument Air lines
  - SF<sub>6</sub> gas
  - Transformer oil
- Refinery / Petrochemical**
  - Hydrocarbon Liquids
  - Hydrogen recycle gas
  - Utility gas/Instrument air
  - Ethylene
  - Polyethylene plant feeds
- Natural Gas**
  - Natural gas pipelines
  - LNG, LPGs, NGLs
  - Biogas upgrading
- Steel Plant**
  - Annealing Lines
  - Galvanisation Lines
  - Utilities
- Industrial Gases**
  - Air Separation Units
  - Cylinder filling
- Food & beverages**
  - CO<sub>2</sub> gas
- Hydrogen**
  - Steam Methane Reformers
  - Electrolyzers
  - Pipeline & Storage



### FEATURES


- 1 to 6 channels of moisture and oxygen measurement
- Touch screen display
- Analog and digital outputs
- Compatible with MISP2 and M series aluminum oxide moisture probes
- 19" rack, panel, weatherproof wall-mount and explosionproof versions available

# dew.IQ


## Single-channel moisture analyser for measurement in gases

An economical, single-channel, aluminium oxide hygrometer in the IQ Series line of analysers. It is intended for industrial applications requiring accurate, real-time moisture measurement.


### APPLICATIONS

-  **Power Plant**  
H<sub>2</sub> (cooling generator)  
Instrument Air lines  
SF<sub>6</sub> gas


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-  **Refinery / Petrochemical**  
Utility gas / Instrument air


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-  **Steel Plant**  
Annealing Lines  
Galvanisation Lines  
Utilities


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-  **Industrial Gases**  
Air Separation Units  
Cylinder filling


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-  **Pharmaceutical**  
Utility air  
Instrument calibration

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-  **Food & beverages**  
CO<sub>2</sub> gas

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-  **Hydrogen**  
Steam Methane Reformers  
Electrolyzers  
Pipeline & Storage



### FEATURES


- Rack, bench, panel and wallmount versions available
- Displays moisture content in dew / frost point and ppmv
- M Series or IQ.probe moisture probe compatible
- Intrinsic safe operation of M Series probe with external zener barrier

# HygroPro


## Intrinsically safe moisture transmitter for use in gas and liquid applications

The intrinsically-safe HygroPro moisture transmitter measures the moisture content of gases and non-aqueous liquids in pipelines, natural gas, petrochemical, power generation, pharmaceutical, process and industrial applications.


### APPLICATIONS

-  **Power Plant**  
H<sub>2</sub> (cooling generator)  
Instrument Air lines  
SF<sub>6</sub> gas  
Transformer oil


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-  **Refinery / Petrochemical**  
Hydrocarbon Liquids  
Hydrogen recycle gas  
Utility gas/Instrument air  
Ethylene  
Polyethylene plant feeds


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-  **Natural Gas**  
Natural gas pipelines  
LNG, LPGs, NGLs  
Biogas upgrading


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-  **Steel Plant**  
Annealing Lines  
Galvanisation Lines  
Utilities


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-  **Industrial Gases**  
Air Separation Units  
Cylinder filling

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-  **Food & beverages**  
CO<sub>2</sub> gas

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-  **Hydrogen**  
Steam Methane Reformers  
Electrolyzers  
Pipeline & Storage



### FEATURES

- Intrinsically safe
- Ambient to ppb moisture levels using aluminium oxide moisture sensor
- Built-in temperature and pressure sensors
- Gas and liquid applications




# DewPro MMY30


## Loop powered moisture transmitter for measurement in gases

The MMY30 is designed to measure dew point or ppm in gases at line or atmospheric pressure. An integral flow cell with filtration and flow regulation allows for easy implementation.


### APPLICATIONS

-  **Power Plant**  
H<sub>2</sub> (cooling generator)  
Instrument Air lines  
SF<sub>6</sub> gas


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-  **Refinery / Petrochemical**  
Utility gas / Instrument air


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-  **Natural Gas**  
Natural gas pipelines  
LNG, LPGs, NGLs  
Biogas upgrading


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-  **Steel Plant**  
Annealing Lines  
Galvanisation Lines  
Utilities


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-  **Industrial Gases**  
Air Separation Units  
Cylinder filling


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-  **Pharmaceutical**  
Utility air  
Instrument calibration

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-  **Food & beverages**  
CO<sub>2</sub> gas

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-  **Hydrogen**  
Steam Methane Reformers  
Electrolyzers  
Pipeline & Storage



### FEATURES

- Loop powered, 4-20mA transmitter
- Integral filtering and flow regulation
- Hazardous area configurations available




# DewPro MMY31

## Loop powered moisture transmitter for measurement in gases

The MMY31 is designed for inline installation in clean applications where trace moisture measurement is required and a bypass or extractive installation is not appropriate.

### APPLICATIONS

-  **Pharmaceutical**  
Utility air  
Instrument calibration  
Environmental chambers  
Glove boxes



### FEATURES

- Loop powered, 4-20mA transmitter
- Hazardous area configurations available



# PM880

## Rugged intrinsically safe portable moisture meter for gases and liquids

The PM880 is the number one hazardous area rated portable moisture meter on the market. It is designed to measure moisture in gases and hydrocarbon liquids across a broad spectrum of applications and industry segments. The compact and rugged design makes it suitable for use in the toughest of environments.

### APPLICATIONS

- Power Plant**
  - H<sub>2</sub> (cooling generator)
  - Instrument Air lines
  - SF<sub>6</sub> gas
  - Transformer oil
- Refinery / Petrochemical**
  - Hydrocarbon Liquids
  - Hydrogen recycle gas
  - Utility gas / Instrument air
  - Ethylene
  - Polyethylene plant feeds
- Natural Gas**
  - Natural gas pipelines
  - LNG, LPGs, NGLs
  - Biogas upgrading
- Steel Plant**
  - Annealing Lines
  - Galvanisation Lines
  - Utilities
- Industrial Gases**
  - Air Separation Units
  - Cylinder filling
- Pharmaceutical**
  - Utility air
- Food & beverages**
  - CO<sub>2</sub> gas
- Hydrogen**
  - Steam Methane Reformers
  - Electrolyzers
  - Pipeline & Storage



### FEATURES

- Intrinsically safe in a rugged compact package
- Measures moisture in gases and hydrocarbon liquids
- Internal data logger
- Lightweight handheld sample system
- Large graphic display
- Compatible with MISP2 and M series aluminum oxide moisture probes





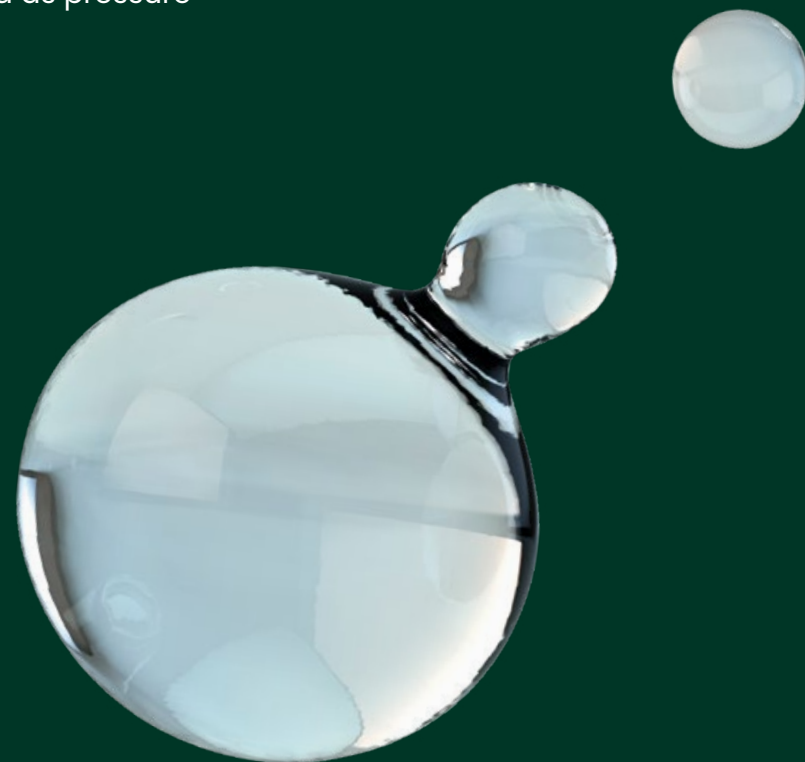
# Moisture Analysis

## Laser Technology

Panametrics Aurora analyzer uses tunable diode laser absorption spectroscopy (TDLAS) to rapidly and accurately measure moisture in a variety of background gases. The concentration of water is directly related to the partial pressure. At certain specific frequencies, light energy will be absorbed by water molecules. As the concentration of water increases, the absorption also increases. Aurora analyzers sweep the diode laser output through a narrow spectrum of light frequencies. Comparing the return light intensity with the incident light intensity, the analyzer provides a direct measure of the water vapor pressure in PPMv and related units. With the input of line pressure, the moisture content is expressed as pressure dew point.

### Benefits:

- Very fast response, especially after process upset
- Long-term stability, negligible drift
- Non-contact based measurement, suitable for harsh applications



## Aurora

### Laser based moisture analyzer for gases

The Aurora uses tunable diode laser absorption spectroscopy (TDLAS) to quickly and accurately measure moisture in gases, with speed of light response and minimum maintenance requirements.

#### APPLICATIONS



**Refinery / Petrochemical**  
Hydrogen recycle gas  
Utility gas / Instrument air



**Natural Gas**  
Natural gas dehydration  
Natural gas pipelines and storage  
LPGs, NGLs  
Biogas upgrading



**Steel Plant**  
Annealing Lines  
Galvanisation Lines  
Utilities



**Industrial Gases**  
Air Separation Units  
Cylinder filling  
CO<sub>2</sub>



#### FEATURES

- Rated for installation directly in a hazardous area
- Optical response <2 seconds
- Integrated sample system for measurement integrity
- Patented temperature and pressure compensation
- Optional safe area 19" rack mount and portable configurations available



# Moisture Analysis

## Chilled Mirror Technology

Panametrics chilled mirror sensors use a thermoelectric cooling module to cool the mirror exposed to the flowing gas sample. Infrared light reflects off the mirror. The reflected light is received by a photodetector. As the mirror is cooled, and water vapor condenses on the mirror, the light received by the photodetector decreases due to absorption and scattering. The signal from the photodetector is utilized in a control loop to maintain a constant mass. A precision RTD measures the temperature of the mirror. This mirror temperature is by definition equal to the dew or frost point temperature..

### Benefits:

- Direct fundamental measurement of dew / frost point
- High precision
- Long-term stability



## Optica

### Chilled mirror based hygrometer for high accuracy moisture measurements in gases

The Optica is a primary standard measurement device designed for industrial and laboratory applications requiring high precision without long term drift. It may be used with a number of chilled mirror sensors providing a wide measurement range.

### APPLICATIONS



#### Steel Plant

Annealing Lines  
Galvanisation Lines  
Utilities



#### Industrial Gases

Air Separation Units  
Cylinder filling



#### Pharmaceutical

Utility air  
Instrument calibration  
Clean Room



#### Food & beverages

Utility air  
Instrument calibration  
Clean Room



#### Quality, Test & Calibration

Environmental test chambers  
Engine test cells  
Air conditioning and heat exchange coil testing  
Metrology labs



### FEATURES

- Measurements traceable to national standards
- 1/4 color VGA display
- Built-in data logger
- Multiple measurement units can be displayed and transmitted
- Patented PACER® cycle automatically cleans mirror to ensure measurement integrity



# OptiSonde

## Economical chilled mirror based hygrometer for high accuracy moisture measurements in gases

The OptiSonde is a primary standard device designed for process and laboratory measurements requiring high precision without long term drift. It may be used with a number of chilled mirror sensors providing a wide measurement range.

### APPLICATIONS



#### Steel Plant

Annealing Lines  
Galvanisation Lines  
Utilities



#### Industrial Gases

Air Separation Units  
Cylinder filling



#### Pharmaceutical

Utility air  
Instrument calibration  
Clean Room



#### Food & beverages

Utility air  
Instrument calibration  
Clean Room



#### Quality, Test & Calibration

Environmental test chambers  
Engine test cells  
Air conditioning and heat exchange coil testing  
Metrology labs



### FEATURES

- Measurements traceable to national standards
- Built-in data logger
- Multiple measurement units can be displayed and transmitted
- Patented PACER® cycle automatically cleans mirror to ensure measurement integrity



# Moisture Analysis

## Polymer Capacitance Technology

Panametrics relative humidity transmitters use a proven polymer capacitive sensor to provide a humidity measurement in the range of 0 to 100% RH. The sensor consists of a hygroscopic polymer sensing layer whose dielectric properties change depending on the amount of water vapor in contact with the sensing surface. This causes a change in the capacitance of the sensor which is then converted into a relative humidity reading.

### Benefits:

- Good resistance to chemical vapors
- Ability to function at high temperatures (>100 °C)
- Fast speed of response
- Ability to recover from condensation or full water immersion







## MMR30

### Loop powered mid-range moisture transmitter

The MMR30 is designed for mid-range (5°F to 185°F/-15°C to 85°C) moisture applications such as refrigerated compressed air dryers. It is compact and can be easily installed in indoor or outdoor environments.

### APPLICATIONS

-  **Power Plant**  
Gas Turbine inlet air
-  **Pharmaceutical**  
Drying applications  
Product Validation  
Tablet coating  
ETO Sterilisation
-  **Food & beverages**  
Dehydration applications  
Fruit Ripening  
Coating
-  **Quality, Test & Calibration**  
Weather Stations



### FEATURES

- Loop powered 4-20mA transmitter
- Proven Polymer Capacitive sensor
- Integral filtering and flow regulation
- Optional integral display with user interface



## MMR31

### Loop powered mid-range moisture transmitter

The MMR31 is designed for relative humidity measurement (0-100%) applications. It is compact and can be easily installed in indoor or outdoor environments.

#### APPLICATIONS



**Pharmaceutical**  
Drying applications  
Product Validation  
Tablet coating  
ETO Sterilisation



**Food & beverages**  
Dehydration applications  
Fruit Ripening  
Coating



**Quality, Test & Calibration**  
Humidity control  
sterilization chambers



#### FEATURES

- Loop powered 4-20mA transmitter
- Proven Polymer Capacitive sensor
- Simple field recalibration with salt bottles
- Optional integral display with user interface
- Hazardous area options available

## MMR101

### Loop powered high temperature relative humidity transmitter

The MMR101 is designed for high temperature relative humidity (0-100%) applications. It's rugged design is suitable for the harshest installations.

#### APPLICATIONS



**Steel Plant**  
Blast gas humidification



**Pharmaceutical**  
High temperature  
drying applications



**Food & beverages**  
High temperature  
drying applications

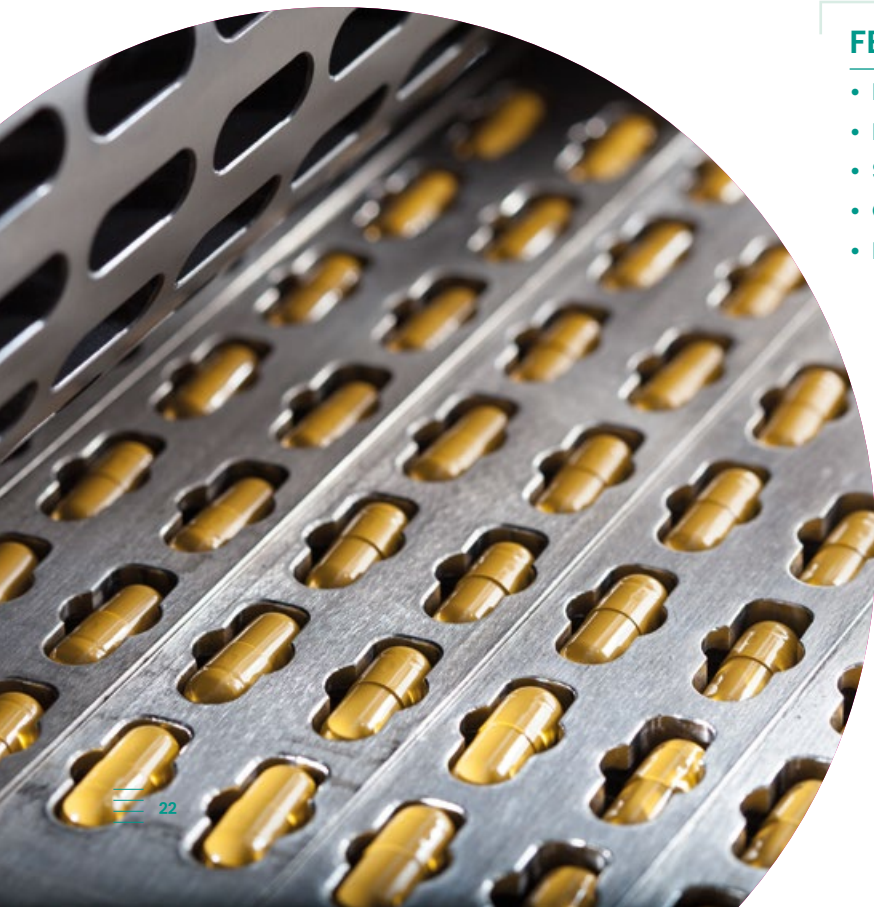


**Quality, Test & Calibration**  
High temperature  
drying applications



#### FEATURES

- Loop powered 4-20mA transmitter
- Proven Polymer Capacitive sensor
- Optional integral display with user interface
- Hazardous area options available
- Operating temperature up to 300°F (150°C)



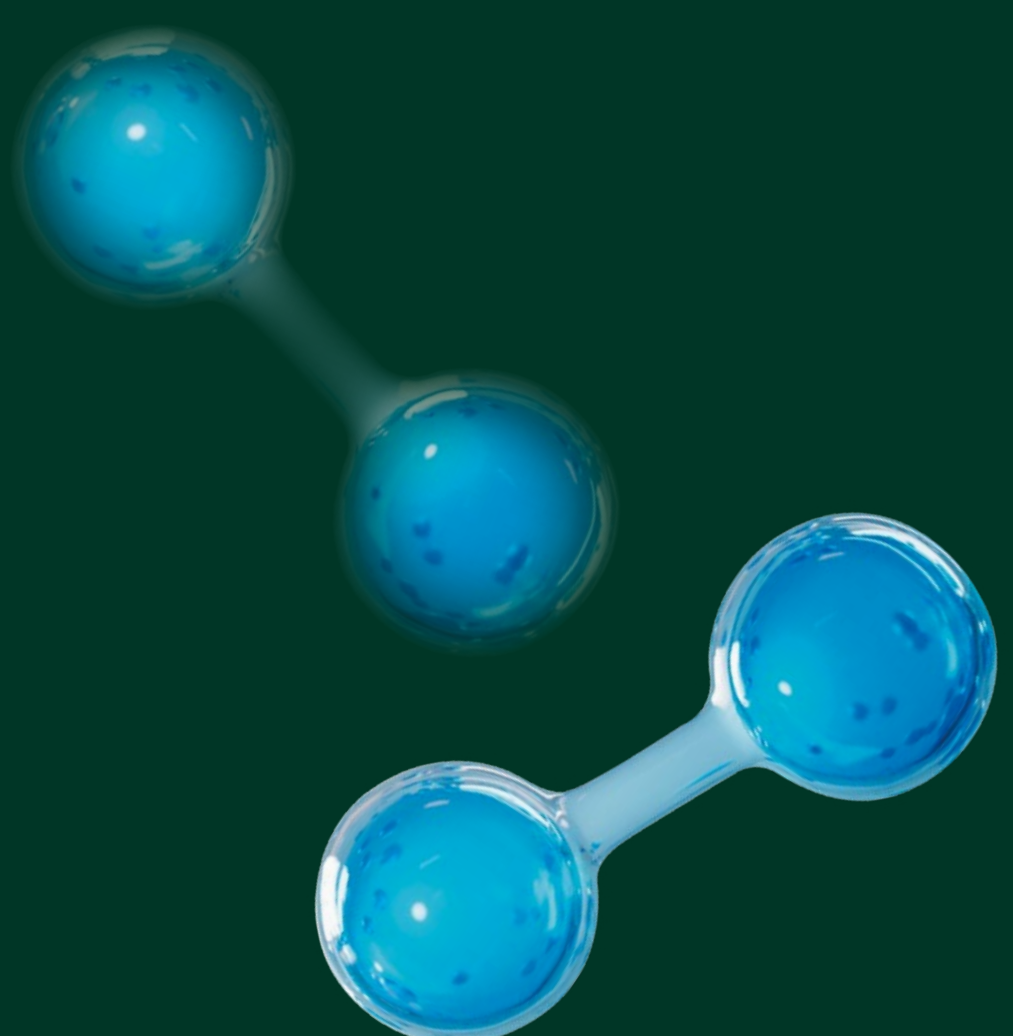
# Oxygen Analysis

## Thermoparamagnetic Technology

Oxygen has the property of being attracted into a magnetic field. The Panametrics XMO2 thermoparamagnetic analyzer uses this paramagnetic property combined with heated thermistors to measure the oxygen concentration. This measurement technique along with the flow-through design and no moving parts ensure a stable measurement, long-term calibration stability, and immunity to process upsets.

### Benefits:

- No Moving Parts
- Infrequent Calibration
- Simple, Easy to use
- Automatic Calibration / Verification
- Minimized Cost of Ownership
- Compact design reduces cost in system solutions



## XMO2

### Proven robustness in hazardous area oxygen analysis in gas applications

Designed for stability and longevity in hazardous area locations, the XMO2 provides high accuracy percent-level measurements and easily recovers from process upsets.

### APPLICATIONS

**Refinery / Petrochemical**  
 Inerting of Storage Tanks  
 Hydrocarbon Gas Supply  
 Hydrogen Recycle Gas  
 Ethylene/Polyethylene Plant

**Natural Gas**  
 Biogas Processing

**Steel Plant**  
 Heat treatment Processes

**Industrial Gases**  
 Percent Oxygen Analysis

**Pharmaceutical**  
 Storage Tanks for Liquid Hydrocarbons  
 Centrifuges and Reactors  
 Ambient Atmosphere Monitoring  
 Carbon Reactivation  
 Reaction Optimization

**Food & beverages**  
 Inert Gas Packing  
 Prevention of Oxidation of Dry Powders

**Quality, Test & Calibration**  
 Waste Water Treatment



### FEATURES

- Background gas compensation
- Push button field calibration
- No moving parts assuring trouble-free operation
- Class 1 Div 1 / ATEX and IECEx zone 1 as standard



# Oxygen Analysis

## Electrochemical Technology

Panametrics' oxy.IQ utilizes galvanic fuel cell technology to measure trace and percent-level oxygen in gases. Oxygen in the gas flowing through the chamber reacts at the cathode to form ions that travel to the anode, converting from lead to lead oxide. The resultant current is proportional to the amount of oxygen. The oxy.IQ uses an advanced galvanic fuel cell, a self-contained cell that requires no electrolyte refueling or electrode replacement, providing superior performance, accuracy, stability and long life. The oxy.IQ is insensitive to background gas changes with drop-in sensors that cover different concentration ranges, with a special sensor option for acid gas compositions.

### Benefits:

- Compact design allows installation flexibility
- Proven galvanic fuel cell technology
- Background gas insensitivity
- Acid gas sensor options



## oxy.IQ

Highly reliable and cost effective oxygen measurement, all in a compact intrinsically safe package

Designed for installation flexibility, the oxy.IQ is a two wire loop powered transmitter with 17 percent- and ppm-level oxygen ranges. oxy.IQ combines proven sensor technology, an intuitive user interface, and a compact design in an intrinsically safe package perfect for oxygen measurement in a variety of background gases.

### APPLICATIONS

- Power Plant**  
Oxygen measurement H<sub>2</sub> cooled generators
- Refinery / Petrochemical**  
Catalytic reformer for recycle hydrogen  
Isomerization unit for recycle hydrogen  
Butamer unit off-gas  
Hydrotreater for recycle hydrogen  
Fuel gas / off gas
- Natural Gas**  
Natural gas pipelines  
Biogas processing
- Steel Plant**  
Heat treatment Processes
- Industrial Gases**  
Nitrogen Generators  
Oxygen Applications
- Pharmaceutical**  
Glove Box Applications
- Food & beverages**  
Inert Gas Packing  
CO<sub>2</sub> Purity (Breweries)
- Hydrogen**  
Water Electrolysis: traces of oxygen in hydrogen



### FEATURES

- Compact and innovative design, easy installation and system solution flexibility
- Built-in microprocessor, intuitive user interface to easily select range, trim outputs and perform calibration
- User-selectable ranges, calibration, sensor diagnostics with keypad simplifies programming
- Maintenance-free device

# Oxygen Analysis

## Non-depleting Electrochemical

Panametrics delivers Delta F oxygen sensor technology as a standard sensor input to the Panametrics flagship moisture.IQ analyzer. The oxygen from the sample takes part in a reaction. The voltage applied to the electrodes is the driving force. At the cathode, the oxygen is first converted into hydroxyl ions. These hydroxyl ions travel through the electrolyte to the anode where it is converted back to oxygen. The current is a direct measurement of the hydroxyl ion transport and therefore proportional to the oxygen concentration. Nothing is consumed in making the measurement.

### Benefits:





- Non-depleting oxygen sensor
- Sensitivity down to a ppb-level oxygen
- Fast response to changes in oxygen concentration
- Short recovery time after exposure to high concentrations
- Ability to work in acid gases using Stab-El electrodes

## Delta F

### Delivering ultra-stable, trace oxygen analysis in industrial gas applications

The Delta F non-depleting, coulometric oxygen sensor provides ultra-stable oxygen measurement and requires only an annual span calibration. Combined with Panametrics' moisture.IQ, this offers a cost effective six-channel solution for multi-point oxygen measurement covering ppm and ppb measurements. The Delta F sensor is particularly suited to applications requiring high sensitivity measurements for process control.

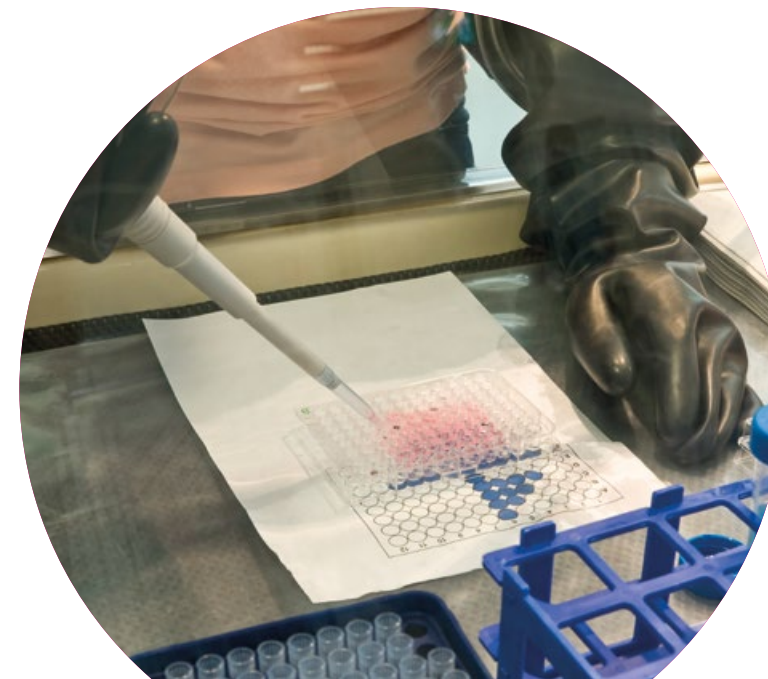
### APPLICATIONS

-  **Refinery / Petrochemical**  
Ethylene  
Polyethylene plant feeds
-  **Steel Plant**  
Heat treatment Processes
-  **Industrial Gases**  
Air separation units (N<sub>2</sub> / Ar / O<sub>2</sub> / H<sub>2</sub>)  
Cylinder filling
-  **Pharmaceutical**  
Glove Box Applications



### FEATURES

- Ultra-stable coulometric measurement technology
- Non-depleting sensor
- Fast response times
- Unique combination with moisture.IQ offers up to 6-channels of moisture and oxygen
- Safe and hazardous area configurations





# Oxygen Analysis

## Zirconia Technology

The CGA351 is a Clean Gas Analyzer that uses zirconium oxide technology to measure trace oxygen in clean, inert gases such as high-purity nitrogen. The tube-shaped sensor consists of yttrium-substituted zirconium oxide. The platinum coating acts as an electrode. At the elevated operating temperature of the sensor, oxygen reacts with the platinum to form ions that travel from the ambient air reference on the outer side of the sensor tube, through the walls of the sensor, towards the sample gas on the inner side of the sensor tube. The generated milli-volt signal correlates with the oxygen concentration in the sample gas. The lower the oxygen concentration, the more ions that travel through the matrix, and the higher the mV signal.

### Benefits:

- Technology with quick response time and outstanding performance
- Measuring range from 0.1 ppm to 100% oxygen
- Quick single gas calibration
- Long sensor lifetime
- Maintenance-free



## CGA351

### Super fast response times covering all oxygen ranges in clean gas applications

This fastest responding oxygen measurement technology is ultra-stable and covers low-ppm to percent-level measurements. Single-point calibration compliments a low maintenance analyzer particularly suited for clean gas applications where speed of response and accuracy are key requirements.

### APPLICATIONS

- Refinery / Petrochemical**  
N<sub>2</sub> Plant Utilities
- Industrial Gases**  
Air separation units (N<sub>2</sub> / Ar / O<sub>2</sub> / H<sub>2</sub>)  
Cylinder Filling
- Pharmaceutical**  
Glove Box Applications



### FEATURES

- **Fastest Responding Oxygen Sensor:** T90 at under 2 seconds
- **Covers a wide Oxygen Concentration Range** from 0.1 ppm to 100% oxygen
- **High accuracy** at lower ppm levels
- **Maintenance free**

# Gas Analysis

## Thermal Conductivity Technology

Thermal conductivity is a physical property, a fluid's ability to dissipate heat. This property is useful in measuring concentrations in binary gas mixtures such as oxygen in hydrogen, carbon dioxide in methane, etc. Panametrics' XMTC compares the thermal conductivity of the sample gas to that of a reference gas to determine the percent-level concentration of one gas in a two-gas mixture or multi-gas mixture of gases with similar thermal conductivities. The sample gas flows through the measuring cell with built-in thermistors. The thermal conductivity difference between the sample and reference, when compared to the zero and span gas calibration, is directly proportional to the gas concentration. The XMTC can reliably measure percent-levels of one gas in another, when the two gases have sufficiently different thermal conductivities.

### Benefits:



- Compact, rugged, no moving parts
- Enhanced signal measurement
- Real-time error detection
- Digital communication
- Flexible calibration, various gas combinations
- Minimal calibration and service

## XMTC

### High accuracy analysis in a compact binary gas analyzer

The XMTC is a compact, reliable, and field-proven thermal conductivity analyzer for safety and measurement applications. Certified for hazardous area environments, the XMTC is a cost effective analyzer in a compact transmitter design for percent measurement of one gas in another.

### APPLICATIONS

-  **Power Plant**  
Hydrogen-Cooled Generators
-  **Refinery / Petrochemical**  
Catalytic Reformer for Recycle Hydrogen  
Isomerization Unit for Recycle Hydrogen  
Butamer Unit Off-Gas  
Hydrotreater for Recycle Hydrogen  
Fuel Gas/Exhaust Gas
-  **Natural Gas**  
Biogas processing
-  **Steel Plant**  
Heat treatment Processes
-  **Industrial Gases**  
Air separation units (N<sub>2</sub> / Ar / O<sub>2</sub> / H<sub>2</sub>)  
Cylinder filling
-  **Food & beverages**  
CO<sub>2</sub>-purity (Breweries)
-  **Hydrogen**  
Water Electrolysis: Hydrogen and  
Oxygen Analysis



### FEATURES

- One-button field calibration
- Ultra stable thermistors
- Temperature compensation for reduced temperature effect
- Compact sensor Assembly
- Class 1 Div 1, ATEX and IECEx Zone 1, IP66/4X

# Multi-function Displays

Panametrics offers a suite of local displays / controllers that connect to the blind oxygen and binary gas transmitters providing power and local read-out. Additional features include alarm contacts, additional analog outputs, and auto-calibration functionality.

## Benefits:

- Sensor installed at point of use
- Display installed where needed for visual indication
- Auto-calibration / verification capabilities
- Provides DC power to the transmitters when AC power is available



## XDP

Offering added functionality to Panametrics transmitters, the XDP is more than just a fully certified explosionproof display

In addition to offering a local display, the auto-calibration and verification functionality of the XDP complements the XMO2 and XMTC transmitters with even lower maintenance and calibration requirements, offering a full solution package. The advanced micro-processor control compares calibration readings with factory settings to verify calibration. Corrections are automatic with user notification.

### COMPATIBLE WITH

#### XMO2



#### XMTC



#### oxy.IQ



### FEATURES

- Full solution enabler to compliment the XMO2, XMTC and oxy.IQ with added functionality
- 4 relay output for solenoid control
- Very low maintenance requirement and reduced touch time of other transmitters
- Class 1 Div 1 / ATEX and IECEx zone 1 as standard
- Calibration Curve Management

## TMO2D

**Added functionality in a cost effective package, this safe area display compliments the Panametrics analyzers with increased functionality and control**

The TMO2D offers auto-calibration and verification control to support the XMO2, XMTC and oxy.IQ analyzers. This package comes in user selectable form factors which offers reduced maintenance and alarm outputs.



### COMPATIBLE WITH

#### XMO2



#### XMTC



#### oxy.IQ



### FEATURES

- Single or dual isolated 4-20mA outputs
- Up to four field-configurable process alarms
- Automatic calibration relays for autocalibration of XMO2 and XMTC
- Calibration Curve Management



# Sample Conditioning Systems

## Save money and time with the right sample system from the application experts

Sample handling systems are essential for getting top performance from your process analyzer systems. To get the right sample system for your application, turn to Panametrics, the analyzer application expert with more than 50 years of design experience. Couple Panametrics process analyzers with the appropriate Panametrics sample handling and you will have reliable, accurate, and low maintenance measurements.

### Features and benefits:

Panametrics sample systems ensure the performance of an analyzer by supplying a sample to the analyzer at optimal pressure, temperature, flow rate, and free from contaminants. Designed specifically to meet the needs of your Panametrics analyzers, Panametrics sample systems reduce cost and downtime by:

- Providing better measurement accuracy and reliability
- Extending analyzer life
- Minimizing analyzer maintenance and associated parts and labor
- Facilitating field calibration



## Application engineering is the difference

Our application and service engineering teams possess the expertise to provide a comprehensive sample system designed and built for your specific situation. We know how our analyzers perform in your applications and how our sample handling systems can help deliver the best measurements. We offer a cost-effective source for complete analyzer packages.

- Standard systems for common applications
- Engineered systems for customer-specific requirements
- Design, construction, and inspection of all systems
- Installation guidance
- Start-up and commissioning
- Calibration
- Extended warranties and service plans for analyzer systems





a Baker Hughes business

Panametrics, a Baker Hughes business, provides solutions in the toughest applications and environments for moisture, oxygen, liquid and gas flow measurement. Experts in flare management, Panametrics technology also reduces flare emissions and optimizes performance.

With a reach that extends across the globe, Panametrics' critical measurement solutions and flare emissions management are enabling customers to drive efficiency and achieve carbon reduction targets across critical industries including: Oil & Gas; Energy; Healthcare; Water and Wastewater; Chemical Processing; Food & Beverage and many others.

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