

# WDG-INSITU

## Flue Gas Oxygen Analyzer

# Thermax®

The right analyzer for your application

### SERIES 2000 CONTROL UNIT

#### Display:

Four line x 20 character vacuum fluorescent. Displays combinations of oxygen, time and date, cell temperature, user-programmable text, thermocouple mV or cell mV. Password protection, programmable pressure compensation and context sensitive help are also provided.

#### Recorder Output:

Two isolated linear current outputs. Select O<sub>2</sub>, cell temperature, thermocouple mV or cell mV. Each output can be 4-20 mA, 0-20 mA, 20-4 mA or 20-0 mA and is fully scalable. Hold or track during calibration and select degree of damping. Maximum load 1200 ohms.

#### Alarms:

Two independent oxygen alarms, each high- or low-selectable. One alarm can be assigned as oxygen, calibrate or verify. Set relays to energize or de-energize on alarm. Contact rating max. 30VA, 30V max. non-inductive load.

#### 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.

#### Communications:

RS-485 2-way addressable.

#### Environment:

Ambient Temp.: 14°F to 140°F (-10°C to 60°C)  
(See Note 1)

Relative Humidity: 10% to 80%, non-condensing

#### System Compliance:

EMC Directive 89/336/EEC

- Immunity Standard, EN 50082-2, Heavy Industrial
- Emissions Standard, EN 55011,  
Equipment Class: Industrial, Scientific, and Medical
- Low Voltage Directive 73/23/EEC
- Safety requirement for electrical equipment for measurement, control and laboratory use, EN 61010-1 (IEC 1010-1)

#### Enclosure:

Choice of general purpose wall mount, general purpose 19" rack mount, general purpose panel mount, weatherproof NEMA 4 wall/panel mount, and stainless steel weatherproof NEMA 4X wall/panel mount. All are UL Listed for NEC Class I, Division 2 areas. Purged and explosion-proof versions also available.

#### Calibration:

Oxygen cell lifetime extender. Calibrate or verify calibration. Store last calibration and verification data. Selectable calibration gas run time and process recovery time. Timed automatic calibration with optional Remote Calibration Unit.

#### Power Requirements:

Nominal 95-230 VAC, ± 10%, 47-63 Hz.

#### Power Dissipation:

75 VA max.



### SENSOR

#### Principle of Operation:

Direct sensing insitu probe using a zirconium oxide electrochemical cell for oxygen measurement. Completely field serviceable.

#### Display Range:

Oxygen: 0.1-100%

#### Output Range:

Oxygen: From 0-1% to 0-100%

#### Accuracy:

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

#### Response:

< 3 secs. to calibration gas. 63% of a process step change < 20 secs.

#### Drift:

< 0.1% of cell output per month (< 0.005% O<sub>2</sub> per month with 2% O<sub>2</sub> applied)

#### Linearity:

± 1% of output span

#### Repeatability:

± 1% of output span

#### Flue Gas Temperature:

To 1250° F (677°C). Outer probe material is RA330.

#### Sample Pressure:

± 2 psig; no adjustments required.  
± 2 to ± 9 psig; software selectable  
± 10 psig and above; consult factory.

#### Environment:

Ambient Temp.: -5°F to 160°F (-20°C to 71°C)  
Relative Humidity: 10% to 90%, non-condensing

#### Enclosure:

NEMA 4X Standard. Explosion-proof and purged versions are optional.

#### Power Requirements:

115 VAC, ± 10%, 47-63 Hz.;  
230 VAC, ± 10%, 47-63 Hz.

#### Power Dissipation:

150 VA max.

#### Calibration Gas Requirements:

Use all calibration gases @ 10 psig, 3 to 6 scfh (0.70 kg/cm<sup>2</sup>, 1.41 to 2.82 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> Zero Gas:

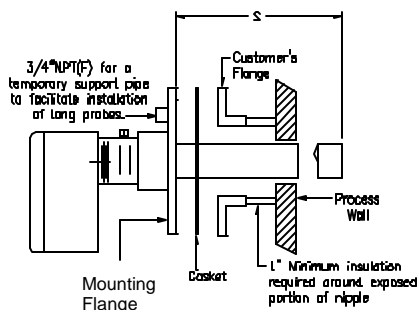
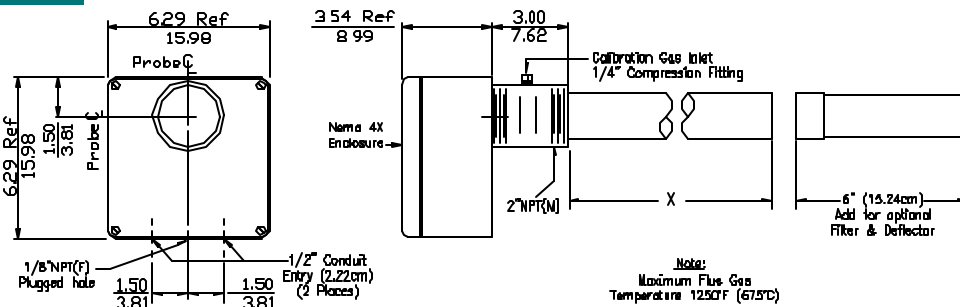
2% or from 0.1 to 10% O<sub>2</sub>, balance N<sub>2</sub>

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## SENSOR

INCHES  
CM

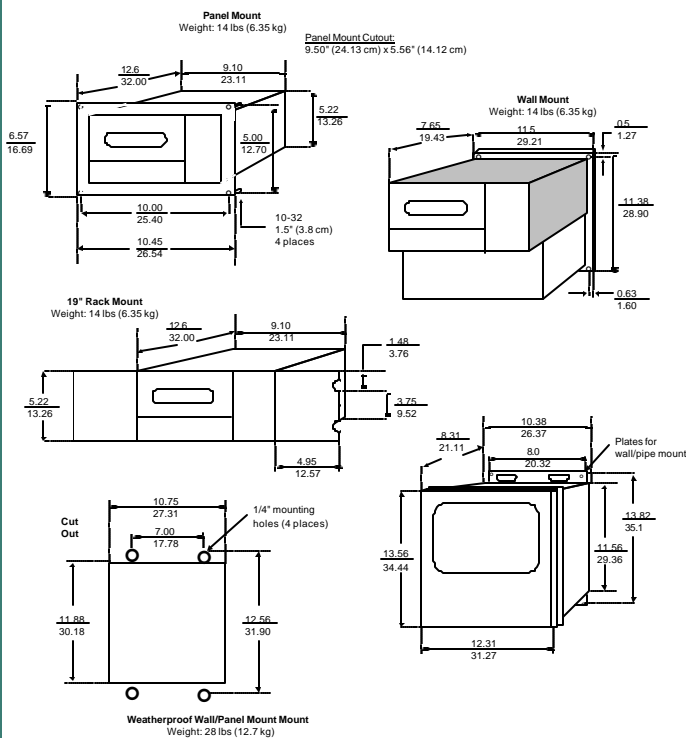


Probe Model	X Inches (cm)	S Inches (cm)	Weight Lb. (kg)
9"	8.75 (22.2)	7.0 (17.8)	9 (4.1)
18"	17.75 (45.1)	16.0 (40.6)	15 (6.8)
36"	38.75 (98.4)	37.0 (94.0)	30 (13.6)
72"	74.75 (189.9)	73.0 (185.4)	50 (22.7)
108"	110.75 (281.3)	109.0 (276.8)	70 (31.8)

- Standard Thermox mounting flanges, 3"-300# and 4"-150#.  
Other configurations are available upon request.
- 108" probe must be supported externally by customer.

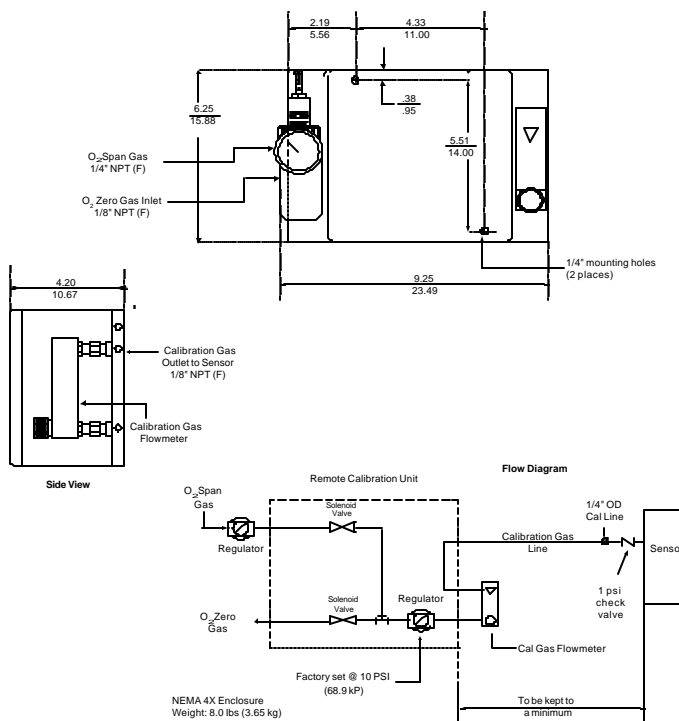
## CONTROL UNIT

INCHES  
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## REMOTE CALIBRATION UNIT

INCHES  
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### Notes:

1. Controller with purge air or vortex cooler option installed.
2. All static performance characteristics are with operating variables constant.
3. System accuracy referenced to 0.1 to 10% calibrated range.