

THE RIGHT ANALYZER FOR *YOUR* APPLICATION!

## ATEX II 3 G (Zone 2) 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 1649°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 (ZONE 2) MODELS

#### SERIES 2000 BASED

WDG-HPII Oxygen

WDG-HPIIC Oxygen and Combustibles

#### SMART SENSOR VERSIONS

WDG HPII/IQ Oxygen

WDG HPIIC/IQ Oxygen and 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:  $\pm 0.75\%$  of measured value or  $\pm 0.05\% O_2$ , whichever is greater

Combustibles:  $\pm 2\%$  of full scale output range

#### Response:

Oxygen: 63% of a step change < 30 secs.

Combustibles: 63% of a step change < 30 secs.

#### Max. Flue Gas Temp. / Probe Material / Lengths:

704°C / 316 SS / 61 cm, 91 cm, 122 cm

1024°C / RA330 / 61 cm, 91 cm, 122 cm

1648°C / Ceramic / 61 cm, 91 cm, 122 cm

#### Max. Sample Dewpoint: 232°C

#### Sample Pressure:

$\pm 0.14 \text{ kg/cm}^2$ : no adjustments required

$\pm 0.14 \text{ kg/cm}^2$  to  $\pm 0.63 \text{ kg/cm}^2$ : software selectable

$\pm 0.70 \text{ kg/cm}^2$  and above: consult factory

**Purge Air:** Max. 340 L/min. (Rapid Exchange Purge System)

#### Environment:

Ambient Temp.: -20°C to 60°C

Relative Humidity: 10% to 90%, non-condensing

**Enclosure:** NEMA 4X (IP56) 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: 89/336/EEC

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 1 A, 30V max. non inductive 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.



NEMA 4  
Series 2000  
Control Unit



NEMA 4X  
Series 2000 Control  
Unit (Stainless Steel)



Handheld IQ Link and Wall Mount IQ Link

**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 Thermax 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 Thermax 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 (IP56) enclosure.

**Environment:**

Operating Temp.: -20°C to 70°C

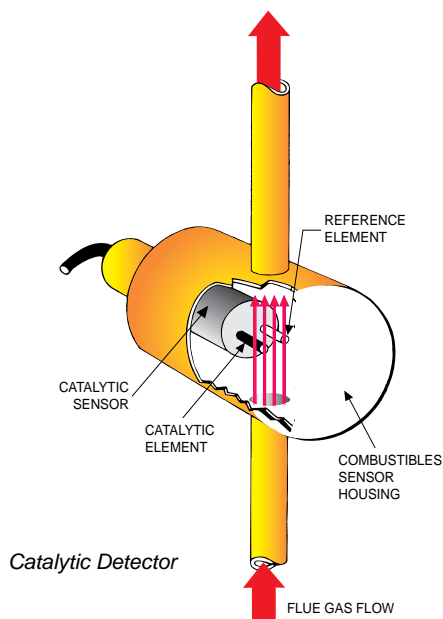
Humidity: 5% to 80% (non-condensing)

**Display:** Four-line by 20-character LCD

**Analog Output:** One isolated linear output. One additional output for combustibles (optional). Max. load 1000 ohms.

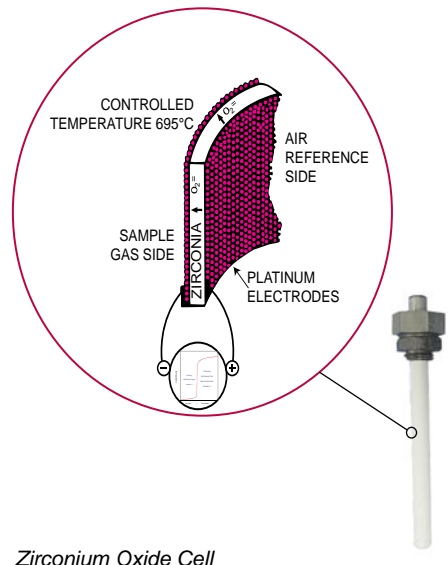
**Alarms:** One dry contact alarm. One additional alarm for combustibles (optional). One loss of purge alarm (on Sensor).

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



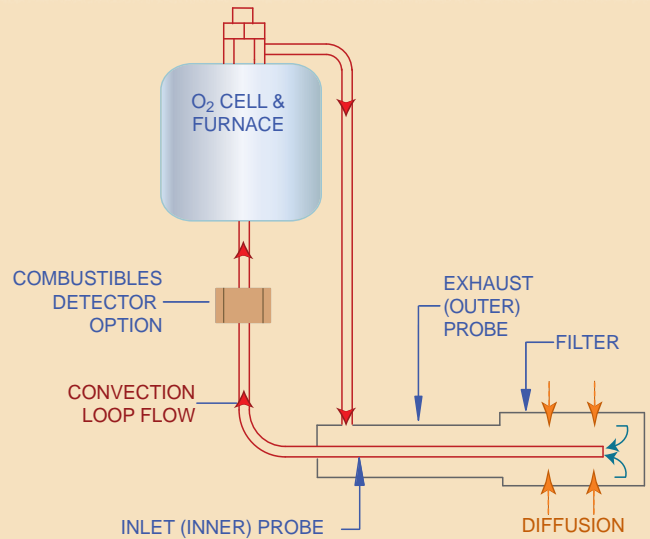
### RELIABLE AND EASY TO SERVICE

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.

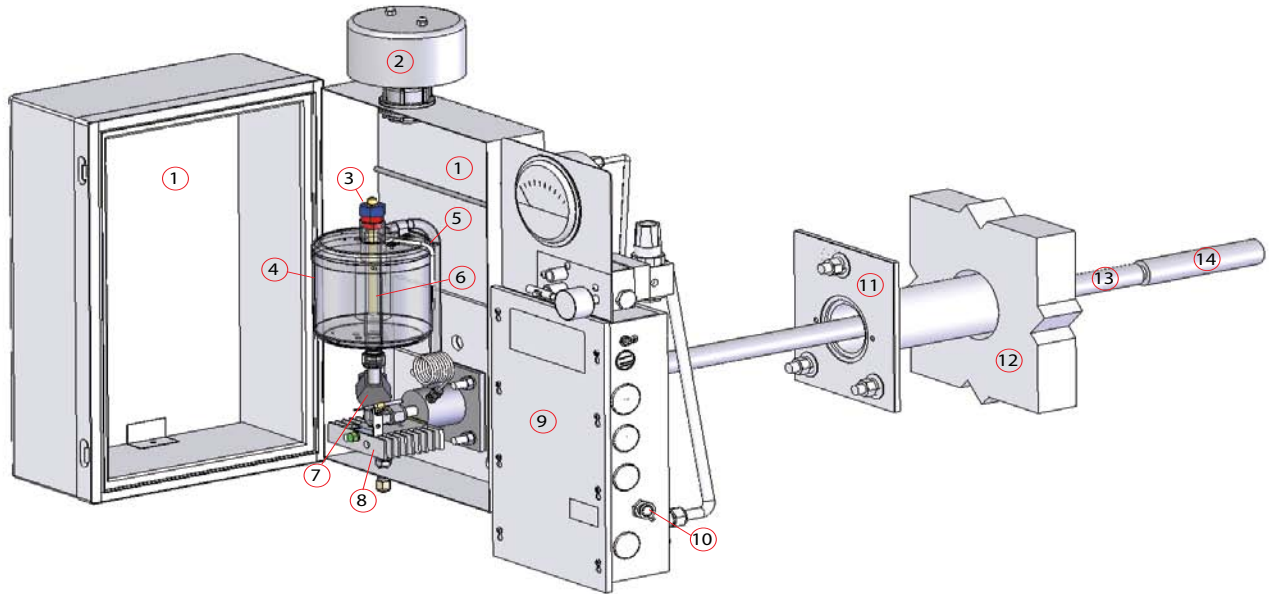


## CLOSE-COUPLED CONVECTIVE TECHNIQUE

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)

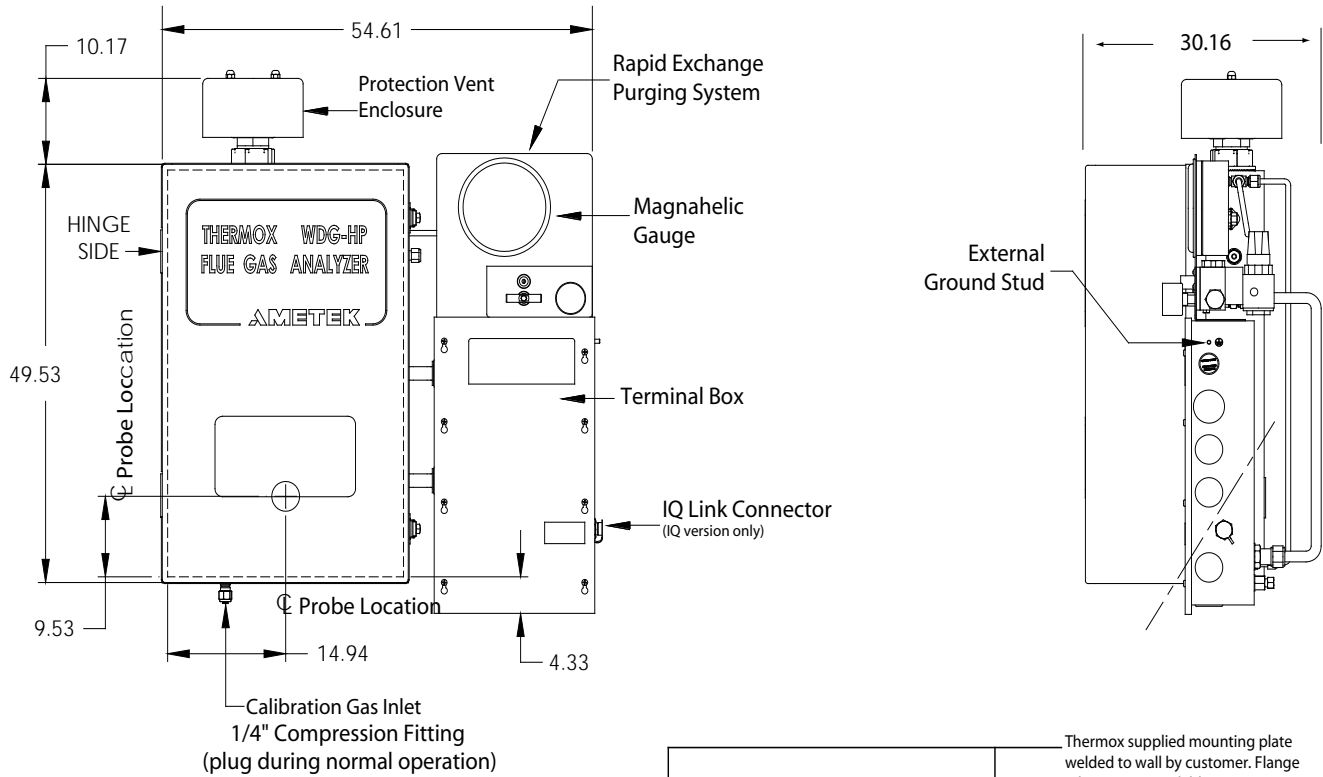
- 8 Case Heater
- 9 Purge Enclosure and Terminal Box
- 10 Plug-in Connector (IQ only)
- 11 Flange or Mounting Plate
- 12 Process Wall
- 13 Sample Probe
- 14 Probe Filter

# WALL MOUNT SENSOR

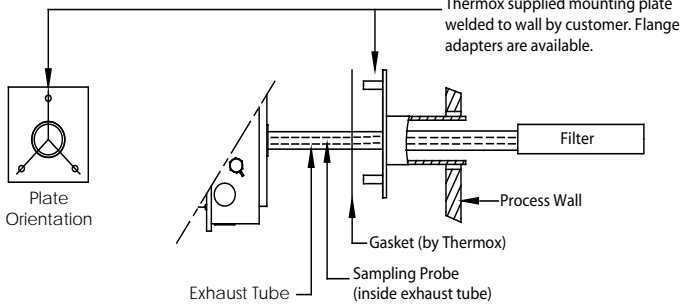
(STANDARD MOUNT)

APPROX WEIGHT: 31.75 KG

DIMENSIONS IN CENTIMETERS



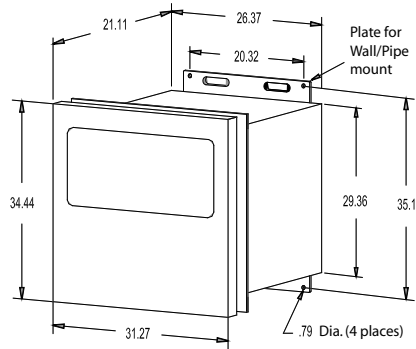
MODEL	POWER REQUIREMENTS
WDG-HPII, WDG-HPIIC	104-127 / 207-253 Vac, 700 / 1950 VA
WDG HPII/IQ, WDG HPIIC/IQ	104-127 / 207-253 Vac, 750 / 1990 VA
Hand-Held IQ Link	9 - 15 Vdc, 0.1 A
Wall Mount IQ Link	104 - 253 Vac, 8 VA
Series 2000 Control Unit	104 - 253 Vac, 30 VA



## SERIES 2000 CONTROL UNIT

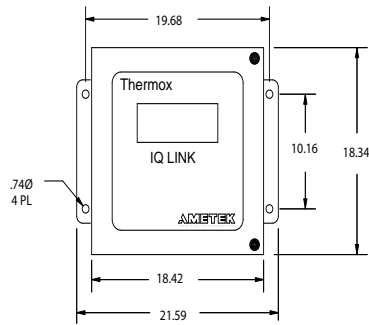
NEMA 4 / NEMA 4X (CUTOUT: 31.18 cm H X 27.31 cm W)

APPROX WEIGHT: 12.7 KG



## WALL MOUNT IQ LINK

APPROX WEIGHT: 4.53 KG



NOTE: All static performance characteristics are with operating variables constant. System accuracy referenced to 0.1 to 10% calibrated range.

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

USA - Pennsylvania  
150 Freeport Road  
Pittsburgh, PA 15238  
Ph. 412-828-9040  
Fax 412-826-0399

MANUFACTURING  
LOCATIONS



CANADA  
2876 Sunridge Way N.E.  
Calgary, AB T1Y 7H9  
Ph. 403-235-8400  
Fax 403-248-3550

USA - Delaware  
455 Corporate Blvd.  
Newark, DE 19702  
Ph. 302-456-4400  
Fax 302-456-4444

USA - Oklahoma  
2001 N. Indianwood Ave.  
Broken Arrow, OK 74012  
Ph. 918-250-7200  
Fax 918-459-0165

**AMETEK**  
Process Instruments

www.thermax.com

© 2006, by AMETEK, Inc. All rights reserved.  
P710 (06/06 pdf)



SUPPORT LOCATIONS

USA - Texas • Ph. 281-463-2820 • Fax 281-463-2701  
CHINA - Beijing • Ph. 86-10-85262111 • Fax 86-10-85262141  
Chengdu • Ph. 86-28-86758111 • Fax 86-28-86758141  
Shanghai • Ph. 86 21 6426 7049 • Fax 86 21 6426 7054  
FRANCE • Ph. 33 1 30 68 89 00 • Fax 33 1 30 68 89 99  
GERMANY • Ph. 49 21 59 91 36 0 • Fax 49 21 59 91 3680  
MIDDLE EAST - Dubai • Ph. 971-4-881 2052 • Fax 971-4-881 2053  
SINGAPORE • Ph. 65-6484-2388 • Fax 65-6481-6588