*COMBUSTION ANALYZERS FOR EVERY APPLICATION*

The Thermox product line offers the greatest selection of combustion analyzers in the industry for the measurement of oxygen, combustibles (CO), and hydrocarbons for process control and safety as well as fuel rich/ oxygen deficient atmospheres and PPM $O_2$ measurements for clean gas purity. Our commitment is to provide the appropriate analyzer configuration for every application to ensure the highest level of reliability and efficiency, cost savings, and safety for our customers.

**Fuel Efficiency and NOx Reduction**

Thermox $O_2$ combustion analyzers improves combustion control by providing feedback to the control system on how much excess oxygen is remaining after combustion verifying the excess air setpoint/ control. This excess air control point should be minimized at all firing points to achieve the highest level efficiency and fuel savings.

Thermox $O_2$ & Combustible combustion analyzers provide the additional measurement of Combustibles (CO) to enhance control strategies so that additional excess air reductions can be safely achieved without fear of fuel rich conditions to minimize NOx generation as well as additional fuel efficiency savings.

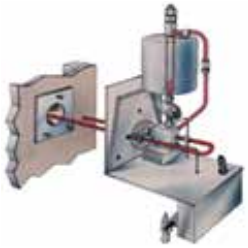
**Combustion Safety**

Thermox $O_2$, Combustibles, and Hydrocarbon combustion analyzers provide three independent process measurements that can be utilized in control safety interlocks and process shutdown as well as process control.

Low emission burners and aggressive firing control points to achieve increased efficiency and emission reductions has led the industry to realize tighter control leads to a potential higher probability of combustion “events” which need to be addressed . The need to add additional layers of safety to the Basic Process Control System (BPCS) to reduce the risk of a combustion event has become a high priority within industry and has led to implementation of Safety Instrumented Systems (SIS), independent of the Basic Process Control System (BPCS).

*CLOSE-COUPLED EXTRACTIVE COMBUSTION ANALYZERS*

Designed for fast response in a wide variety of combustion applications, these analyzers mount directly on the combustion process to provide a continuous measurement of excess oxygen or excess oxygen and combustibles in combustion exhaust gas. They are suitable for gas streams up to 1648°C (3000°F) and can be provided in a range of mounting styles to match process connections. For Hazardous area locations, purged or explosion proof versions are available.



CLOSE-COUPLED EXTRACTIVE

**WDG-V, WDG-VC, WDG-VCM**

The WDG-V Combustion Analyzer is designed to provide the complete solution for combustion process control and process control safety applications with redundancy and diagnostics to monitor performance and health as well as provide statistical data needed to implement Predictive and Proactive maintenance programs which will maximize the availability of the analyzer as well as decrease unnecessary verification and maintenance costs.

Process variables and diagnostic information are available from the analyzer with analog, discrete, MODBUS, and HART outputs. An optional AMEVision human-machine interface (HMI) can be supplied to provide a local display and keypad interface for the sensor and can be utilized as a host HMI for up to 8 sensors. SIL 2 Capable.

**WDG-IV, WDG-IVC, WDG-IVCM**

The WDG-IV Combustion Analyzer is designed for standard process control and NOx reduction strategies supplied with the combustion sensor for mounting to the process and Series 2000 controller mounted remote from the sensor up to 300 meters away.

Process variables and diagnostic information are available from the Series 2000 controller with analog and discrete outputs. The Series 2000 controller provides the interface to the sensor with four line display and keypad.

The WDG-IVCM analyzer measures oxygen, combustibles and methane in natural gas-fired applications. It is ideal for gas-fired power boilers or for those using natural gas during start-up and shutdown. With this analyzer, you can monitor oxygen and combustibles for maximum fuel efficiency. In addition, the methane detector can be used for purge and lightoff cycles during start-up and shutdown.

**WDG-HPII and WDG-HPIIC**

*CONVECTIVE FLUE GAS ANALYZERS*

Designed for applications with high particulate levels in the gas stream, the analyzer mounts directly on the combustion process to provide continuous measurement of oxygen (WDG-HPII) or oxygen and combustibles (WDG-HPIIC). This analyzer is suitable for gas streams up to 704°C (1300°F) using the standard 316SS probe/filter assembly. Flue gas temperatures up to 1537°C (2800°F) can be measured using optional high temperature probes. For corrosive gas streams, sample wetted parts in Hastelloy® or Inconel® are available. The analyzers can be provided in a range of mounting styles. For hazardous area locations, purged or explosion proof versions are available.

**Trace Oxygen Analyzers**

For nitrogen purity and other industrial applications, Thermox TM2000 and CG1000 series industrial gas oxygen analyzers provide a quick response time to process changes, and operate from 100% to 0.1 ppm $O_2$.

**Pre-Mix Gas Analyzers**

The Thermox PreMix 2000 and CMFA-P2000 (portable) analyzers accurately and continuously measure the proportions of oxygen and fuel in pre-mix gases. They are used wherever efficient control is required for an open flame combustion process such as in glass and fiber glass manufacturing, or in flame treating applications.

**Insitu Flue Gas Analyzer**

The Insitu model is a direct insertion-type oxygen probe where the zirconium oxide cell is directly in the stream of the products of combustion. The patented Insitu model is designed for applications where the flue gas temperature does not exceed 800°C (1472°F) and where combustibles measurements are not required.

*SIMPLIFIED CONSTRUCTION FOR EASY SERVICE*

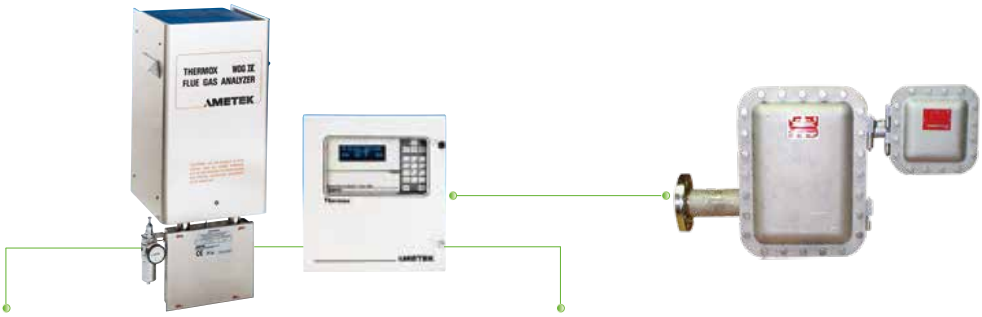
With the unique design of the Insitu oxygen probe, field replacement of all components is easily performed. While the outer protection tube remains in the process, the inner probe, housing the oxygen cell and heater/thermocouple assembly, can be removed easily. With no need to return the probe to the factory, extensive down time and expensive repairs on your oxygen insitu probe are avoided.

**For detailed information of each model, please refer to the product specification sheets.**


| Model | | WDG-Insitu/2000 | WDG 1200/INSITU | WDG 1210/INSITU |
|---|---|---|---|---|
| Installation/Sampling | | In-situ | In-situ | In-situ |
| Components | | $O_2$ | $O_2$ | $O_2$ |
| Output range | | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100% |
| Accuracy | | $O_2$: ±1% measured value or ±0.05% $O_2$ | $O_2$: ±1% measured value or ±0.05% $O_2$ | $O_2$: ±1% measured value or ±0.05% $O_2$ |
| Response time | | T63<20 Seconds | T63<20 Seconds | T63<20 Seconds |
| Max. Flue gas temperature, probe material/length | | 800°C, 310SS/9", 18", 36", 72", 108" | 800°C, 310SS/9", 18", 36", 72", 108" | 800°C, 310SS/9", 18", 36", 72", 108" |
| Analog output | | Two 4-20mA | 4-20mA | 4-20mA |
| Communication | | RS-485 | RS-485 Modbus | RS-485 Modbus |
| Sensor | Enclosure | NEMA 4X | NEMA 4X | NEMA 4X |
| | Ambient temperature | -20~71°C | -20~71°C | -20~71°C |
| | Explosion proof area | General purpose; Class 1, Division 2, Group A, B, C, D | General purpose | General purpose |
| Power | | Sensor: 115/230 VAC ±10%, 47-63 Hz, 150 VA; Control unit: 75 VA | 85-264 VAC, 48-62 Hz, 250 VA | 85-264 VAC, 48-62 Hz, 250 VA |
| Control unit | | 2000 | 2000 | 2000 |
| Sensor dimension H×W (mm) | | 160 × 160 | 153 × 152 | 153 × 152 |
| Main applications | | • Power generation<br>• Boiler<br>• Petrochemicals | • Power generation<br>• Boiler<br>• Process industry | • Power generation<br>• Boiler<br>• Process industry |
| Features | | Simple installation and operation | Simple installation and operation; Sensor and controller are integrated | Simple installation and operation |

* Above ambient temperature listed is for sensor. For 2000 control unit, ambient temperature is -10~50°C, Enclosure is NEMA 4, and 2000 control unit is UL Listed for NEC Class I, Division 2 areas.


| Model | | WDG-V | WDG-VC | WDG-VCM |
|---|---|---|---|---|
| Installation/Sampling | | Close-coupled, extractive | Close-coupled, extractive | Close-coupled, extractive |
| Components | | $O_2$ | $O_2$, Combustibles ($CO+H_2$) | $O_2$, Combustibles ($CO+H_2$), Hydrocarbons |
| Display range | | $O_2$: 0-100% | $O_2$: 0-100%; Combustibles: 0-10000ppm or 0-5% | $O_2$: 0-100%; Combustibles: 0-10000ppm or 0-5%; Hydrocarbons: 0-5% |
| **Output range** | | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100% Combustibles: 0-1000ppm with Overrange 0-2,000ppm to 0-10,000ppm, 0-2 to 0-5% | $O_2$: 0-1% to 0-100% Combustibles: 0-1000ppm with Overrange 0-2,000ppm to 0-10,000ppm, 0-2 to 0-5% Hydrocarbons: 0-5% |
| **Accuracy** | | $O_2$: ±0.75% measured value or ±0.05% $O_2$ | $O_2$: ±0.75% measured value or ±0.05% $O_2$; Combustibles: ±2% Full range | $O_2$: ±0.75% measured value or ±0.05% $O_2$; Combustibles: ±2% Full range; Hydrocarbons: ±5% Full range |
| Response time | | $O_2$: T90<9 Seconds | $O_2$: T90<20 Seconds for Combustibles | $O_2$: T90<20 Seconds for Hydrocarbons |
| Max. Flue gas temperature, probe material/length | | 704°C, 316SS/24"-108" 1024°C, 310SS/24"-108" 1649°C, Hexoloy™/24"-72" | 704°C, 316SS/24"-108" 1024°C, 310SS/24"-108" 1649°C, Hexoloy™/24"-72" | 704°C, 316SS/24"-108" 1024°C, 310SS/24"-108" 1649°C, Hexoloy™/24"-72" |
| Analog output | | Three 0/4-20mA | Three 0/4-20mA | Three 0/4-20mA |
| Communication | | 2 wire MODBUS RTU, 57.6 KBaud | | |
| Sensor | Enclosure | IP65 (NEMA 4) | IP65 (NEMA 4) | IP65 (NEMA 4) |
| | Ambient temperature | -25~65°C | -25~65°C | -25~65°C |
| | Explosion proof area | General purpose; Class 1, Division 2, Group B, C, D; or ATEX Zone 2, T3 with Purge | General purpose; Class 1, Division 2, Group B, C, D; or ATEX Zone 2, T3 with Purge | General purpose; Class 1, Division 2, Group B, C, D; or ATEX Zone 2, T3 with Purge |
| **Power** | | Sensor: 115 VAC, ±10%, 47-63 Hz, 740 VA max.; 230 VAC, ±10%, 47-63 Hz, 1950 VA max.; AMEVision: Nominal 115-230 VAC ±10%, 47-63 Hz, 75 VA max. | | |
| Interface | | MODBUS, AMEVision HMI, HART, Config. Software | MODBUS, AMEVision HMI, HART, Config. Software | MODBUS, AMEVision HMI, HART, Config. Software |
| **Sensor dimension H×W×D (mm)** | | 444.5 × 317.5 × 198 | 444.5 × 317.5 × 198 | 444.5 × 317.5 × 198 |
| Main applications | | • Petrochemicals • Chemicals • Process furnaces | • Petrochemicals • Chemicals • Process furnaces | • Petrochemicals • Chemicals • Process furnaces |
| Features | | Fast Response, Advanced Diagnostics, SIL 2 Capable | Fast Response, Advanced Diagnostics, SIL 2 Capable | Fast Response, Advanced Diagnostics, SIL 2 Capable |




| Model | | WDG-IV | WDG-IVC | WDG-IVCM | WDG-IV UOP/RP |
|---|---|---|---|---|---|
| Installation/Sampling | | Close-coupled, extractive | Close-coupled, extractive | Close-coupled, extractive | Close-coupled, extractive |
| Components | | $O_2$ | $O_2$, Combustibles ($CO+H_2$) | $O_2$, Combustibles ($CO+H_2$), $CH_4$ | $O_2$ |
| Display range | | $O_2$: 0-100% | $O_2$: 0-100%; Combustibles: 0-10000ppm or 0-5% | $O_2$: 0-100%; Combustibles: 0-10000ppm or 0-5%; $CH_4$: 0-5% | 0-100% |
| Output range | | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100% Combustibles: 0-2000ppm to 0-10000ppm or 0-1% to 0-5% | $O_2$: 0-1% to 0-100% Combustibles: 0-2000ppm to 0-10,000ppm or 0-1% to 0-5%; $CH_4$: 0-2% to 0-5% | 0-1% to 0-100% |
| Accuracy | | $O_2$: ±0.75% measured value or ±0.05% $O_2$ | $O_2$: ±0.75% measured value or ±0.05% $O_2$; Combustibles: ±2% Full range | $O_2$: ±0.75% measured value or ±0.05% $O_2$; Combustibles: ±2% Full range; Methane: ±5% Full range | $O_2$: ±0.75% measured value or ±0.05% $O_2$ |
| Response time | | $O_2$: T90<6 Seconds | Comb: T90<30 Seconds | Hydrocarbons: T90<30 Seconds | $O_2$: T90<6 Seconds |
| Max. Flue gas temperature, probe material/length | | 704°C, 316SS/24"-108" 1024°C, 310SS/24"-108" 1649°C, Hexoloy™/24"-72" | 704°C, 316SS/24"-108" 1024°C, 310SS/24"-108" 1649°C, Hexoloy™/24"-72" | 704°C, 316SS/24"-108" 1024°C, 310SS/24"-108" 1649°C, Hexoloy™/24"-72" | 900°C, Hastelloy C |
| Analog output | | Two 0/4-20mA | Three 0/4-20mA | Four 0/4-20mA | Two 0/4-20mA |
| Communication | | RS-485 | RS-485 | RS-485 | RS-485 |
| Sensor | Enclosure | NEMA 4 | NEMA 4 | NEMA 4 | NEMA 4 |
| | Ambient temperature | -20~71°C | -20~71°C | -20~71°C | -20~60°C |
| | Explosion proof area | General purpose; Class 1, Division 2, Group A, B, C, D; Exd II C T3 | General purpose; Class 1, Division 2, Group A, B, C, D; Exd II C T3 | General purpose; Class 1, Division 2, Group A, B, C, D | Class 1, Division 1, Group B, D; EExd II C T6 (control unit) |
| Power | | Sensor: 115 VAC ±10%, 47-63 Hz, Max. 600 VA (650 VA floor mount); 230 VAC ±10%, 47-63 Hz, Max. 1850 VA (1900 VA floor mount); 2000 control unit: 95-230 VAC ±10%, 47-63 Hz, Max. 75 VA | | | |
| Control unit | | Series 2000 | Series 2000 | Series 2000 | Series 2000 |
| Sensor dimension H×W×D (mm) | | 660 × 260 × 254 | 660 × 260 × 254 | 660 × 260 × 254 | 495 × 515 × 230 |
| Main applications | | • Petrochemicals<br>• Chemicals<br>• Process furnaces | • Petrochemicals<br>• Chemicals<br>• Process furnaces | • Petrochemicals<br>• Chemicals<br>• Process furnaces | • CCR process<br>• Corrosive or high pressure processes |
| Features | | High precision and quick response | High precision and quick response | High precision and quick response | Specifically developed for CCR application |

* Above ambient temperature listed is for sensor. For 2000 control unit, ambient temperature is -10~50°C, Enclosure is NEMA 4, and 2000 control unit is UL Listed for NEC Class I, Division 2 areas.

| Model | | WDG-HPII | WDG-HPIIC | WDG-HPIICM |
|---|---|---|---|---|
| Installation/Sampling | | Close-coupled, convective | Close-coupled, convective | Close-coupled, convective |
| Components | | $O_2$ | $O_2$, Combustibles ($CO+H_2$) | $O_2$, Combustibles ($CO+H_2$), $CH_4$ |
| Display range | | $O_2$: 0-100% | $O_2$: 0-100%;<br>Combustibles: 0-10000ppm or 0-5% | $O_2$: 0-100%;<br>Combustibles: 0-10000ppm or 0-5%;<br>$CH_4$: 0-5% |
| Output range | | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100%<br>Combustibles: 0-2,000ppm to 0-10000ppm or 0-1% to 0-5% | $O_2$: 0-1% to 0-100%<br>Combustibles: 0-2000ppm to 0-10000ppm or 0-1% to 0-5%<br>$CH_4$: 0-2% to 0-5% |
| Accuracy | | $O_2$: ±0.75% measured value or ±0.05% $O_2$ | $O_2$: ±0.75% measured value or ±0.05% $O_2$;<br>Combustibles: ±2% Full range | $O_2$: ±0.75% measured value or ±0.05% $O_2$;<br>Combustibles: ±2% Full range;<br>Methane: ±5% Full range |
| Response time | | T63<16 Seconds | T63<16 Seconds | T63<16 Seconds |
| Max. Flue gas temperature, probe material/length | | 704°C, 316SS/24",36",48"<br>1024°C, 310SS/24",36",48"<br>1537°C, ceramic/24",36",48" | 704°C, 316SS/24",36",48"<br>1024°C, 310SS/24",36",48"<br>1537°C, ceramic/24",36",48" | 704°C, 316SS/24",36",48"<br>1024°C, 310SS/24",36",48"<br>1537°C, ceramic/24",36",48" |
| Analog output | | Two 0/4-20mA | Three 0/4-20mA | Three 0/4-20mA |
| Communication | | RS-485, RS-232 & HART® optional (IQ Links) | RS-485, RS-232 & HART® optional (IQ Links) | RS-485, RS-232 & HART® optional (IQ Links) |
| Sensor | Enclosure | NEMA 4 | NEMA 4 | NEMA 4 |
| | Ambient temperature | -20~71°C | -20~71°C | -20~65°C |
| | Explosion proof area | General purpose;<br>Class 1, Division 2, Group A, B, C, D;<br>Class 1, Division 1 Group B & D | General purpose;<br>Class 1, Division 2, Group A, B, C, D;<br>Class 1, Division 1 Group B & D | General purpose;<br>Class 1, Division 2, Group A, B, C, D |
| Power | | Sensor: 115 VAC ±10%, 47-63 Hz, Max. 600 VA (650 VA floor mount); 230 VAC ±10%, 47-63 Hz, Max. 1850 VA (1900 VA floor mount); 2000 control unit: 95-230 VAC ±10%, 47-63 Hz, Max. 75 VA | | |
| Control unit | | 2000 or IQ type | 2000 or IQ type | IQ type |
| Sensor dimension H×W×D (mm) | | 685 × 260 × 254 | 685 × 260 × 254 | 685 × 260 × 254 |
| Main applications | | • Waste incineration<br>• Kilns/furnaces<br>• Paper and pulp<br>• Wet stream scrubber<br>• Other high dust application | • Waste incineration<br>• Kilns/furnaces<br>• Paper and pulp<br>• Other high dust application | • Waste incineration<br>• Kilns/furnaces<br>• Paper and pulp<br>• Other high dust application |
| Features | | Suitable for high dust application | Suitable for high dust application | Suitable for high dust application |

* Above ambient temperature listed is for sensor. For 2000 control unit, ambient temperature is -10~50°C, Enclosure is NEMA 4, and 2000 control unit is UL Listed for NEC Class I, Division 2 areas.


| Model | | CEM/$O_2$ | SA/F IQ Air Demand Analyzer | PreMix 2000 Air/Fuel Ratio Analyzer | CMFA-P2000 |
|---|---|---|---|---|---|
| Installation/Sampling | | Extractive | Extractive, optional pump | Stationary, inside pump/ aspirator | Portable, inside pump/ aspirator |
| Components | | $O_2$ | $O_2$, A/F ratio, Wobbe | $O_2$, excess fuel, oxides/ fuels or fuels/oxides ratio | $O_2$, excess fuel, oxides/ fuels or fuels/oxides ratio |
| Display range | | $O_2$: 0-100% | $O_2$: 0-100% | $O_2$: 0-100%; Excess Fuel: 0-1 to 0-5% | $O_2$: 0-100%; Excess Fuel: 0-1 to 0-5% |
| Output range | | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100% | $O_2$: 0-1% to 0-100%; Excess Fuel: 0-1% to 0-5%; 5% Excess Oxygen to 5% Excess Fuel | $O_2$: 0-1% to 0-100%; Excess Fuel: 0-1% to 0-5%; 5% Excess Oxygen to 5% Excess Fuel |
| Accuracy | | $O_2$: ±0.75% measured value or ±0.05% $O_2$ | $O_2$: ±0.75% measured value or ±0.05% $O_2$ | $O_2$: ±2% measured value or ±0.1% $O_2$; Excess Fuel: ±5% value or ±0.25% Excess Fuel | $O_2$: ±2% measured value or ±0.1% $O_2$; Excess Fuel: ±5% measured value or ±0.25% Excess Fuel |
| Response time | | T90<4 Seconds (0.94 L/Minute) | T90: 25-35 Seconds (10:1 bypass flow) | $O_2$: T63<18 Seconds; Excess Fuel: T63<17 Seconds | $O_2$: T63<18 Seconds; Excess Fuel: T63<17 Seconds |
| Inlet pressure/flow rate | | Flow rate: 0.94-9.4L/ Minute | Inlet pressure: 34.5-689 kPa | Max. inlet pressure: 68.95 kPa; Flow rate: 1 L/Minute; Bypass: 50 L/Minute | Max. inlet pressure: 68.95 kPa; Flow rate: 1 L/Minute |
| Analog output | | Two 0/4-20mA | Three 0/4-20mA | Two 0/4-20mA | Two 0/4-20mA |
| Communication | | RS-485, RS-232 & HART® optional (IQ Links) | RS-485, RS-232 & HART® optional (IQ Links) | RS-485 | RS-485 |
| Sensor | Enclosure | Indoor | Indoor | NEMA 3R | — |
| | Ambient temperature | -18~50°C | -20~40°C | -20~70°C | -20~ 37.8°C |
| Power | | 115/230 VAC ±10%, 47-63 Hz, 1670 VA (sensor); 75 VA (control unit) | 115/230 VAC ±10%, 47-63 Hz | Sensor: 115 VAC ±10%, 50/60 Hz 1200 VA; 230 VAC ±10%, 50/60 Hz, 2400 VA; Control unit: 75 VA | 115 VAC ±10%, 50-60 Hz, 747 VA Max; 230 VAC ±10%, 50-60 Hz, 2222 VA Max. |
| Control unit | | 2000 or IQ type | IQ type | 2000 | 2000 |
| Sensor dimension H×W×D (mm) | | 325 × 305 × 155 | 610 × 610 × 230 | 445 × 305 × 235 | 273 × 457 × 407 |
| Main applications | | • CEM system | • Burners using variable composition fuel gas | • Glass forehearth<br>• Air/fuel mixtures<br>• Glass fiber apparatus<br>• Open flame brazing and soldering<br>• Tempering furnaces<br>• Gas generators<br>• Metals and metal forming | • Glass melting tanks<br>• Mix station tuning on forehearths<br>• Furnace atmosphere control<br>• Flame treating applications |
| Features | | Excess Fuel Software Option | Better process control from a direct measurement based upon a duplication of the combustion process | Measure air/fuel ratio in openflame applications where flue gas measurements are not practical | Two analyzers in one. Acts as a flue gas oxygen analyzer or a premix gas analyzer |

* Above ambient temperature listed is for sensor. For 2000 control unit, ambient temperature is -10~50°C, Enclosure is NEMA 4, and 2000 control unit is UL Listed for NEC Class I, Division 2 areas.


| Model | TM2000 | CG1000 | CG1000-RTP |
|---|---|---|---|
| Output range | $O_2$: 0.1ppm~100% | $O_2$: 0.1ppm~100% | $O_2$: 0.1 ppm~100% |
| Accuracy | ppm $O_2$ content: 2% reading or 0.5 ppm $O_2$ | ppm $O_2$ content: ±2% reading or 0.5 ppm $O_2$ | ±2% reading or 0.05% $O_2$ (for ppm content, 0.5 ppm $O_2$), whichever is greater |
| Response time | <5 Seconds (0.6 L/Minute)/decade | <5 Seconds (150 mL/Minute)/ decade | <5 Seconds (150 mL/Minute)/ decade |
| Sample gas pressure | 1.5-20 psig | 8.7-1035 Torr gauge, with pump | 600-810 Torr, with vacuum system/aspirator |
| Flow rate | 0.1-1 L/Minute | 150 mL/Minute | 150 mL/Minute |
| Flow measurement | N/A | Electronic flow sensor | Electronic flow sensor |
| Operation temperature | -18~50°C | 5~40°C | 5~40°C |
| Power | 115/230 VAC ±10%, 50/60 Hz, 288 VA | 115/230 VAC ±10%, 50/60 Hz, 150 VA | 115/230 VAC ±10%, 50/60 Hz, 80 VA |
| Calibration | Calibration gas: 0.6 L/Minute; Zero gas: 1ppm-10% $O_2/N_2$; Span gas: At least one decade above zero gas | Calibration gas: 150 mL/Minute; Zero gas: 1ppm-10% $O_2/N_2$; Span gas: At least one decade above zero gas | Calibration gas: 150 mL/Minute; Zero gas: 1ppm-10% $O_2/N_2$; Span gas: At least one decade above zero gas |
| Display | 4-line × 20-characters vacuum fluorescent display | 4-line × 20-characters vacuum fluorescent display | 4-line × 20-characters vacuum fluorescent display |
| Communication | RS-485 | RS-485 | RS-232, RS-485 (optional) |
| Options | Sample gas bypass | Built in pump | SS sampling system, vacuum system/aspirator, inert seal, leakage test 3×10-8 atm-cc/sec |
| Dimension H×W×D (mm) | 445 × 305 × 235 | 273 × 202 × 406 | 273 × 202 × 406 |
| Weight | 13.6 kg | 8.6 kg | 11.8 kg |
| Main applications | • Cryogenic gas generating systems<br>• Nitrogen purity systems<br>• Blanket gas analysis<br>• Inert gas purity<br>• Welding atmospheres<br>• Air separation<br>• Atmospheric oven control<br>• Glove box applications | • Cryogenic gas generating systems<br>• Nitrogen purity systems<br>• Blanket gas analysis<br>• Inert gas purity<br>• Welding applications<br>• Air separation<br>• Atmospheric oven control<br>• Glove box applications<br>• Semiconductor manufacturing<br>• Oxidation/anneal thermal process furnaces | • Rapid Thermal Processing (RTP)<br>• Fast ramp mini-batch furnaces |
| Features | Quickly responds to process change; Can detect excess combustibles process upsets with very low ppm oxygen readings | Portable, Quickly responds to net oxygen changes from 0.1 ppm to 100% $O_2$ | Fast response over a wide operating range; Specifically developed for RTP process |




| Model | CG1100 | CG1100-RTP | CG1100-GS |
|---|---|---|---|
| Output range | $O_2$: 0.1 ppm-100% | $O_2$: 0.1 ppm-100% | $O_2$: 0.1 ppm-100% |
| Accuracy | ±2% of reading or 0.05% $O_2$ absolute (0.5 ppm $O_2$ absolute for ppm range), whichever is greater | ±2% of reading or 0.05% $O_2$ absolute (0.5 ppm $O_2$ absolute for ppm range), whichever is greater | ±2% of reading or 0.05% $O_2$ absolute (0.5 ppm $O_2$ absolute for ppm range), whichever is greater |
| Response time | <5 Seconds (150 mL/Minute) | <5 Seconds (150 mL/Minute) | <5 Seconds (150 mL/Minute) |
| Sample gas pressure | 600~1795 Torr | 600~1034 Torr | 5~10 psig<br>25~120 psig |
| Flow rate | 150 mL/Minute | 50~200 mL/Minute, (calibration flow rate 100 mL/Minute) | Controlled at 150 mL/Minute |
| Flow measurement | Electronic flowmeter | Electronic flowmeter | Mechanical flowmeter |
| Operation temperature | 0~40°C | 0~40°C | 0~40°C |
| Power | 100-250 VAC, 47-63 Hz, 60 VA | 100-250 VAC, 47-63 Hz, 60 VA | 100-250 VAC, 47-63 Hz, 60 VA |
| Calibration gas | Calibration gas: 150 mL/Minute;<br>Zero gas: 1ppm~10% $O_2/N_2$;<br>Span gas: At least one decade above zero gas | Calibration gas: 150 mL/Minute;<br>Zero gas: 1ppm~10% $O_2$ /$N_2$;<br>Span gas: At least one decade above zero gas | Calibration gas: 150 mL/Minute;<br>Zero gas: 1ppm~10% $O_2/N_2$;<br>Span gas: At least one decade above zero gas |
| Communication | RS-232, 2 × RS-485 | RS-232, 2 × RS-485 | RS-232, 2 × RS-485 |
| Others | Options: Vacuum generator (aspirator), 2000 system software | Features: SS sampling system, Inert seal for measuring cell, leakage test 3×10-8 atm-cc/sec, inlet and outlet shut off valves, Optional 2000 system software | Options: Remote calibration unit, 2000 system software |
| Dimension<br>H×W×D (mm) | 203 × 203 × 203 | 203 × 203 × 203 | 203 × 203 × 203 |
| Weight | 3.7 kg | 5.0 kg | 3.7 kg |
| Main applications | • Oven/Furnace Atmospheres<br>• Blanket/Purge Gases<br>• Welding Gases<br>• Food Packaging<br>• Component Aging Chambers<br>• Carbon Dioxide Purity<br>• Nitrogen Purity | • Rapid Thermal Processing (RTP)<br>• Fast ramp mini-batch furnaces | • Air Separation<br>• Blanket /Purge Gases<br>• Welding Atmospheres<br>• Food Packaging<br>• Glove Box Applications<br>• Inert Gas Purity<br>• Nitrogen Purity<br>• Oven/Furnace atmospheres |
| Features | Fast response over a wide operating range: $O_2$ 0.1ppm-100% | Fast response over a wide operating range: Specifically developed for RTP process | Fast response over a wide operating range: $O_2$ 0.1ppm-100% |