

# 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 316 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 installation in hazardous areas.



### Highlights

- ATEX, IECEx, TC TR Ex & cCSAus rated
- 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<sub>2</sub> and 20/80/90-100% O<sub>2</sub>
- Accuracy of better than ±1% full scale
- IP55 or IP66 enclosure options
- Light guide to NAMUR 44 standard (optional on XTP601)
- 2 x 4–20 mA outputs and MODBUS RTU over RS485 protocol 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<sub>2</sub> generators
- O<sub>2</sub> generators

# 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 O<sub>2</sub> 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.

## 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 thermal conductivity 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 Analyzer provides two 4–20 mA outputs and is housed in a splash-proof or weather-proof casing, allowing the analyzer to be placed at the point of measurement.

The closer the analyzer can be installed to the sample point, the better, for many reasons. These include:

- faster overall speed of response (for safety)
- less sample line or cabling (saves cost)
- greater choice of installation points (flexibility)
- having a local display does not require two operators (or walking back and forth to the control room) for maintenance or diagnostics

## 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.



Technical Specifications		
Product	XTP601	XTP501
<b>Performance Specifications</b>		
Measurement Technology	Thermo-paramagnetic oxygen sensor	
Measured Gas	Oxygen (O <sub>2</sub> )	
Background Gas	Analyzer is calibrated in the background gas of the process. Standard backgrounds include N <sub>2</sub> , CO <sub>2</sub> , CH <sub>4</sub> , H <sub>2</sub> , 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, 80 or 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 span or ±0.02% O <sub>2</sub> , whichever is greater < ±0.2% O <sub>2</sub> or 1% of range, whichever is greater (for suppressed zero ranges 20/80/90 to 100%)	
Response Time (T90) with High Speed Response (HSR) Enabled	< 15 seconds	
Repeatability	±0.2% of span or 0.02% O <sub>2</sub> , whichever is greater	
Linearity	±0.5% of span or 0.05% O <sub>2</sub> , whichever is greater	
Zero Stability	±0.25% of span per month	
Span Stability	±0.25% of span per month	
Sample Flow Rate (General Purpose)	100 to 500 ml/min (0.2 to 1.27 scfh)	
Sample Flow Rate (Ex Version)	270 to 330 ml/min (0.54 to 0.66 scfh)	N/A
Sample Flow Effect (Calibrated at 300 ml/min)	< 1% of span for flows within stated range	
Sample Pressure	0.75 to 2 BarA (unit must be calibrated at the same pressure as sample)	
Sample Temperature	A constant temperature between 5 and 55°C	
Sample Cell Temperature	+50°C (optional on 601 model only: +55 °C and +60 °C)	
<b>Electrical Specifications</b>		
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 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 Protocol	
Power Supply	24 V DC, 1.5 A max	
<b>Operating Conditions</b>		
Ambient Temperature	+5 to +55 °C	+5 to +40 °C
<b>Mechanical Specifications</b>		
Warm-up Time	< 25 minutes (at 20°C ambient)	
Stabilization Time	5 minutes	
Wetted Materials	316 stainless steel, borosilicate glass, platinum, (plus O-ring)	
Dimensions (w x d x h)	234 x 234 x 172mm	260 x 180 x 128mm
Weight	9.7 kg	Approx. 3kg
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 4	IP55
<b>Hazardous Area Classification</b>		
ATEX	II 2GD Ex d IIB +H2 T6 Gb Ex tb IIIC T85°C Db IP66	N/A
IECEX	Ex d IIB +H2 T6 Gb Ex tb IIIC T85°C Db IP66	N/A
Temperature Ranges for ATEX and IECEX as per O-Ring Type	Silicon: Ta O-ring = -40°C to +55°C Viton: Ta O-ring = -15°C to +55°C Ekraz: Ta O-ring = -10°C to +55°C	N/A
cCSAus	Class I, Division 1, Groups B,C,D T6	N/A
TC TR Ex	1Ex d IIB+H2 T6 Gb	N/A

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