Data Sheet

SS/ZDT–FG Issue 10

Low Temperature Zirconia Oxygen Analyzer

ZDT–FG

- **Environmental certification**
  - MCERTS SIRA certificate MC99000 1/00
- **User-friendly**
  - language options
  - selectable system alarms
  - comprehensive diagnostics
  - includes reference air supply
- **Reliable**
  - steel enclosure
  - NEMA 4X/IP66
  - proven track record

MCERTS SIRA ML9900 1/00

SIRA Certificate Nº ML9900 1/00

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 for combustion control and efficiency management. The Unit is used in conjunction with the high quality ABB zirconia oxygen probes.

The low temperature version of the ZDT is designed to operate with the ZFG2 low temperature oxygen probe – see separate data sheet SS/ZFG2.

The standard analyzer has high/low alarm relays and a single linear or logarithmic isolated retransmission. Display features include %O2, cell temperature, heater control output, 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:

$$E(mV) = 0.496T\left(\log_{10}\frac{P_0}{P_1}\right) \pm C(mV)$$

Where

T = Absolute temperature (°K)

P_0 = Partial pressure reference O_2 (air)

P_1 = Partial pressure sample O_2

C = Cell constant

0.0496 = Faraday’s Gas Constant

Reference air for the ZFG2 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 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.

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_2 (0 to 25%)
Cell temperature
Cell mV
Two O_2 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_2 whichever is greater

Retransmission
± 2% of reading
or ±0.1% O_2 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 ZFG2 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
Up to 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_2 (linear)
(5% O_2 minimum span)
0.01 to 25% O_2 (logarithmic)
(Programmable for any two decades within 0.01 to 25% O_2)

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
750R (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.

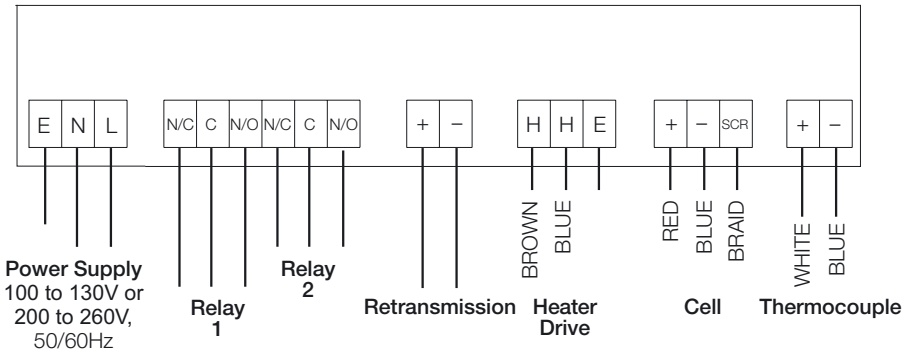
Weight
9kg (19.8 lb) approx.

Certification

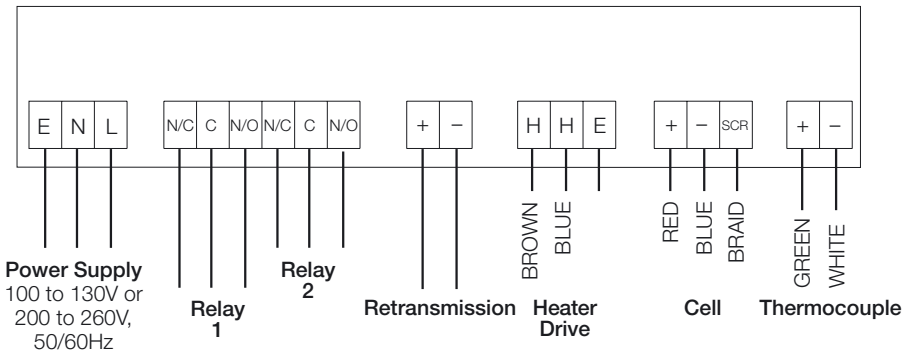
MCERTS
Sira certificate MC990001/00

Electrical Connections

ABB Supplied Conduit



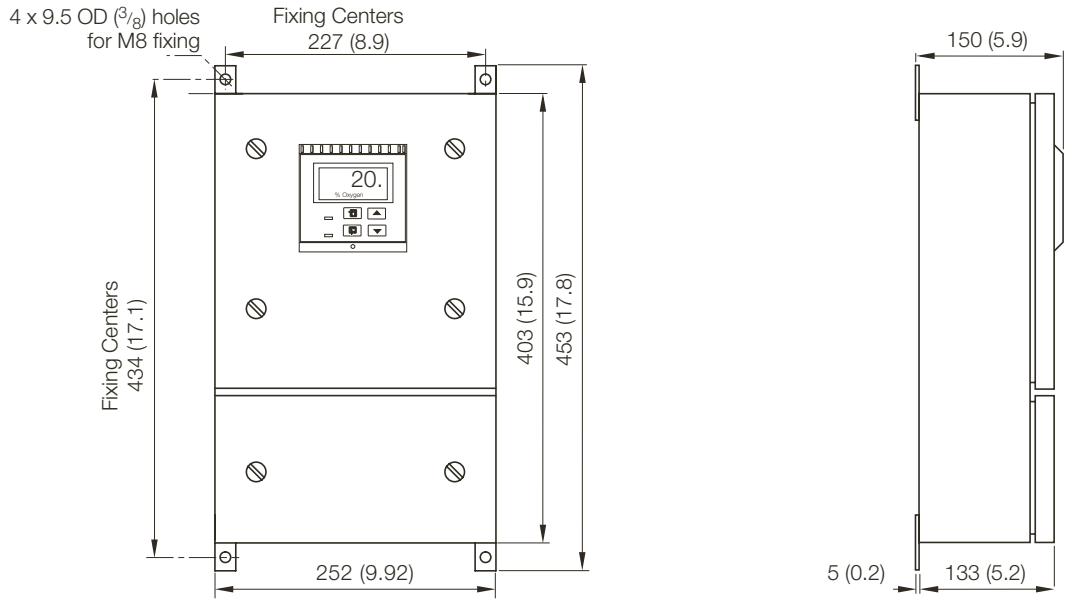
User Supplied Cables



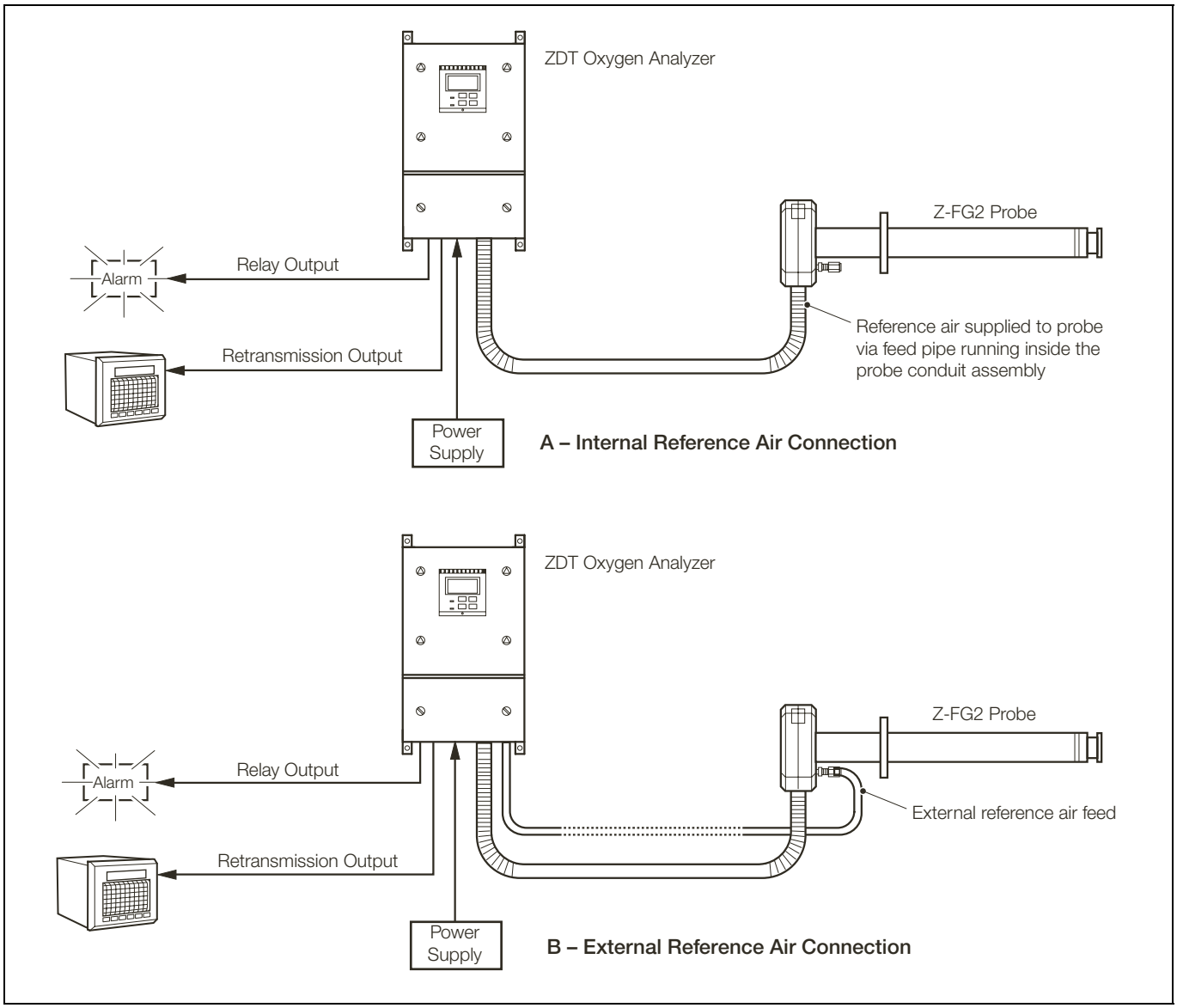
Cable/Tubing Reference	Description
Cell output cable	16/0.2 laid-up red and blue twin copper braid with overall PVC sheath
Thermocouple cable	Ni Cr/Ni Al (Type K EN60 584.3)
Heater cable	Max. run 100m (328 ft.). Max. loop impedance 2Ω
Air tubing	¼ in. (0.64mm) OD x 1/8 in. (0.32mm) stainless steel, nylon or PVC tube (100°C [212°F] ambient max.)

Overall Dimensions – Analyzer

Dimensions in mm (in.)



System Schematic Diagram



Ordering Information

Low Temperature Zirconia Oxygen Analyzer – ZDT-FG Series	**ZDT/**	**0**	**1**	**X**	**X**
Probe Type					
ZFG2		0			
Thermocouple Type					
Type K			1		
Reference Air Supply					
None				0	
External Output				1	
Internal Output				2	
Mains Voltage					
230V 50/60Hz					0
110V 50/60Hz					1

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Printed in UK (03.08)

SS/ZDT–FG Issue 10

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