

## ■ User-friendly

- language options
- selectable system analysis
- comprehensive diagnostics
- includes reference air supply

## ■ Reliable

- steel enclosure
- NEMA 4X/IP66
- proven track record



**Superior technology and  
quality from the world  
leader in oxygen  
measurement**

**Introduction**

The ZDT Analyzer/Alarm Unit is a versatile microprocessor-based oxygen analyzer designed to meet the requirements of high-temperature combustion control applications, utilizing high-quality zirconia oxygen probes, for energy management.

The high temperature version of the ZDT Unit is designed to operate with the ZGP2 oxygen probe – see separate data sheet SS/ZGP2.

In the event of probe thermocouple failure the temperature of the process can be preset in the ZDT Unit.

The standard analyzer has high/low alarm relays and a single linear or logarithmic isolated retransmission. Display features include %O<sub>2</sub>, cell temperature, cell mV, alarm set points, calibration sequence diagnostics and output settings.

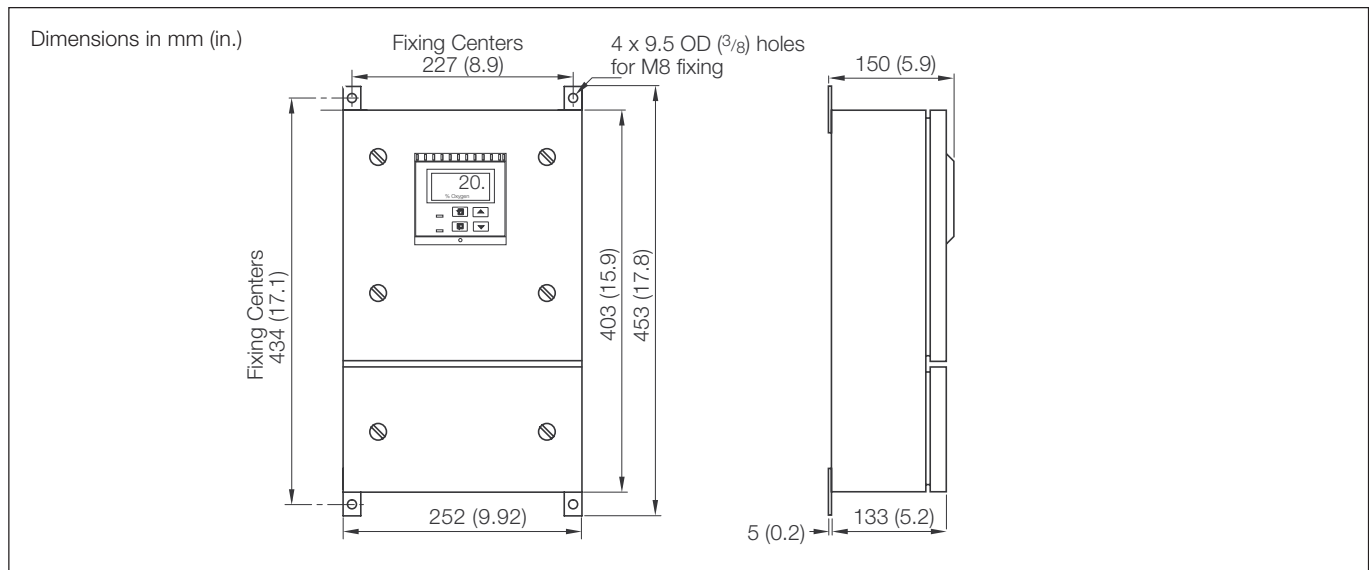
The analyzer provides oxygen readout with computation based on the probe mV signal. The mV output signal is Nernstian in form and follows the equation:

$$E(mV) = 0.0496 T \left( \log_{10} \frac{P_0}{P_1} \right) \pm C (mV)$$

- Where: T = Absolute temperature (°K)
- P<sub>0</sub> = Partial pressure reference O<sub>2</sub> (air)
- P<sub>1</sub> = Partial pressure sample O<sub>2</sub>
- C = Cell constant
- 0.0496 = Faraday's Gas Constant

Reference air for the ZGP2 probe can be supplied by an optional integral pump within the ZDT, or by external regulated instrument air. Flow rate of the integral pump is approximately 1lmin<sup>-1</sup> (0.264 galls min<sup>-1</sup>).

**Overall Dimensions – Analyzer**



**Construction and Operation**

The ZDT Unit is housed in a sheet steel enclosure, environmentally protected to NEMA 4X (IP66).

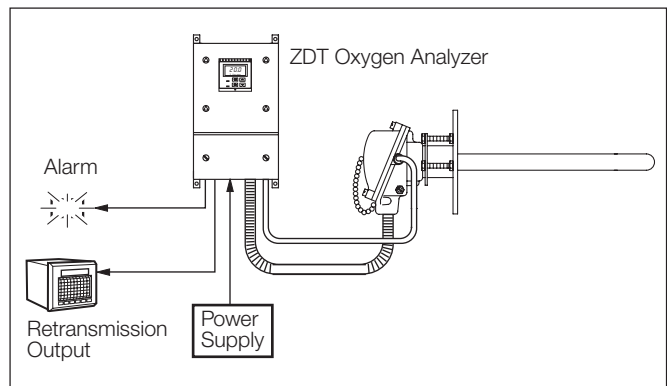
The analyzer is based on the proven 4600 Series transmitter with a two-line display and four tactile membrane switches. The measured value display-line is a 5-digit, 7-segment green back-lit LCD while the information display-line is a 16-character, single-line, dot-matrix, green back-lit LCD.

The information display can be user-programmed for display in English, French, German or Spanish language.

The switch enables movement from the 'Operating Page' to the oxygen calibration sequence. Use of the appropriate security code allows further access to the pages for 'Set Up Outputs' and 'Electrical Calibration'. The switch is used to select the various programming pages while the and switches change programmable values.

In the Oxygen Calibration Page a User Code is required to proceed beyond the diagnostic information to the calibration sections.

**Schematic Diagram**



## Specification – Analyzer

### Display

#### Measured value

5-digit x 7-segment back-lit LCD

#### Information

16-character, single line, dot matrix, back-lit LCD

#### Parameters

%O<sub>2</sub> (0 to 25%)

Cell temperature

Cell mV

Two O<sub>2</sub> alarm set points – alarm 2 can be configured as a common failure alarm for any of the following:

THC open circuit

Cell under temperature

Calibration failed

Power failure

### Accuracies

#### System accuracy \*

#### Display resolution

±1 digit

#### Display

≤2% of reading

or ±0.1 O<sub>2</sub> whichever is greater

#### Retransmission

≤± 2% of reading

or ±0.1% O<sub>2</sub> whichever is greater

#### Error due to power supply variation

Less than 0.1% for +6% –20% variation from nominal supply voltage

\* ZDT Unit with a ZGP2 probe when calibrated against a certified test gas

### Environmental Data

#### Operating temperature limits

–5° to 55°C (23° to 131°F) all functions

–20° to 70°C (–4° to 158°F) retransmission

#### Storage temperature limits

–25° to 55°C (–13° to 131°F)

#### Operating humidity limits

Upto 95% RH non-condensing

### Power Supply

#### Voltage requirements

100 to 130V, 200 to 260V 50/60Hz

#### Power consumption

110VA

#### Insulation

Mains to earth (line to ground) 2kV RMS

### Outputs and Set Points

#### No. of relays

Two

#### Relay contacts

Single pole changeover

Rating 250V AC 250V DC max.

3A AC 3A DC max.

Loading (non-inductive) 750VA 30W max.

(inductive) 75VA 3W max.

#### Insulation

2kV RMS contacts to earth (ground).

#### No. of set points

Two

#### Set point adjustment

Programmable.

#### Set point hysteresis

±1% of set point (fixed)

#### Local set point annunciation

Red LED

### Retransmission

One fully isolated retransmission

Programmable for any range within

0 to 25% O<sub>2</sub> (linear)

(5% minimum span)

0.01 to 25% O<sub>2</sub> (logarithmic)

(Programmable for any two decades within 0.01 to 25%)

#### Output current

0 to 10mA, 0 to 20mA or 4 to 20mA programmable

#### Resolution

0.1% at 10mA, 0.05% at 20mA

#### Max. load resistance

750Ω (20mA max.)

#### Output loop test

Output loop test at 0%, 25%, 50%, 75% and 100% of output span

### Mechanical Data

#### Mounting

Wall-mount

#### Protection

NEMA 4X (IP66)

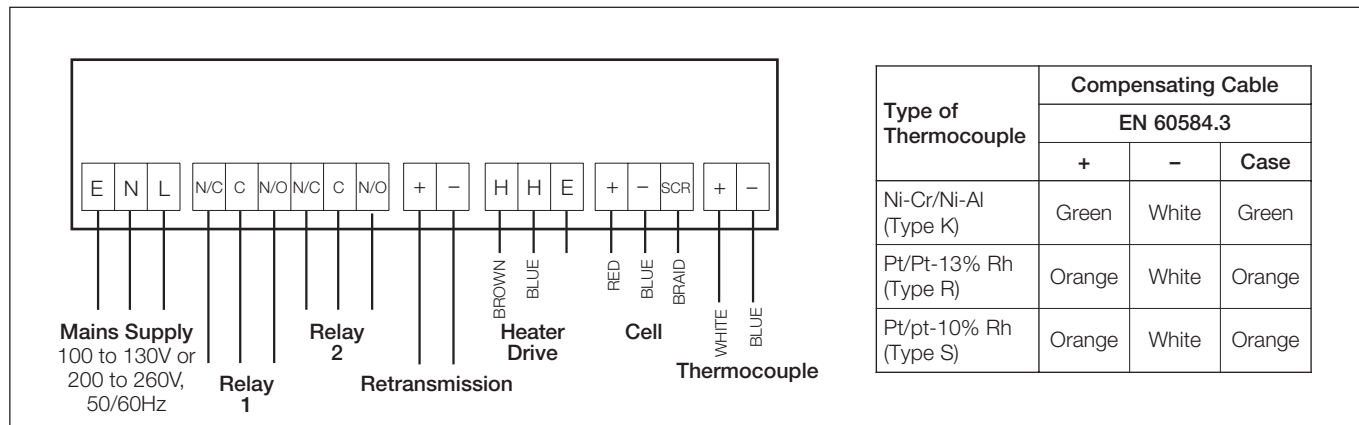
#### Dimensions

252mm (9.9 in.) wide x 453mm (17.8 in.) high x 150mm (5.9 in.) deep.

#### Weight

9kg (19.8 lb) approx.

## Electrical Connections



## Ordering Information

High Temperature Zirconia Oxygen Analyzer – ZDT-GP Series	ZDT/	1	X	X	X
Probe Type					
ZGP2		1			
Thermocouple Type					
None			0		
Type K			1		
Type R			2		
Type S			3		
Reference Air Supply					
None				0	
External Output				1	
Mains Voltage					
230V 50/60Hz					0
110V 50/60Hz					1

ABB has Sales & Customer Support expertise in over 100 countries worldwide

www.abb.com

The Company's policy is one of continuous product improvement and the right is reserved to modify the information contained herein without notice.

Printed in UK (12.06)

© ABB 2006



**ABB Limited**  
Oldends Lane, Stonehouse  
Gloucestershire  
GL10 3TA  
UK  
Tel: +44 (0)1453 826661  
Fax: +44 (0)1453 829671

**ABB Inc.**  
Analytical Instruments  
9716 S. Virginia St., Ste. E  
Reno, Nevada 89521  
USA  
Tel: +1 775 850 4800  
Fax: +1 775 850 4808