XTP Series
Oxygen Analyzers in Safe or Hazardous Areas

A range of linear and stable thermo-paramagnetic analyzers for measurement of oxygen in a variety of applications with background gases such as Nitrogen, Carbon Dioxide, Methane and Hydrogen. The stainless-steel sensor is housed in either a wall-mounted IP55 case suitable for indoor use (XTP501) or a rugged IP66 casing (XTP601), making it suitable for a wide range of applications. The XTP601 analyzer can be supplied with flame arrestors making it explosion-proof and suitable for use with flammable gases and/or installation in hazardous areas.

SIL2 Capable

Highlights

- ATEX, IECEx, UKCA, TR CU Ex & cQPSus rated (XTP601)
- XTP601 can be supplied meeting the requirements of IEC 61508 (SIL2 Capable)
- Touch-screen display allows calibration or adjustment without a hot works permit (XTP601)
- Low cost of ownership due to minimal maintenance
- Measurement ranges from 0...0.5 % to 0...50 % O_2 and 20/80/90...100 % O_2
- Accuracy of better than ±1 % full scale (±0.2 % O_2 between 80 and 100 %)
- IP55 or IP66 enclosure options
- Light guide to NAMUR 44 standard (XTP501 only)
- 2 x 4...20 mA outputs and Modbus RTU over RS485 as standard

Applications

- Monitoring inert blanketing gases for hydrocarbon processing
- Inert gas for pharmaceutical or chemical industries
- Biogas, waste, landfill and digester plants
- Furnace gas control in steel industry
- N_2 generators
- O_2 generators

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XTP Series Oxygen Analyzers

Technology

Oxygen is a paramagnetic gas, which means that it is attracted by a magnetic field. This magnetic susceptibility is much greater for O2 than that of most other gas molecules and therefore this physical property is ideal for the determination of the level of oxygen in a wide range of background gases.

The XTP Series thermo-paramagnetic oxygen analyzer combines the paramagnetic and thermal conductivity technologies to accurately measure oxygen. The instrument is very stable which gives the user confidence in the measurement. This is important in safety applications such as blanketing of vessels or reactors in chemical plants.

In addition to the stability of the Michell XTP sensor, the insensitivity to mechanical shock is another advantage of the thermo-paramagnetic technology. As it relies solely upon fluctuations in magnetic fields, and not internal moving parts, the sensor will operate efficiently under a wide range of environmental conditions. It is suitable for installation where vibration or movement could pose a problem for other sensor types. The measuring sensors are coated in borosilicate glass and mounted on platinum wire giving excellent resistance to corrosion and less susceptible to permeation of hydrogen or helium.

SIL2 Capable Option

The XTP601 can now be purchased meeting the requirements of IEC 61508 (SIL2 Capable). A supplementary SIL manual will be supplied with the analyzer allowing the user to integrate the unit into their functional safety system.

Features

High Sensor-Stability Reduces Calibration Costs

The sensor design largely eliminates drift associated with other comparable devices, improving the stability of the measurement. This allows longer calibration intervals and reduces both labour and consumable costs.

Reliable Long-Term Performance

The non-depleting sensor has no moving parts, and is therefore not affected by vibration or movement. This makes it suitable for remote and offshore installations and offers a low cost of ownership.

Easy Installation with Local Display

The analyzers are either IP55 or IP66 and can be installed very close to the sample point. This provides many benefits such as:

- With built-in HMI, no need to radio/walk back to a control room (saves effort)
- Less sample line or cabling (saves cost)
- Greater choice of installation points (flexibility)

Outputs:

The Analyzers are supplied with the following as standard:

- Two 4...20 mA outputs
- Modbus RTU over RS485
- Two alarm relays for concentration
- mA can be driven High or Low according to NAMUR when cell temperature is not stable.

Flexible Packaging

The XTP Series oxygen analyzers are suitable for Safe (GP) or Hazardous (EX) Area classification depending on the individual customer's needs. This allows the user to determine the price to feature ratio that best suits each installation.

XTP601 (EX1, GP1 or GP2)
The analyzer provides a local HMI for the user to access all the functions of the analyzer through the glass via capacitive buttons. As well as displaying the target gas concentration, there is a status bar showing messages. The user can scroll through the front screens to see a graph of the latest period (user defined), min and max values, reading from an external sensor and alarm history.
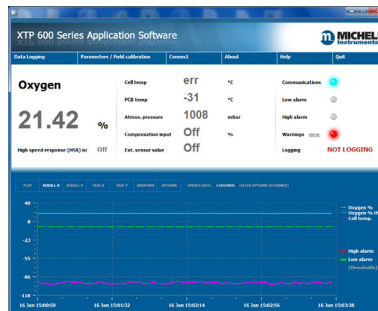

XTP501 (GP1)
This analyser is suitable for light industrial applications and shares all the same features and benefits in a lightweight IP55-rated wall-mounted enclosure. All electrical connections are accessible without opening the case and all mating connectors are supplied.

XTP501 (GP2)
The base model oxygen gas analyzer without integrated display for customers with a local control system. An optional remote display is available for set-up, diagnostics and calibration for clients with multiple units.
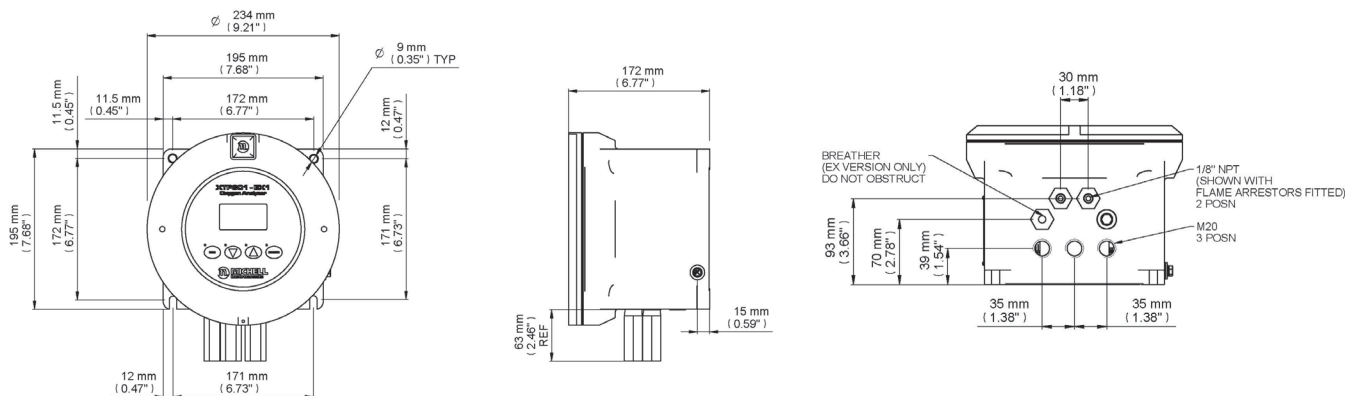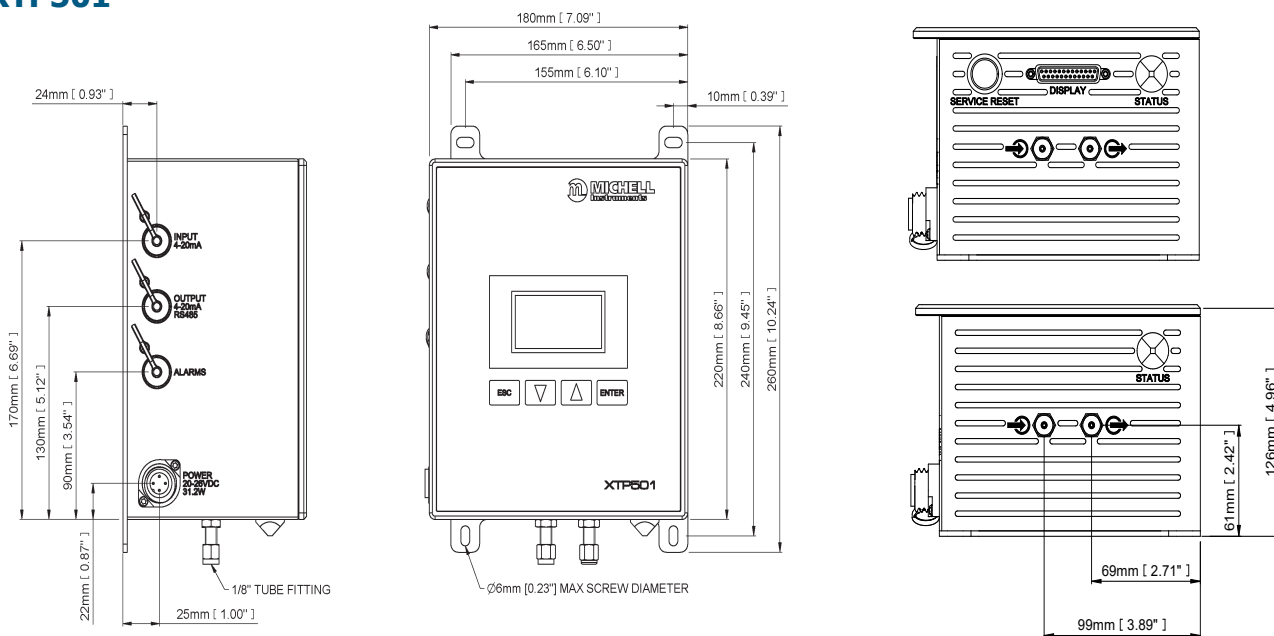

Application Software
The XTP application software will allow the user remote access to the unit. This includes displaying the target gas concentration, alarms, graphs, changing parameters and even remote calibration.

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Product Dimensions

XTP601

XTP501

Related Industrial Products

Minox i

Intrinsically Safe Oxygen Transmitter

XTC601

Binary Gas Analyzer

Easidew PRO I.S.

Process Dew-Point Transmitter

GPR-1200 ATEX

Portable Trace Oxygen Analyzer

Technical Specifications

Product	XTP601	XTP501
Performance Specifications		
Measurement Technology	Thermo-paramagnetic oxygen sensor	
Measured Gas	Oxygen (O_2)	
Background Gas	Analyzer is calibrated in the background gas of the process. Standard backgrounds include N_2, CO_2, CH_4, H_2, He & BIOGAS.	
Gas Requirements	Non-condensing sample with particles <3μm	
Measurement Range	Analyzer is calibrated to the range the customer requires. Select from: 0...0.5 % up to 0...50 % and 20...100 % up to 90...100 %	
Display Resolution	0.01 %; 0.1 % for suppressed zero ranges	
Display Type	Backlit LCD (not on 501-GP2 model)	
Intrinsic Error (Accuracy)	< ±1 % of range or ±0.02 % O_2, whichever is greater < ±0.2 % O_2 or ±1 % of range, whichever is greater (for suppressed zero ranges 20/80/90 to 100 %)	
Response Time (T90)	< 15 seconds (with High Speed Response (HSR) Enabled)	
Repeatability	±0.2 % of range or ±0.02 % O_2, whichever is greater	
Linearity	±0.5 % of range or ±0.05 % O_2, whichever is greater	
Zero Stability	±0.25 % of range per month	
Range Stability	±0.25 % of range per month	
Sample Flow Rate (General Purpose)	100...500 ml/min (0.25...1.0 scfh)	
Sample Flow Rate (Ex Version)	270...330 ml/min (0.57...0.7 scfh)	N/A
Sample Flow Effect	< 1 % of range for flows within stated range (calibrated at 300 ml/min)	
Sample Pressure	0.75...2 BarA (unit must be calibrated at the same pressure as sample)	
Sample Temperature	A constant temperature of +5...+45/+55 °C (+41...+113/+131 °F)	A constant temperature of +5...+45 °C (+41...+113 °F)
Sample Cell Temperature	+50/+60 °C (+122/+140 °F)	+50 °C (+122 °F)
Electrical Specifications		
Analog Inputs	1 off mA input for an external sensor (can be displayed on the screen) 1 off mA input to act as an active compensation for the process conditions	
Analog Outputs	2 off 4...20 mA outputs (powered with 24V excitation voltage)	
Output Ranges	Primary range is set to the calibrated range of the instrument. The second is user-selectable	
Alarms	2 off single pole changeover relays for O_2 concentration (250 V, 5 A max)	
Datalogging	Digital communications can be used to log the output from the analyzer on an external device	
Digital Communications	Modbus RTU over RS485	
Power Supply	24 V DC, 1.6 A max	
Operating Conditions		
Ambient Temperature	+5...+60 °C (+41 °F...+140 °F) +5...+50 °C (+41...+122 °F) cQPSus	+5...+50 °C (+41 °F...+122 °F)
Mechanical Specifications		
Warm-up Time	< 25 minutes (at 20 °C/68 °F ambient)	
Stabilization Time	5 minutes	
Wetted Materials	316L stainless steel, borosilicate glass, platinum, (plus O-ring)	
Dimensions (w x d x h)	234 x 234 x 172 mm (9.21 x 9.21 x 6.77")	260 x 180 x 128 mm (10.24 x 7.09 x 5.04")
Weight	9.7 kg (21.3 lbs)	Approx. 3 kg (6.6 lbs)
O-Ring Materials	Viton, Silicone or Ekraz	Viton
Gas Connection	1/4" NPT Female (GP1) 1/8" NPT Female (Ex & GP2)	1/8" bulkhead standard
Ingress Protection	IP66, NEMA 4X	IP55
Hazardous Area Classification		
ATEX/UKCA	II 2 G D Ex db IIB +H2 T6 Gb Ex tb IIIC T85 °C Db IP66	N/A
IECEx	Ex db IIB +H2 T6 Gb Ex tb IIIC T85 °C Db IP66	N/A
Temperature Ranges for ATEX/UKCA and IECEx as per O-Ring Type	Silicon: Ta O-ring = -40 °C...+60 °C * Viton: Ta O-ring = -15 °C...+60 °C * Ekraz: Ta O-ring = -10 °C...+60 °C *	N/A
cQPSus	Class I, Division 1, Groups BCD T6 Class II, Division 1, Groups EFG Class I, Zone 1, AEx/Ex db IIB+H2 T6 Gb Zone 21 AEx/Ex tb IIIC T85°C Db	N/A
TR CU Ex	1Ex d IIB+H2 T6 Gb	N/A

* Maximum temperature of +50 °C for North America, +55 °C for TR CU Ex (EAC).

Michell Instruments adopts a continuous development programme which sometimes necessitates specification changes without notice.
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