

## ATEX II 3 G WDG-HPII Series

Convective analyzers for measurement of oxygen and combustibles in flue gas streams up to 1537°C.

The WDG-HPII series analyzers mount directly on the combustion process and are designed for direct measurement in flue gas applications containing high levels of particulate. These analyzers are suitable for gas streams up to 704°C using the standard 316SS probe/filter assembly. Flue gas temperatures up to 1537°C 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 with separate control unit (Series 2000) or integral on-board electronics (IQ versions) and are offered in a range of mounting styles. An optional combustibles detector is available for optimal control of the combustion process.



### ATEX II 3 G MODELS

SERIES 2000 BASED	SMART SENSOR VERSIONS
WDG-HPII Oxygen	WDG HPII/IQ Oxygen
WDG-HPIIC Oxygen & Combustibles	WDG HPIIC/IQ Oxygen & Combustibles

### SENSOR SECTION

**Principle of Operation:** Zirconium oxide for net oxygen measurement and hot-wire type catalytic detector for combustibles.

**Output Range:**

Oxygen: From 0-1 to 0-100%  
 Combustibles: From 0-2,000 ppm to 0-10,000 ppm or from 0 - 2% to 0 - 5%.

**Accuracy:**

Oxygen: ±0.75% of measured value or ±0.05% O<sub>2</sub>, whichever is greater  
 Combustibles: ±2% of full scale output range

**Response:**

Oxygen: 90% of a step change < 30 seconds with 24" probe

**Max. Flue Gas Temp. / Probe Material:**

704°C / 316 SS  
 1024°C / 310 SS  
 1537°C / Ceramic

**Probe Lengths:**

SS: 61 cm, 91 cm, 122 cm  
 Ceramic: 61 cm, 91 cm, 122 cm

**Max. Sample Dewpoint:** 200°C

**Sample Pressure:** Subatmospheric  
**Purge Flow During Rapid Exchange Period:** 340 L/min.

**Purge Flow During Normal Operation:** 30.2 L/min.

**Environment:**

Ambient Temp.: -20°C to 60°C  
 Relative Humidity: 10% to 90%, non-condensing

**Enclosure:** NEMA 4X (IP65) hinged stainless steel wall mount.

**Calibration Gas Requirements:**

Use calibration gases at 0.70 kg/cm<sup>2</sup>, 0.7 L/min.  
 O<sub>2</sub> Span Gas: Air or from 1.0% to 100% O<sub>2</sub>, balance N<sub>2</sub>  
 O<sub>2</sub>, Comb. Zero Gas: From 0.1 to 10% O<sub>2</sub> (2% recommended), balance N<sub>2</sub>  
 Comb. Span Gas: 800 ppm CO, 800 ppm H<sub>2</sub>, 2 to 4% O<sub>2</sub>, balance N<sub>2</sub> (for a 0 - 2000 ppm combustibles range)

**SYSTEM COMPLIANCE:**

EMC Compliance: 2004/108/EC  
 Electronics Safety Compliance: 73/23/EEC  
 ATEX Directive 94/9/EC

**TYPE APPROVAL (LCIE 05 ATEX 6140 X and LCIE 05 ATEX 6140 X / 01)**

Hand Held IQ Link	ⓂII 3 G EEx nL IIC T4	-20°C ≤ Ta ≤ 70°C
Wall Mount IQ Link	ⓂII 3 G EEx nA IIC T4	-20°C ≤ Ta ≤ 70°C
Series 2000 Control Unit	ⓂII 3 G EEx nA IIC T3	-10°C ≤ Ta ≤ 50°C
WDG...	ⓂII 3 G EEx nZ IIC T3	-20°C ≤ Ta ≤ 60°C

## INTERFACE OPTIONS

The choice of smart sensors or discrete sensor and control unit combinations offers flexibility to suit application and site requirements.

IQ analyzers incorporate all the necessary intelligence for operation and to provide analog outputs and alarms directly from the sensor. User access is via a handheld or wall mount IQ Link™ communicator. For installations where a separate control unit is preferred, the Series 2000 can be located up to 304m from the sensor.

### SERIES 2000 CONTROL UNIT

**Display:** Four-line x 20-character vacuum fluorescent.

**Analog Output:** Two isolated linear current outputs. One additional output for combustibles (optional).

**Alarms:** Two independent oxygen alarms, each high or low selectable. Two high combustibles alarms (optional). One loss of purge alarm (on Sensor) .

**Environment:**

Ambient Temp.: -10°C to 50°C

Humidity: 10% to 80%, non-condensing

**Communications:** RS-485, 2-way addressable.

**Enclosure:** Weatherproof NEMA 4 (IP 56). NEMA 4X (IP 56) stainless steel available as option.

### COMMON FEATURES

**Display:** Selectable displays with password protection, programmable pressure compensation and context-sensitive help.

**Alarms:** One alarm can be assigned as oxygen, in calibrate or in verify. Set relays to energize or de-energize on alarm. SPST type. Contact rating 0.5A, 30V, 10VA max. noninductive load, AC or DC.

**Calibration:** Oxygen cell lifetime extender. Calibrate or verify calibration. Store last calibration and verification data. Selectable calibration gas run time and process recovery time.



Handheld IQ Link and Wall Mount IQ Link



Series 2000 Control Units

**Diagnostics:** Watchdog timer and service alarms. System test for A/D, RAM, EEPROM, and keypad. Display line 4 reserved for full text error and diagnostic messages. Twenty-entry event log.

**Analog Output:** Each output can be 4-20 mA or 0-20 mA and is fully scalable. Hold or track during calibration and select degree of damping.

### IQ VERSIONS

Handheld or dedicated wall mount IQ Links provide a local interface to the ThermoX line of Smart Sensors using RS-232 communications. The IQ links are used to set up and display system parameters, initiate calibrations, and perform system tests and troubleshooting. The handheld link can be plugged into any ThermoX IQ Analyzer. The dedicated wall mount version is hard wired to a specific analyzer but can

be easily rewired depending on plant needs. With optional HART® protocol, a universal controller can be used in lieu of or in addition to the IQ Links. Device descriptions are registered with the HART foundation.

**Interface:**

Handheld: RS-232 plug in 213 cm cable, general purpose enclosure.

Wall Mount: RS-232, max. distance 1524 cm, NEMA 4X (IP65) enclosure.

**Environment:**

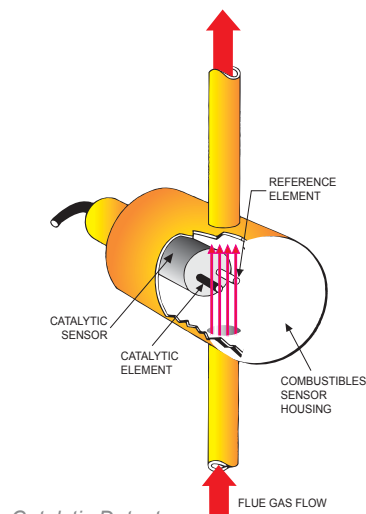
Operating Temp.: -20°C to 70°C

Humidity: 5% to 80% (non-condensing)

**Display:** Four-line by 20-character LCD  
**Analog Output:** One isolated linear output. One additional output for combustibles (optional). Max. load 1000 ohms.

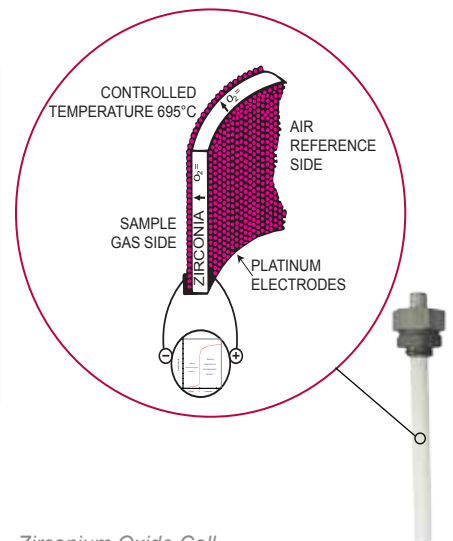
**Alarms:** One dry contact alarm. One additional alarm for combustibles (optional) . One loss of purge alarm (on Sensor).

**Communications:** RS-485, 2-way addressable or HART.



Catalytic Detector

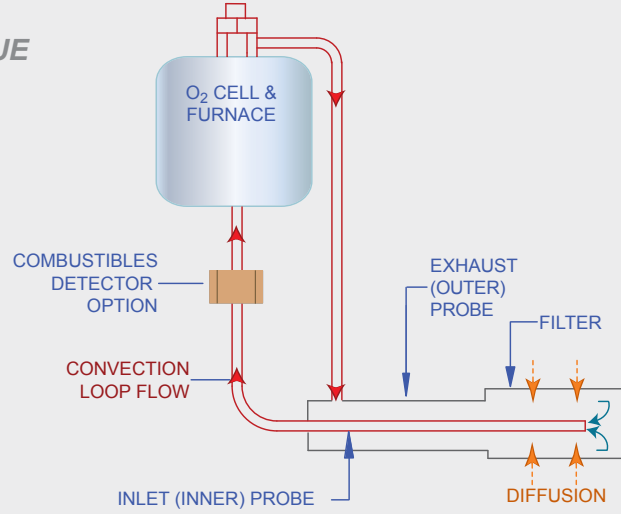
**RELIABLE AND EASY TO SERVICE**  
 All models use zirconium oxide for net oxygen measurement and catalytic detectors for combustibles. The sample path is through large internal diameter tubing with no restrictions allowing unobstructed sample flow through the analyzer. The oxygen cell and catalytic detectors are designed for long life in demanding applications. All parts are easy to reach and can be replaced using standard tools without having to remove the analyzer from the flange.



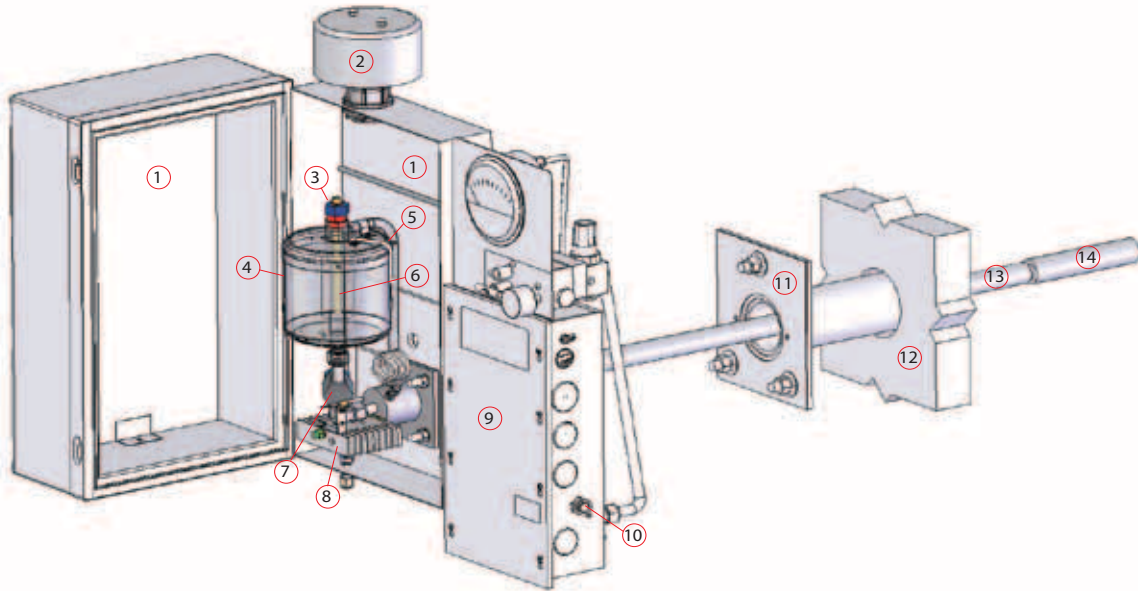
Zirconium Oxide Cell

### CLOSE-COUPLED CONVECTIVE TECHNIQUE

Case heaters maintain the internal sample wetted parts above the acid dew point of the sample. Flue gas diffuses through a large filter at the end of the probe which acts as a sample chamber. A convection loop contains the zirconium oxide oxygen cell. Due to the natural convection generated by the temperature difference between the cell location (695°C) and the return leg (approximately 215°C), a portion of the filter contents is drawn into the convection loop, past the combustibles detector and oxygen cell then back to the filter. The controlled conditions of the convection loop are ideally suited to the catalytic combustibles detector which benefits from a constant temperature and constant flow environment.



### SENSOR DETAILS



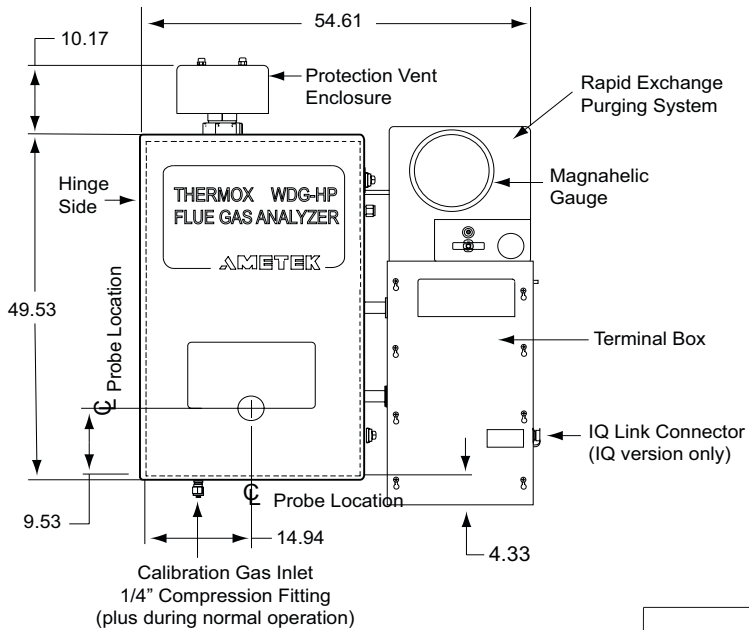
- 1 Insulated SS Enclosure
- 2 Vent
- 3 Oxygen Cell (zirconia)
- 4 Furnace (cell heater)
- 5 Thermocouple
- 6 Cell Housing
- 7 Combustibles Detector (option)

- 8 Case Heater
- 9 Purge Enclosure and Terminal Box
- 10 Plug-in Connector (IQ only)
- 11 Flange or Mounting Plate
- 12 Process Wall
- 13 Sample Probe
- 14 Probe Filter

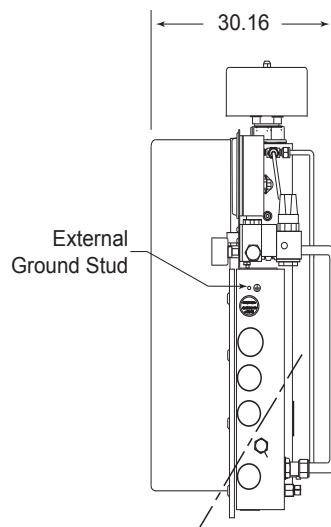
# ATEX II 3 WDG-HP II SERIES

## WALL MOUNT SENSOR (STANDARD MOUNT)

APPROX WEIGHT: 31.75 KG

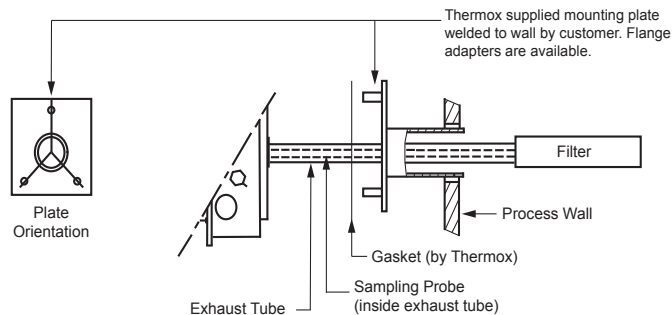
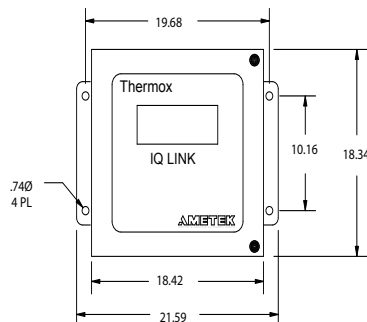


DIMENSIONS IN CENTIMETERS



## WALL MOUNT IQ LINK

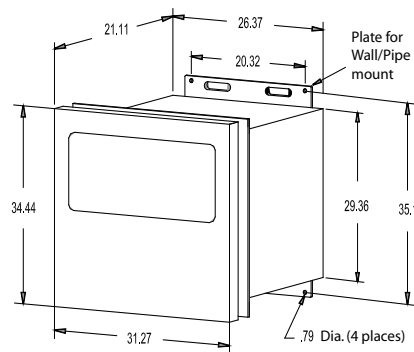
APPROX WEIGHT: 4.53 KG



## SERIES 2000 CONTROL UNIT

NEMA 4 / NEMA 4X (CUTOUT: 31.18 cm H X 27.31 cm W)

APPROX WEIGHT: 12.7 KG



MODEL	POWER REQUIREMENTS
WDG-HP II, WDG-HP IIC	104-127 / 207-253 Vac, 700 / 1950 VA
WDG-HP II/IQ, WDG-HP IIC/IQ	104-127 / 207-253 Vac, 750 / 1990 VA
Hand-Held IQ Link	9 - 15 Vdc, 0.1 A
Wall Mount IQ Link	104 - 253 Vac, 8 VA
Series 2000 Control Unit	104 - 253 Vac, 30 VA

NOTE: 1. All static performance characteristics are with operating variables constant. 2. System accuracy referenced to 0.1 to 10% calibrated range. 3. Response is to calibration gas.

**AMETEK®**  
PROCESS INSTRUMENTS

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