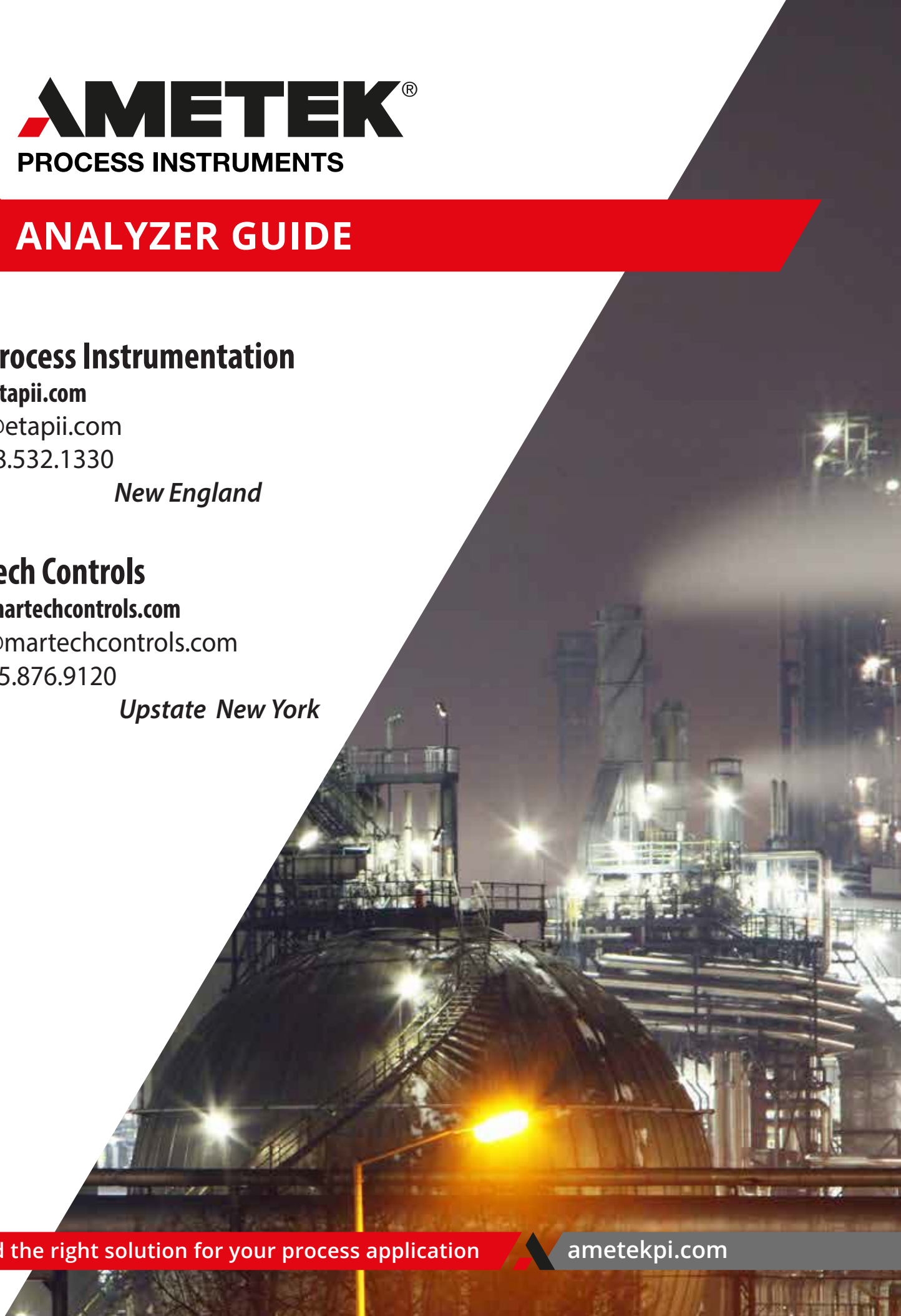
AMETEK®
PROCESS INSTRUMENTS

ANALYZER GUIDE



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Find the right solution for your process application

ametekpi.com

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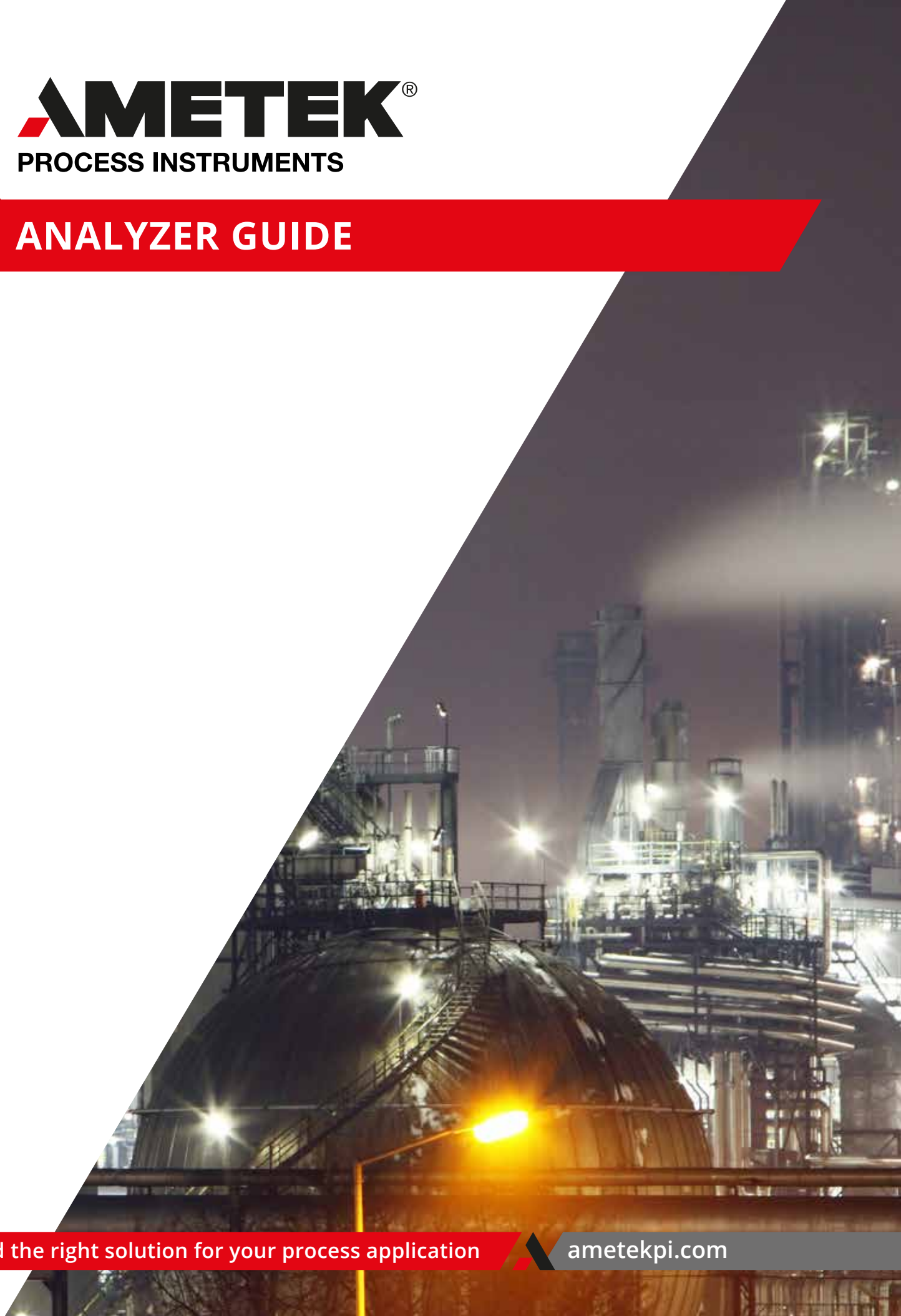


Find the right solution for your process application

ametekpi.com

AMETEK®
PROCESS INSTRUMENTS

ABOUT US

AMETEK Process Instruments is a worldwide manufacturer of process analyzers and instrumentation.

At AMETEK Process Instruments, we focus our experience on designing innovative analyzers that help our customers reach higher levels of productivity and quality. We achieve this by finding ways to overcome the limitations of current methods of process monitoring, control and quality assurance. Through this focus we have created some of the most capable technologies in the world.

Our primary focus in analyzer design is reliability. We understand that you must have confidence that the analyzer will provide the correct information when you need it. It is a documented fact that many of our analyzers have been in service for well over 20 years.

Markets Served:

Core Competencies

- Burner air/fuel mixing control
- Chemical composition analysis of gases and liquids
- Coal fired power generation
- Combustion and furnace atmosphere control
- Combustion/process heating
- Contamination monitoring of high and ultra-high purity gases
- Heat treating atmosphere monitoring/control
- Natural gas processing and transmission
- Pharmaceutical solvent drying processes
- Emissions monitoring
- Quality monitoring of gas and liquid feedstocks
- Refining and petrochemical processes
- Sulfur recovery processes
- Trace analysis
- Vacuum analysis/residual gas analysis

Analyzer Technologies

- Gas chromatographs (GC)
- Gas gravitometers
- Katharometers
- Manual and online chilled-mirror dew point analyzers
- Mass spectrometers
- Optical luminescent oxygen
- Quartz crystal microbalance (QCM) and electrolytic moisture analyzers
- Residual gas analyzers
- Tunable diode laser absorption spectroscopy (TDLAS)
- Ultraviolet and visible (UV-VIS) and infrared (IR) process analyzers
- X-ray transmission (XRT)
- Zirconium oxide analyzers

Unique Solutions – Custom Designs

No single solution fits all applications or processes. If a pre-engineered product does not meet your needs, we will work with you to custom-design an analyzer suited to your specific application. We pride ourselves on our technical applications knowledge and willingness to produce unique analyzers and solutions for our customers.

Service Commitment

Our customer commitment continues well beyond start-up and commissioning. We offer a wide variety of service plans and resources to support our customers' installations anywhere in the world.

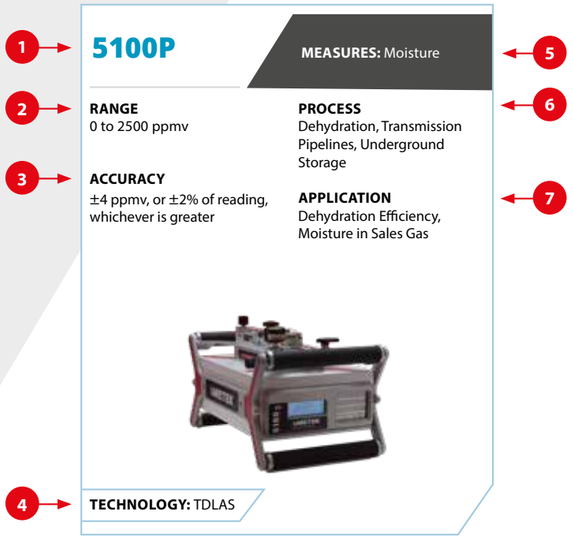
AMETEK®
PROCESS INSTRUMENTS

USER GUIDE

Find the right analyzer for your application. We've made it simple with our at-a-glance listings, separated into the key markets we supply.

GLOSSARY

ABBREVIATION	DESCRIPTION
AMU	Atomic mass unit
BTU	British thermal unit
CCR	Continuous catalyst regeneration
CEM	Continuous emission monitoring
GC-FID	Gas chromatography with flame ionization detector
GC-RGD	Gas chromatography with reduction gas detector
IR	Infrared
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MAU	Milli-absorbance unit
NDIR	Nondispersive infrared
NGL	Natural gas liquids
P_2O_5	Phosphorus pentoxide
ppb	Parts per billion
ppbv	Parts per billion by volume
ppm	Parts per million
ppmv	Parts per million by volume
ppmw	Parts per million by weight
QCM	Quartz crystal microbalance
QL	Quenched luminescent
TCD	Thermal conductivity detector
TDLAS	Tunable diode laser absorption spectroscopy
TGTU	Tail gas treating unit
TRS	Total reduced sulfur
UV	Ultraviolet
ZrO_2	Zirconium oxide



1. MODEL - Analyzer name

2. RANGE - Valid measurement concentrations

3. ACCURACY - Degree of measurement precision

4. TECHNOLOGY - Measurement technology used

5. MEASURES - Elements or compounds detected

6. PROCESS - Chemical operation/operating unit

7. APPLICATION - Particular function

CONTENTS

HYDROCARBON PROCESSING

Optimized process solutions

With decades of experience in this industry, AMETEK Process Instruments offers an extensive range of combustion, gas, and moisture analyzers for the hydrocarbon processing market.

Our unique technologies and advanced designs provide the critical measurements needed to optimize your process. This ensures a high-quality product produced in safe operating conditions.

888

MEASURES: H_2S, SO_2

RANGE
Standard: 0 to 1% SO_2;
0 to 2% H_2S
High Range: 0 to 2% SO_2;
0 to 4% H_2S

ACCURACY
±1% of full scale

PROCESS
Sulfur Recovery

APPLICATION
Tail Gas/Air Demand Ratio,
Sulfur Pit Safety Monitoring

TECHNOLOGY: UV

900

MEASURES: H_2S, SO_2, COS, CS_2

RANGE

Species measured	Minimum full scale	Maximum full scale
H_2S	250 ppm	100%
SO_2	250 ppm	100%
CS_2	5000 ppm	100%
COS	5000 ppm	100%

ACCURACY
SO_2 and H_2S: ±1% of full scale of standard ranges
COS and CS_2: ±10% of full scale of standard ranges

PROCESS
Sulfur Recovery

APPLICATION
Tail Gas/Air Demand Ratio

TECHNOLOGY: UV

IPS-4

MEASURES: NH_3, H_2O, CO_2, SO_2, H_2S, NO, NO_2, NOx, THC, ASTM color standards, Ethylene Glycol

RANGE
ppmv/ppmw to 100%, application dependent

ACCURACY
UV: ±1% of full scale range
IR: ±2% of full scale range
Dual Bench: ±2% of full scale typical

PROCESS
Sulfur Recovery, Emission Compliance, Ethylene Oxide, Sour Gas Treatment, SO_2 Recovery/H_2SO_4

APPLICATION
Feed Forward, Emissions, Ethylene Glycol QA/QC, Amine Efficiency, SO_2 Removal Efficiency

TECHNOLOGY: UV/NDIR

9900 RM/WM

MEASURES: H_2S, SO_2, NO, NO_2, ClO_2, NOx, NH_3, Optional O_2

RANGE

Species Measured	Single Species Minimum Full Scale	Multi-Species Minimum Full Scale
SO_2	10 ppm	20 ppm
H_2S	25 ppm	100 ppm
NO	50 ppm	50 ppm
NO_2	100 ppm	100 ppm
NOx	n/a	100 ppm
O_2	0%	25%

ACCURACY
Better than ±1.0% of standard full scale range
O_2: ±0.1%

PROCESS
Emissions Control

APPLICATION
Continuous Emission Monitoring System

TECHNOLOGY: UV (opt. Paramagnetic/ZrO_2)

909

MEASURES: H_2S, SO_2, NO, NO_2, NOx, NH_3, Optional O_2

RANGE

Species measured	Minimum full scale	Maximum full scale
SO_2	250 ppm	100%
NO	250 ppm	100%
NO_2	250 ppm	100%
H_2S	250 ppm	100%
NH_3	250 ppm	100%
Cl_2	250 ppm	100%

ACCURACY
±1% full scale of standard ranges

PROCESS
Sulfur Recovery

APPLICATION
CEM, Mass Flow Single Gas

TECHNOLOGY: UV

919

MEASURES: H_2S, SO_2, NO, NO_2, NOx, NH_3, Optional O_2

RANGE

Species measured	Minimum full scale	Maximum full scale
SO_2	250 ppm	100%
NO	250 ppm	100%
NO_2	250 ppm	100%
H_2S	250 ppm	100%
NH_3	250 ppm	100%
Cl_2	250 ppm	100%

ACCURACY
±1% full scale of standard ranges

PROCESS
Sulfur Recovery

APPLICATION
CEM Single Gas
(no mass flow)

TECHNOLOGY: UV

910

MEASURES: H_2S, SO_2, NO, NO_2, NOx, NH_3, Optional O_2

RANGE

Species measured	Minimum full scale	Maximum full scale
SO_2	250 ppm	100%
NO	250 ppm	100%
NO_2	250 ppm	100%
NOx	250 ppm	100%
H_2S	250 ppm	100%
NH_3	250 ppm	100%
Cl_2	250 ppm	100%

ACCURACY
±1% full scale of standard ranges

PROCESS
Sulfur Recovery

APPLICATION
CEM, Mass Flow Multi Gas

TECHNOLOGY: UV

920

MEASURES: H_2S, SO_2, NO, NO_2, NOx, NH_3, Optional O_2

RANGE

Species measured	Minimum full scale	Maximum full scale
SO_2	250 ppm	100%
NO	250 ppm	100%
NO_2	250 ppm	100%
NOx	250 ppm	100%
H_2S	250 ppm	100%
NH_3	250 ppm	100%
Cl_2	250 ppm	100%

ACCURACY
±1% full scale of standard ranges
±2.0% full scale of standard ranges for $H_2S + NH_3$ application

PROCESS
Sulfur Recovery

APPLICATION
CEM Multi Gas
(no mass flow)

TECHNOLOGY: UV

931/932

MEASURES: H_2S, Optional COS, CS_2, NH_3, SO_2, H_2, CO_2

RANGE
H_2S: ppm ranges to high percent levels
H_2: 0 to 5% or 0 to 10%
Other components and ranges are available upon request

ACCURACY
Standard range (UV): ±1% of full scale of standard ranges
Optional (TCD) H_2 sensor for TGTU applications: ±2% on a 0 to 10% range

PROCESS
Sulfur Recovery

APPLICATION
Feed Forward/TGTU

TECHNOLOGY: UV/TCD

930

MEASURES: H_2S, SO_2

RANGE

Species measured	Maximum full scale
H_2S	0-4%
SO_2	0-2%

(other ranges available on request)

ACCURACY
±1% full scale of standard ranges

PROCESS
Sulfur Recovery

APPLICATION
Sulfur Pit

TECHNOLOGY: UV

934

MEASURES: H_2

RANGE
0 to 5% or 0 to 10%

ACCURACY
±2% on a 0-10% range
±4% on a 0-5% range

PROCESS
Sulfur Recovery

APPLICATION
TGTU Efficiency

TECHNOLOGY: TCD

914

MEASURES: H_2S, SO_2, NO, NO_2, NOx, CO_2, O_2

Designed to meet regulatory reporting requirements for CEM

ACCURACY
Designed to meet customer specifications

PROCESS
Emissions Control

APPLICATION
CEM (cold-dry)

TECHNOLOGY: UV, NDIR, Paramagnetic

3050-OLV

MEASURES: H_2O

RANGE
0.1 to 2,500 ppmv
Readout capability in ppmw, lb/mmscf, mg/Nm³, and dew point temperature in °C or °F (requires process pressure as an input)

ACCURACY
±0.1 ppmv or ±10% of reading, whichever is greater

PROCESS
Continuous Catalyst Regeneration

APPLICATION
Hydrogen Recycle Gas

AVAILABLE OPTION:
AMEVision for 3050 series

TECHNOLOGY: QCM

5000

MEASURES: H_2O

RANGE
0 to 1000 ppmv, trend indication above 1000 ppmv
Output capability in lb./mmscf and dew point temperature (requires sample line pressure as analog input; single point systems only)

ACCURACY
±1 ppmv or ±5% of reading, whichever is greater

PROCESS
Continuous Catalyst Regeneration

APPLICATION
Hydrogen Recycle Gas

TECHNOLOGY: QCM

5100HD

MEASURES: CO, CO_2, O_2, H_2O, H_2S

RANGE
ppmv to % level, application dependent

ACCURACY
±2% of reading (typical)

PROCESS
Ethylene Production, Refining, Emission Compliance

APPLICATION
Acetylene Conversion Rate, CO and CO_2 Levels in Furnace Decoking, Moisture in Continuous Catalyst Regeneration, Moisture in Hydrogen Recycle Gas, Moisture in Olefins (UOP Catalytic Regeneration), H_2S in Flare and Refinery Fuel Gas

Consult AMETEK for more potential applications

TECHNOLOGY: TDLAS

ta3000R

MEASURES: CO

RANGE
0 to 3 ppmv

ACCURACY
±10 ppbv or ±10% of reading, whichever is greater

PROCESS
PE/PP Production, Ethylene/ Propylene Feedstock

APPLICATION
Catalyst Protection

TECHNOLOGY: GC-RGD

WDG-V

MEASURES: O_2, Combustibles ($CO+H_2$), Methane/ Hydrocarbons (CH_4+)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: 0-2,000 ppmv
Hydrocarbon: 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full-scale output range
Hydrocarbon: ±5% of full scale output range

PROCESS
Fired Heaters, Power Generation

APPLICATION
Combustion Control in Ethane Reformers, Steam Boilers, Process Heaters, Thermal Oxidizers

TECHNOLOGY: ZrO_2, Catalytic Sensors

WDG-V UOP

MEASURES: O_2

RANGE
From 0-1% to 0-100%

ACCURACY
±0.75% of measured value or ±0.05%, whichever is greater

PROCESS
Catalytic Reforming/Platforming, Continuous Catalyst Regeneration (CCR)

APPLICATION
Oxygen Monitoring in CCR

TECHNOLOGY: ZrO_2

WDG Insitu

MEASURES: O_2

RANGE
0-1% to 0-100%

ACCURACY
±1% of measured value or ±0.05%, whichever is greater

PROCESS
Fired Heaters, Power Generation

APPLICATION
Oxygen Monitoring in Power and Steam Boilers, Process Heaters, Thermal Oxidizers

TECHNOLOGY: ZrO_2

682T-HP

MEASURES: Sulfur

RANGE
Analysis range for sulfur of 0.02-6.0%

ACCURACY
Repeatability: Typical 1 sigma precision for (100 sec.):
10% relative at 0.04 wt. % sulfur
5% relative at 0.1 wt. % sulfur
0.1% relative at 3.24 wt. % sulfur

PROCESS
Blending Operations, Marine Fuel

APPLICATION
Sulfur Concentration in Crude Oil, Blending Operations, Marine Bunker Fuel

TECHNOLOGY: X-Ray Transmission

METALS & MINING

Ready to face the challenge

AMETEK Process Instruments' expertise delivers a solution that ensures safety, quality and efficiency in the high-heat environment of metals and mining.

Using our accurate technologies – including TDLAS lasers, mass spectrometers and UV analyzers – we provide the measurements you require, from furnace control to emissions reduction.

WDG-V

MEASURES: O_2, Combustibles ($CO+H_2$), Methane/Hydrocarbons (CH_4+)

RANGE
O_2: From 0-1 to 0-100%
Combustibles: 0-2,000 ppmv
Hydrocarbon: 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range
Hydrocarbon: ±5% of full scale output range

PROCESS
Foundry/Metals Production Furnaces, Power Generation

APPLICATION
Combustion Control and Oxygen Monitoring in Reheat Furnaces and Power and Steam Boilers

TECHNOLOGY: ZrO_2, Catalytic Sensors

WDG-HPII

MEASURES: O_2, Combustibles ($CO+H_2$), Option for Excess Fuel

RANGE
O_2: From 0-1% to 0-100%
Combustibles: From 0-2,000 ppmv to 0-10,000 ppmv or from 0-1% to 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range

PROCESS
Foundry/Metals Production Furnaces, Kilns

APPLICATION
Combustion Control and Oxygen Monitoring in Blast Furnace Stoves, Reheat Furnaces and Lime Kilns; Excess Fuel Monitoring of Graphite Electrodes in Electric Arc Furnaces (with Excess Fuel Option)

TECHNOLOGY: ZrO_2, Catalytic Sensor

WDG Insitu

MEASURES: O_2

RANGE
0-1% to 0-100%

ACCURACY
±1% of measured value or ±0.05%, whichever is greater

PROCESS
Coke Ovens, Power Generation

APPLICATION
Process Oxygen Monitoring in Coke Ovens and Power and Steam Boilers

TECHNOLOGY: ZrO_2

9900RM

MEASURES: SO_2, F_2, Uranium

RANGE
ppmv/ppmw to 100%, application dependent

ACCURACY
Better than ±1.0% of standard full scale range

PROCESS
Emissions Compliance

APPLICATION
Emissions

TECHNOLOGY: UV

METALS & MINING

IPS-4

MEASURES: SO_2, F_2, Uranium

RANGE
ppmv/ppmw to 100%, application dependent

ACCURACY
UV: ±1% of full scale range
IR: ±2% of full scale range
Dual Bench: ±2% of full scale typical

PROCESS
Emission Compliance

APPLICATION
Emissions

TECHNOLOGY: UV/NDIR

5100HD

MEASURES: CO, CO_2, O_2, H_2O, CH_4, H_2S

RANGE
ppmv to % level, application dependent

ACCURACY
±2% of reading (typical)

PROCESS
Operations

APPLICATION
Safety, Emissions, Operational Efficiency Monitoring

TECHNOLOGY: TDLAS

NATURAL GAS

Proven technologies for critical measurements

With extensive experience and continuous product development, AMETEK Process Instruments provides a comprehensive portfolio of specialized solutions, utilizing advanced technologies to provide vital analysis across the full range of natural gas processes.

From drilling to gas processing and transmission to the production of liquefied natural gas (LNG), we have the process instrumentation to ensure natural gas meets quality specifications and tariff requirements for gas treating, processing, transmission, and end use as a fuel or feedstock.

3050-OLV

MEASURES: H_2O

RANGE
0.1 to 2,500 ppmv
Readout capability in ppmw, lb/mmscf, mg/Nm³, and dew point temperature in °C or °F (requires process pressure as an input)

ACCURACY
±0.1 ppmv or ±10% or reading, whichever is greater

PROCESS
Dehydration, Transmission Pipelines, Underground Storage

APPLICATION
Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits

AVAILABLE OPTION:
AMEVision for 3050 series

TECHNOLOGY: QCM

3050-SLR

MEASURES: H_2O

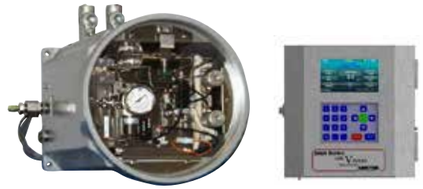
RANGE
0.1 to 100 ppmv.
Readout capability in ppmw, lb/mmscf, mg/Nm³, and dew point temperature in °C or °F (requires process pressure as an input)

ACCURACY
±0.03 ppmv or ±10% of reading, whichever is greater

PROCESS
Dehydration, Transmission Pipelines, LNG

APPLICATION
Glycol Contactor Efficiency, Dryer Efficiency & Breakthrough, Custody Transfer Tariff Limits, Feed Gas Quality for LNG Liquefaction

AVAILABLE OPTION:
AMEVision for 3050 series



TECHNOLOGY: QCM

3050-DO

MEASURES: H_2O

RANGE
0.02 to 100 ppmv
Readout capability in ppmw, lb/mmscf, mg/Nm³, and dew point temperature in °C or °F (requires process pressure as an input)

ACCURACY
±0.02 ppmv or ±10% of reading, whichever is greater

PROCESS
Dehydration, LPG & NGL Fractionation, LNG

APPLICATION
Dryer Efficiency and Breakthroug

AVAILABLE OPTION:
AMEVision for 3050 series

TECHNOLOGY: QCM

3050-TE

MEASURES: H_2O

RANGE
0.01 to 100 ppmv
Readout capability in ppmw, lb/mmscf, mg/Nm³, and dew point temperature in °C or °F (requires process pressure as an input)

ACCURACY
±0.01 ppmv or ±10% of reading, whichever is greater

PROCESS
LNG, LPG & NGL Fractionation

APPLICATION
Feed Gas Quality to Turbo Expander

AVAILABLE OPTION:
AMEVision for 3050 series

TECHNOLOGY: QCM

NATURAL GAS

5100

MEASURES: CO_2, H_2O, H_2S

RANGE
0.25-60 lb/MMscf/4-1900 mg/m³ (5 to 2500 ppmv)
Other ranges available

ACCURACY
±4 ppmv or ±2% of reading, whichever is greater

PROCESS
Sweetening, Dehydration, Transmission Pipelines, Underground Storage

APPLICATION
Amine and Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits

TECHNOLOGY: TDLAS

5100HD

MEASURES: CO, CO_2, O_2, H_2O, H_2S

RANGE
H_2O: 0.25 to 60 lbs
CO_2: 0-50 ppmv to 0-100%
H_2S: 0-300 ppmv to 0-100%

ACCURACY
H_2O: ±4 ppmv or ±2% of reading, whichever is greater
CO_2: range dependent
H_2S: range dependent

PROCESS
Dehydration, Sweetening, Transmission Pipelines, Underground Storage, LNG

APPLICATION
Amine and Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits, Feed Gas Quality for LNG Liquefaction

TECHNOLOGY: TDLAS

5100P

MEASURES: Moisture, CO_2

RANGE
Moisture: 0 to 2500 ppmv
CO_2: 0-2%

ACCURACY
±4 ppmv, or ±2% of reading, whichever is greater

PROCESS
Dehydration, Transmission Pipelines, Underground Storage

APPLICATION
Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits

TECHNOLOGY: TDLAS

933

MEASURES: H_2S, COS, CH_3SH

RANGE
H_2S: 0 to 3 ppmv min.; 0 to 100 ppmv max.
COS: 0 to 15 ppmv min.; 0 to 500 ppmv max.
MeSH: 0 to 9 ppmv min.; 0 to 250 ppmv max.

ACCURACY
Standard range: ±2% of full scale
Low range: ±5% of full scale

PROCESS
Sweetening, Transmission Pipelines, LNG, Underground Storage

APPLICATION
Amine and Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits, Feed Gas Quality for LNG Liquefaction

TECHNOLOGY: UV/IR

931/932

MEASURES: H_2S, Optional COS, CS_2, NH_3, SO_2, H_2, CO_2

RANGE
H_2S: ppmv ranges to high percent levels
H_2: 0 to 5% or 0 to 10%
Other components and ranges are available upon request

ACCURACY
Standard range (UV): ±1% of full scale
Optional (TCD) H_2 sensor for TGTU applications: ±2% on a 0 to10% range; ±4% on a 0 to 5% range
Optional (IR) sensor for THC, CO_2: application specific, consult factory

PROCESS
Drilling Wells, Sweetening, Transmission Pipelines, Underground Storage, LNG

APPLICATION
Amine and Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits, Feed Gas Quality for LNG Liquefaction

TECHNOLOGY: UV/TCD/IR

241CE II

MEASURES: Hydrocarbon Dew Point Temperature

RANGE
Cooling capability: Typically 60°C below the temperature at the analyzer installation
Highest measurable dew point: Application dependent, typically 15°C below the temperature at the analyzer installation

ACCURACY
Hydrocarbon dew point temperature ±1°C

PROCESS
Dehydration, Drilling/Wells, Transmission Pipelines, LPG & NGL Fractionation

APPLICATION
Glycol Contactor Efficiency, Dryer Efficiency & Breakthrough, Custody Transfer Tariff Limits, Liquids Separation

TECHNOLOGY: Chilled Mirror

Chanscope II

MEASURES: H_2O and Hydrocarbon Dew Point Temperature

RANGE
Dew point temperature ranges: -29°C to ambient, with liquid propane; -62°C to ambient, with liquid carbon dioxide; -129°C to ambient, with optional liquid nitrogen chiller

ACCURACY
±0.2°C at 40°C to -90°C

PROCESS
Dehydration, Transmission Pipelines, LPG & NGL Fractionation, Underground Storage, Drilling/Wells

APPLICATION
Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits, Liquids Separation

TECHNOLOGY: Chilled Mirror

Model 13

MEASURES: H_2O and Hydrocarbon Dew Point Temperature

RANGE
Dew point temperature range dependent on which thermometer is chosen

ACCURACY
±0.25°C

PROCESS
Dehydration, Transmission Pipelines, LPG & NGL Fractionation, Underground Storage, Drilling/Wells

APPLICATION
Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits, Liquids Separation

TECHNOLOGY: Chilled Mirror

303B

MEASURES: H_2O

RANGE
0 to 1000 ppmv
(0-2000 ppmv range with reduced sample flow)

ACCURACY
±0.5 ppmv or ±5.0% of reading, whichever is greater

PROCESS
Dehydration, Transmission Pipelines, Underground Storage, LNG

APPLICATION
Glycol Contactor Efficiency, Transmission Sales Gas Quality, Custody Transfer Tariff Limits, Feed Gas Quality for LNG Liquefaction

TECHNOLOGY: P_2O_5

IPS-4

MEASURES: HC, NH_3, H_2O, CO_2, Cl_2, $FeCl_3$, CH_3I, SO_2, H_2S, NO, NO_2, ClO_2, NOx, H_2S in rich amine, ASTM color standards, Bisphenol-A, Ethylene Glycol

RANGE
ppmv/ppmw to 100%, application dependent

ACCURACY
UV: ±1% of full scale range
IR: ±2% of full scale range
Dual Bench: ±2% of full scale typical

PROCESS
Gas Sweetening

APPLICATION
Rich Amine

TECHNOLOGY: UV/NDIR

OXYvisor

MEASURES: O_2

RANGE
Sensor dependent:
BOS1: 0-5% O_2
BOS2: 0-100% O_2
BOS3: 0-300 parts per million by volume (ppmv) with over-range of 1000 ppmv

ACCURACY
Sensor dependent:
BOS1: ±0.002% O_2 or ±3% of the measured value, whichever is greater
BOS2: ±0.4% O_2 at 20.9% O_2, ±0.05% O_2 at 0.2% O_2
BOS3: ±2 ppm or ±5% of measured value, whichever is greater

PROCESS
Pipeline quality and custody transfer, Inlet feed to gas plant, Wellhead piping leading to production manifold, Inlet and outlet on the amine absorber, Blanket gas on amine storage tank, Biomethane production

APPLICATION
Parts per million or percent measurements of O_2 in natural gas

TECHNOLOGY: Optical Luminescent Oxygen

PHARMACEUTICAL

The remedy for your process requirements

Pharmaceutical applications require outstanding sensitivity and stability combined with accurate real-time monitoring.

AMETEK Process Instruments delivers field-proven systems that provide the multi-component analysis required for fermentation process control and drying while offering compact designs and ease of operation.

PHARMACEUTICAL

WDG-V

MEASURES: O_2, Combustibles ($CO+H_2$), Methane/Hydrocarbons (CH_4+)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: 0-2,000 ppmv
Hydrocarbon: From 0-1% to 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range
Hydrocarbon: ±5% of full scale output range

PROCESS
Fired Heaters, Power and Steam Generation

APPLICATION
Combustion Control in Process Heaters, Power and Steam Boilers, Thermal Oxidizers

TECHNOLOGY: ZrO_2, Catalytic Sensors

WDG-HPII

MEASURES: O_2, Combustibles ($CO+H_2$)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: From 0-2,000 ppmv to 0-10,000 ppmv or from 0-1% to 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range

PROCESS
Lime Kilns

APPLICATION
Combustion Control

TECHNOLOGY: ZrO_2, Catalytic Sensor

5100HD

MEASURES: O_2, H_2O

RANGE
H_2O: ppmv to % level, application dependent
O_2: 0-5%; 0-25%

ACCURACY
O_2: ±0.2%

PROCESS
Drying Operations

APPLICATION
Moisture in Final Product, Oxygen Concentration in Dryers

TECHNOLOGY: TDLAS

POWER & STEAM GENERATION

The power to control your process

Controlling the ratio of air and combustibles in combustion is key to safety, fuel efficiency and cost-effectiveness.

With a wealth of experience in providing power generation solutions, AMETEK Process Instruments has developed a range of products using proven zirconium oxide oxygen sensing for accurate combustion control.

WDG-V

MEASURES: O_2, Combustibles ($CO+H_2$), Methane/Hydrocarbons (CH_4+)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: 0-2,000 ppmv

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range
Hydrocarbon: ±5% of full scale output range

PROCESS
Power and Steam Boilers

APPLICATION
Combustion Control

TECHNOLOGY: ZrO_2, Catalytic Sensors

WDG-V Blowback

MEASURES: O_2, Combustibles ($CO+H_2$), Methane/Hydrocarbons (CH_4+)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: 0-2,000 ppmv
Hydrocarbon: 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range
Hydrocarbon: ±5% of full scale output range

PROCESS
Coal Fired Boilers, High Particulate/Dusty Processes

APPLICATION
Combustion Control for Boilers

TECHNOLOGY: ZrO_2, Catalytic Sensors

WDG Insitu

MEASURES: O_2

RANGE
From 0-1% to 0-100% O_2

ACCURACY
±1% of measured value or ±0.05%, whichever is greater

PROCESS
Power and Steam Boilers, Recovery Boilers

APPLICATION
Oxygen Monitoring in Boilers, Stratification

TECHNOLOGY: ZrO_2

WDG 1200/1210

MEASURES: O_2

RANGE
0-1% up to 0-25% v/v O_2

ACCURACY
Accuracy: ±1% of measured value or ±0.05%, whichever is greater

PROCESS
Power and Steam Boilers

APPLICATION
Oxygen Monitoring in Boilers

TECHNOLOGY: ZrO_2

WDG-HPII

MEASURES: O_2, Combustibles ($CO+H_2$)

RANGE
O_2: from 0-1% to 0-100%
Combustibles: from 0-2,000 ppmv to 0-10,000 ppmv or from 0-1% to 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range

PROCESS
Coal Fired Boilers, Waste Wood Boilers, Biofuel Boilers, Recovery Boilers, High Particulate/Dusty Processes

APPLICATION
Combustion Control

TECHNOLOGY: ZrO_2, Catalytic Sensor

5100HD

MEASURES: CO, CH_4, O_2

RANGE
ppmv to % level, application dependent

ACCURACY
CH_4 and CO: ±2% of reading
O_2: ±0.2%

PROCESS
Combustion

APPLICATION
Safety and Operational Efficiency Monitoring

TECHNOLOGY: TDLAS

3050-OLV

MEASURES: H_2O

RANGE
0.1 to 2,500 ppmv
Readout capability in ppmw, lb/mmscf, mg/Nm^3, and dew point temperature in °C or °F (requires process pressure as an input)

ACCURACY
±0.1 ppmv or ±10% of reading, whichever is greater

PROCESS
Hydrogen Cooled Electric Generators

APPLICATION
Moisture Control

AVAILABLE OPTION:
AMEVision for 3050 series

TECHNOLOGY: QCM

PULP & PAPER, GLASS, CEMENT & LIME

Expertise in action

AMETEK Process Instruments' extensive knowledge of combustion control and emissions monitoring plays a key role in industries such as pulp and paper, glass, and cement and lime.

Our trusted zirconium oxide (ZrO_2) analyzers provide important oxygen measurements, while we offer critical measurements for sulfur dioxide and NOx waste products.

PULP & PAPER, GLASS, CEMENT & LIME

CMFA-P2000

MEASURES: Excess O_2 or Excess Fuel

RANGE
100% to 0.1% excess O_2 and 0.1% to 50% excess fuel

ACCURACY
Excess O_2: ±2% of measured value or ±0.1%, whichever is greater
Excess Fuel: ±5% of measured value or ±0.25%, whichever is greater
Specifications based on 0-15% range, natural gas

PROCESS
Fiberglass Strand and Glass Container Melt Tanks/Forehearths, Ribbon Burners on Flame Treating Lines, Brazing Machines (pre-heat, flux, and braze)

APPLICATION
Portable Oxygen and Air/Fuel Mixture Monitoring to Control Product Quality in Glass & Fiber Manufacturing

TECHNOLOGY: ZrO_2

WDG-V Blowback

MEASURES: O_2, Combustibles ($CO+H_2$), Methane/Hydrocarbons (CH_4+)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: 0-2,000 ppmv
Hydrocarbon: 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range
Hydrocarbon: ±5% of full scale output range

PROCESS
Fired Heaters, Process Generation, Process Furnaces, Kilns

APPLICATION
Combustion Control

TECHNOLOGY: ZrO_2, Catalytic Sensors

PreMix 2000

MEASURES: Excess O_2 or Excess Fuel

RANGE
All or selected portions of the range from 100% to 0.1% excess O_2 and 0.1% to 50% excess fuel

ACCURACY
Excess O_2: ±2% of measured value or ±0.1%, whichever is greater
Excess Fuel: ±5% of measured value or 0.25%, whichever is greater

PROCESS
Fiberglass Spinner Blowers/Day Pots, Technical Glass Forming Furnaces

APPLICATION
Control of Product Quality via Oxygen and Air/Fuel Mixture Monitoring in Glass and Fiber Manufacturing

TECHNOLOGY: ZrO_2

WDG-HPII

MEASURES: O_2, Combustibles ($CO+H_2$)

RANGE
O_2: From 0-1% to 0-100%
Combustibles: From 0-2,000 ppmv to 0-10,000 ppmv or from 0-1% to 0-5%

ACCURACY
O_2: ±0.75% of measured value or ±0.05%, whichever is greater
Combustibles: ±2% of full scale output range

PROCESS
Kilns, Power Generation, Process Furnaces

APPLICATION
Combustion Control and Oxygen Monitoring in Rotary Kilns, Power and Steam Boilers, Black Liquor Recovery Boilers, Multiple Hearth Furnaces, Glass Melting Tank Exhaust

TECHNOLOGY: ZrO_2,, Catalytic Sensor

PULP & PAPER, GLASS, CEMENT & LIME

IPS-4

MEASURES: SO_2, NOx, ClO_2, CO

RANGE
ppmv to 100%

ACCURACY
UV: ±1% of full scale range
IR: ±2% of full scale range
Dual Bench: ±2% of full scale typical

PROCESS
Emission Compliance

APPLICATION
Pulp Bleaching, Emissions Compliance

TECHNOLOGY: UV/NDIR

9900RM

MEASURES: SO_2, NOx, ClO_2

RANGE
ppmv/ppmw to 100%, application dependent

ACCURACY
Better than ±1.0% of standard full scale range

PROCESS
Emission Compliance

APPLICATION
Emissions

TECHNOLOGY: UV

5100HD

MEASURES: CO, CH_4, O_2

RANGE
ppmv to % level, application dependent

ACCURACY
±2% of reading

PROCESS
Combustion

APPLICATION
Safety and Operational Efficiency Monitoring

TECHNOLOGY: TDLAS

9900WM

MEASURES: SO_2, TRS, ClO_2

RANGE
ppmv/ppmw to 100%, application dependent

ACCURACY
Better than ±1.0% of standard full scale range

PROCESS
Emission Compliance

APPLICATION
Emissions

TECHNOLOGY: UV

SEMICONDUCTOR, LCD/OLED DISPLAY MANUFACTURING & INDUSTRIAL GASES

Accurate monitoring of moisture and impurity contamination

Moisture contamination and the presence of trace impurities in semiconductor manufacturing are major causes of defects and process variations, significantly impacting yield.

This makes the analysis of moisture and trace impurities essential, both for cleanroom areas where semiconductor wafers are produced and stored, and for the ultra-high purity gases used in manufacturing processes.

A variety of methods are available for measuring moisture and other impurities from high levels to trace amounts. Many manufacturing applications rely on trace measurements of water vapor and other impurities to ensure process quality is maintained.

5910

MEASURES: H_2O

RANGE
0 to 150 ppbv
Trend indication to 1000 ppbv

ACCURACY
±100 ppbv or ±10% of the reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

5920

MEASURES: H_2O

RANGE
0 to 150 ppbv
Trend indication to 1000 ppbv

ACCURACY
±1 ppbv or ±10% of the reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

5800

MEASURES: H_2O

RANGE
0.02 to 100 ppmv
Indicates trend to 1000 ppmv

ACCURACY
±20 ppbv or ±5% of the reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

5830

MEASURES: H_2O

RANGE
0 to 100 ppmv
Indicates trend to 1000 ppmv

ACCURACY
±20 ppbv or ±10% of the reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

SEMICONDUCTOR, LCD/OLED DISPLAY MANUFACTURING & INDUSTRIAL GASES

3050-AMS

MEASURES: H_2O

RANGE
0.035 to 100 ppmv
Indicates trend to 1000 ppmv

ACCURACY
±0.035 ppmv or ±10%, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

3050-AM

MEASURES: H_2O

RANGE
0.1 to 100 ppmv
Indicates trend to 1000 ppmv

ACCURACY
±0.1 ppmv or ±10%, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

3050-RM

MEASURES: H_2O

RANGE
0.1 to 2,500 ppmv
Readout capability in ppmw, lb/mmscf, mg/Nm³, and dew point temperature in °C or °F

ACCURACY
±0.1 ppmv or ±10%, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

2850

MEASURES: H_2O

RANGE
0.1 to 1000 ppmv

ACCURACY
±0.05 ppmv or ±5% of the reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: QCM

ta7000

MEASURES: H_2, CO, CO_2, CH_4, NMHC

RANGE
0 to 199.9 ppbv

ACCURACY
±1 x LDL or ±10% of reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: GC-RGD/FID

ta5000

MEASURES: CO, CO_2, H_2, CH_4, NMHC

RANGE
RGD: 0-3 ppmv
FID: 0-5 ppmv

ACCURACY
±1 x LDL or ±10% of reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: GC-RGD/FID

ta3000

MEASURES: CO, CO_2, H_2, CH_4, NMHC

RANGE
RGD: 0-3 ppmv
FID: 0-5 ppmv

ACCURACY
±10 ppbv or ±10% of reading, whichever is greater

PROCESS
Gas Purification

APPLICATION
Quality

TECHNOLOGY: GC-RGD/FID

CEM O_2/TM

MEASURES: O_2

RANGE
1 ppm to 100% O_2

ACCURACY
±0.75 of reading or 0.05% O_2, whichever is greater;
ppm: ±2 of reading or 0.5 ppm O_2 absolute, whichever is greater

PROCESS
Specialty gas production, ultra-high purity of inert gases

APPLICATION
Trace Oxygen Measurement

TECHNOLOGY: ZrO_2

LC-D

MEASURES: All components m/z 1-300

RANGE
Total Pressure ≤10^{-5} torr

ACCURACY
Source sensitivity (Faraday cup): 2 x 10-4 amps per Torr at detector (measured with nitrogen at mass 28) with peak width = 0.5 at 10% height and 1 x 10-3 amps emission current

PROCESS
Chemical Vapor Deposition, Physical Vapor Deposition, Rapid Thermal Processing

APPLICATION
Quality

TECHNOLOGY: Mass Spectrometer

Dymaxion

MEASURES: All components m/z 1-300

RANGE
1-100, 1-200, 1-300 AMU

ACCURACY
Source sensitivity (Faraday cup): 2 x 10-4 amps per Torr at detector (measured with nitrogen at mass 28) with peak width = 0.5 at 10% height and 1 x 10-3 amps emission current

PROCESS
Chemical Vapor Deposition, Physical Vapor Deposition, Rapid Thermal Processing

APPLICATION
Quality

TECHNOLOGY: Mass Spectrometer

CG1000

MEASURES: O_2

RANGE
0.1 ppmv O_2 to 100% O_2

ACCURACY
±2% of reading or 0.05% absolute, whichever is greater

PROCESS
Rapid Thermal Processing (RTP), Air Separation, Inert Gas Purity (N_2, Ar, CO_2 , He, etc.), Blanket/Purge Gases, Glove Box Applications, Cryogenic Gas Generation, Atmospheric Oven/Furnace Control, UV Curing Ovens

APPLICATION
Trace Oxygen Monitoring for Quality Control of Inert Gas and High Purity Streams

TECHNOLOGY: ZrO_2

TM2000

MEASURES: O_2

RANGE
0.1 ppmv O_2 to 100% O_2

ACCURACY
± 1% of reading or 0.02% absolute, whichever is greater

PROCESS
Air Separation, Inert Gas Purity (N_2, Ar, CO_2 , He, etc.), Blanket/Purge Gases, Glove Box Applications, Cryogenic Gas Generation, Atmospheric Oven/Furnace Control, UV Curing Ovens

APPLICATION
Trace Oxygen Monitoring for Quality Control of Inert Gas and High Purity Streams

TECHNOLOGY: ZrO_2

OTHER APPLICATIONS

Versatile, customized solutions

Our expertise and industry-leading technologies can be used in a range of applications across a variety of industries. If your process demands accurate, high-quality gas analysis, backed by global support and servicing, AMETEK Process Instruments delivers.

Additionally, to ensure accurate and reliable process measurements, a representative sample of the process fluid must be delivered to the analyzer. A well-designed sample conditioning system will consider filtration, temperature, pressure, flow rate and environmental conditions. Installations may require a full analyzer shelter including analyzers, sample systems, calibration gases, HVAC controls, and power distribution.

Contact AMETEK Process Instruments or your local AMETEK representative for more information on our analyzers.

CABINETS, SHELTERS & HOUSES

WDG-VRM

MEASURES: Hot/Wet O_2 or Cold/Dry O_2

RANGE
From 0-1% to 0-100%

ACCURACY
±0.75% of measured value or ±0.05%, whichever is greater

PROCESS
Emission Monitoring

APPLICATION
Net Oxygen Measurement for CEM

TECHNOLOGY: ZrO_2

CEM/O_2

MEASURES: Wet O_2 or Dry O_2

RANGE
0.1% to 0-100%
FID: 0-5 ppmv

ACCURACY
±0.75% of measured value or ±0.05%, whichever is greater

PROCESS
Emission Monitoring

APPLICATION
Net Oxygen Measurement for CEM

TECHNOLOGY: ZrO_2

CEM Humox

MEASURES: Wet & Dry O_2, H_2O

RANGE
O_2: 0.1% to 100%
Moisture: 5% to 85% by volume

ACCURACY
O_2: ±0.75% of reading or ±0.05% absolute
Moisture: ±3% of reading or ±1% absolute, whichever is greater

PROCESS
Emission Monitoring

APPLICATION
Net Oxygen Measurement for CEM

TECHNOLOGY: ZrO_2

120HD

MEASURES: H_2

RANGE
0 to 25% H_2 in water-saturated air

ACCURACY
±4% full scale (±1% H2 v/v)

PROCESS
Turbine halls

APPLICATION
Lead-acid Battery Charging

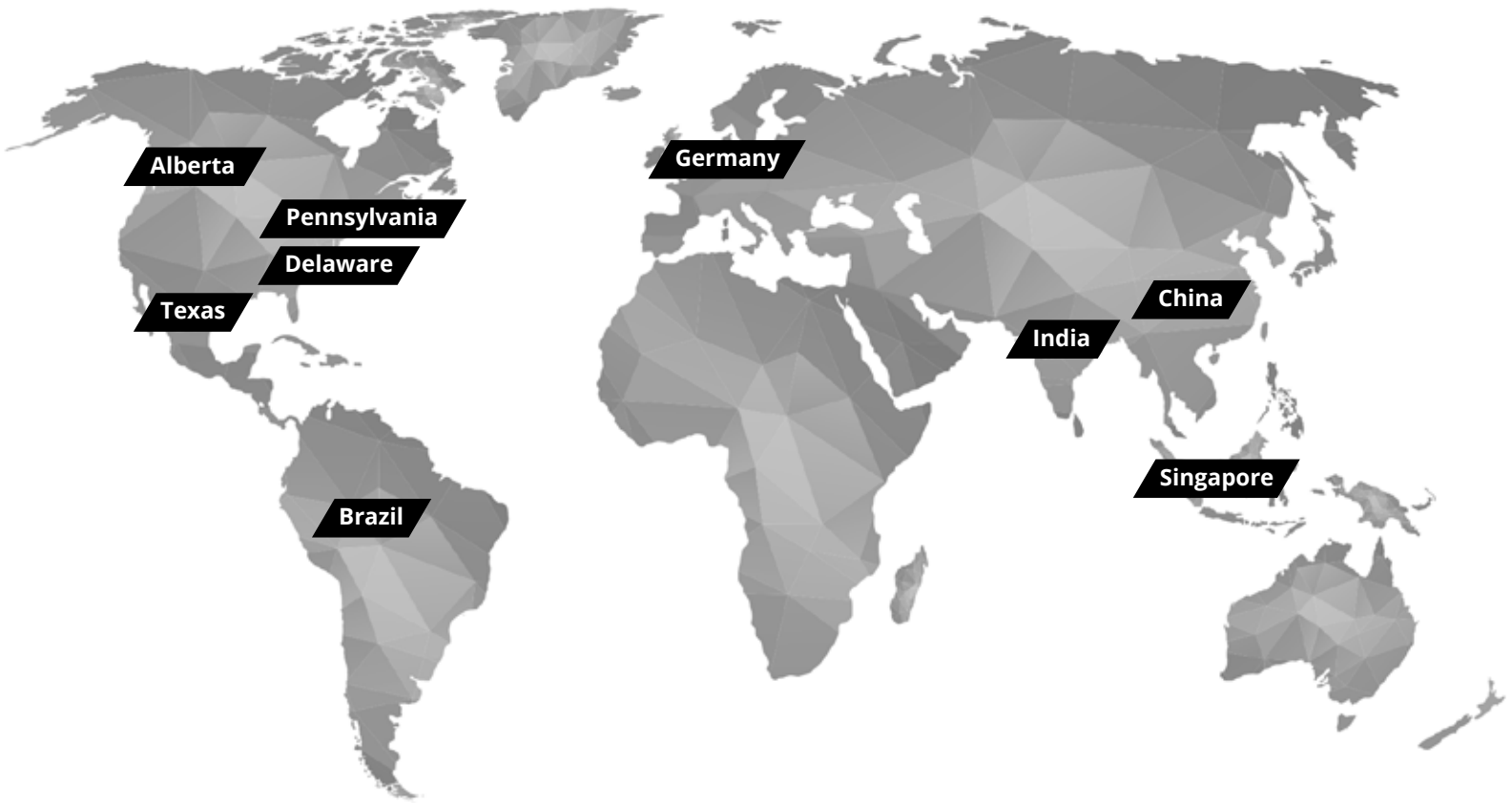
TECHNOLOGY: Katharometer

AMETEK Process Instruments delivers worldwide sales and service support through a network of direct and factory-trained global distribution channels.

AMETEK Service Assistance Program plans offer coverage up to 24 hours a day, 365 days of the year.

As worldwide experts in the manufacture of process analyzers and instrumentation, we have supplied solutions to industry since 1962, providing the widest range of analysis technology available.

Through process application consulting, we create custom-designed solutions that meet the needs of your specific application or process.



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AMETEK® PROCESS INSTRUMENTS

One of a family of innovative process analyzer solutions from AMETEK Process Instruments.
Specifications subject to change without notice.

Find the right solution for your process application

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