

ZDT-GP Series High Temperature Zirconia Oxygen Analyzer

Superior technology and
quality from the world leader
in oxygen measurement



User-friendly

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

Reliable

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

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 %O₂, 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:

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

Where: T = Absolute temperature (°K)

P₀ = Partial pressure reference O₂ (air)

P₁ = Partial pressure sample O₂

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⁻¹ (0.264 galls min⁻¹).

Construction and Operation

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

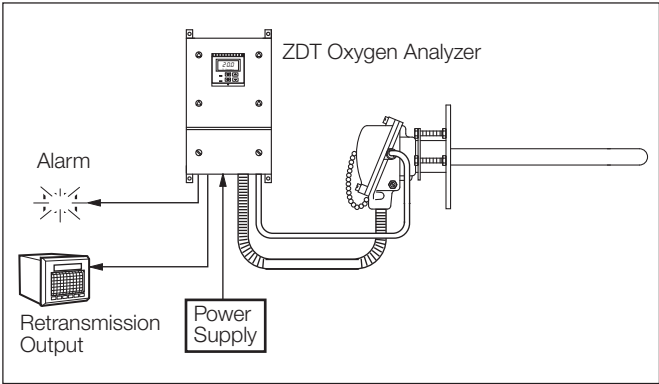
The analyzer is based on the proven 4600 Series transmitter with a two-line display and four tactile membrane switches. The measured value display-line is a 5-digit, 7-segment green back-lit LCD while the information display-line is a 16-character, single-line, dot-matrix, green back-lit LCD.

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

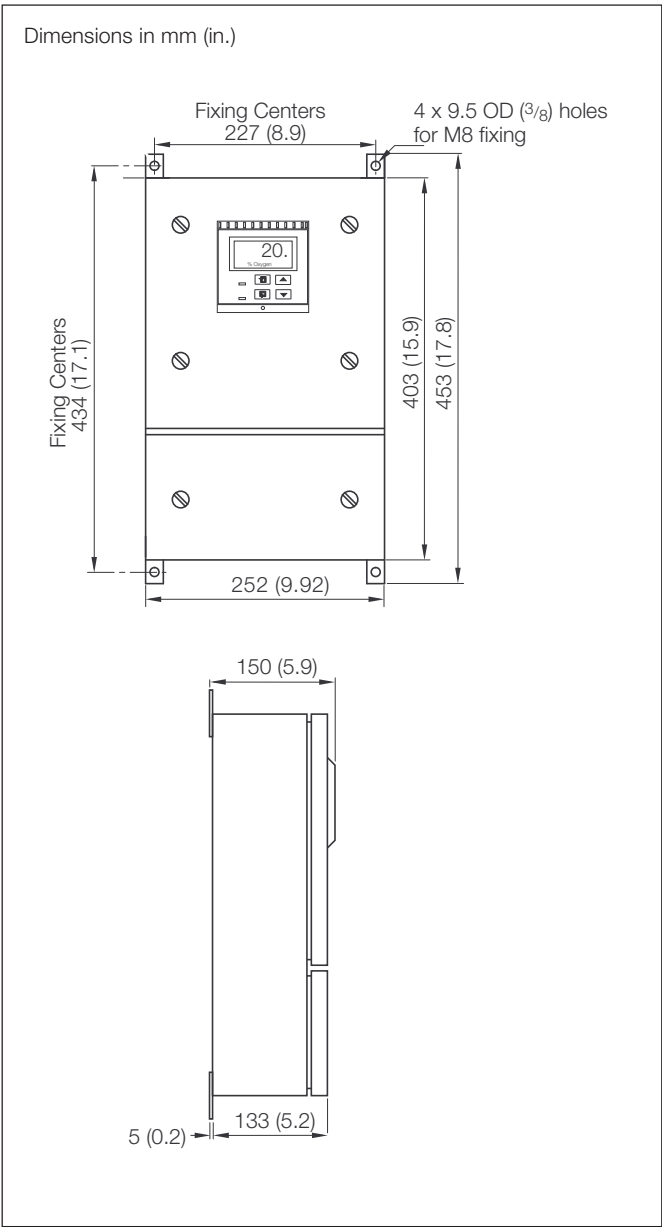
The  switch enables movement from the 'Operating Page' to the oxygen calibration sequence. Use of the appropriate security code allows further access to the pages for 'Set Up Outputs' and 'Electrical Calibration'. The  switch is used to select the various programming pages while the  and  switches change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

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

Schematic Diagram



Overall Dimensions – Analyzer



Specification – Analyzer

Display

Measured value

5-digit x 7-segment back-lit LCD

Information

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

Parameters

%O₂ (0 to 25%)

Cell temperature

Cell mV

Two O₂ 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 O₂ whichever is greater

Retransmission

≤± 2% of reading

or ±0.1% O₂ 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% O₂ (linear)
(5% minimum span)
0.01 to 25% O₂ (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)

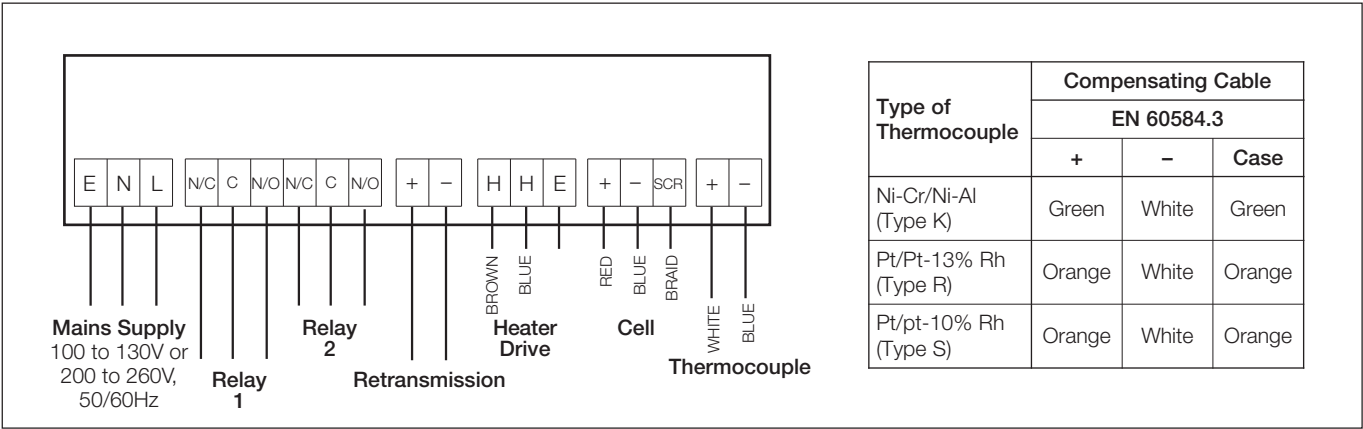
Dimensions

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

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