Apollo

Preliminary Data Sheet

OXY-Flex Oxygen Analyser

FEATURES

- High accuracy linear output
- Selectable measurement ranges: 0-25% or 0-100% O_2
- Selectable outputs: 4-20mA and 0-10V_{DC} or RS232 comms interface
- Externally triggered automatic or manual calibration
- Can be calibrated in normal air (20.7% O_2) or in any other known O_2 concentration
- Cycling 3.3V_{DC} logic output allows direct monitoring of the O_2 sensor pump cycle for diagnostic purposes
- Variable output filtering allows fast and dynamic to slow and stable output responses

SPECIFICATIONS

Maximum ratings

Supply voltage		24V_{DC} ± 10%
Current consumption		500mA max @ 24V_{DC}
4-20mA Load		100-750Ý
Temperature limits (electronics enclosure)		
Storage		-10 to 60°C
Operating		-10 to 60°C
Temperature limits (permissible gas temperature at sensor tip)		
Operating	(Standard Temp)	-100 to 250°C
	(High Temp)	-100 to 400°C
Gas flow rate		0 to 10 m/s
Weight		<450g
Incidental permissible acceleration		30g
Repetitive permissible acceleration		5g
Sealing Rating		IP65

APPLICATIONS

- Combustion control including oil, gas and biomass boiler applications
- Composting
- Laboratory & building air quality monitoring including confined space personnel safety
- Industrial process control i.e. gas mixing for welding and steel making
- Oxygen generation systems
- Medical
- Scientific including respiratory studies of a community or an organism, plants and animals for example
- Food and beverage packaging
- Applications where low oxygen is key including fermentation, rust and corrosion prevention, inerting and purging

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DESCRIPTION

The OXY-FLEX-X-X Series Standard Temperature Oxygen Analyser is designed to determine the oxygen concentration in air or inert gas mixtures with temperatures of -100 to +250°C max.

The OXY-FLEX-X-X-H Series High Temperature Oxygen Analyser is designed to determine the oxygen concentration in air or inert gas mixtures with temperatures of -100 to +400°C max.

These products are particularly suitable for measuring oxygen in areas that are not easily accessible, or in closed systems, such as ventilation pipes, flues and containers.

The OXY-FLEX Series can be factory configured with measuring ranges of 0.1% to 25% Vol. O_2 and 0.1% to 100% Vol. O_2. The entire measurement range is linear in both cases. The output can be configured to either 4-20mA and 0-10V_{DC} or RS232 PC interface. All settings can be altered by the customer should their measurement or interface requirements change.

The actual oxygen sensor is mounted in the tip of the stainless steel probe and is protected by a stainless-steel sintered cap which acts as both a large particulate filter and also as a flame trap. The IP65 waterproof die-cast aluminium housing accommodates the electronics and is mechanically connected to the sensor probe.

The sensor outputs the measured values simultaneously via 2 output channels (4 to 20mA and 0 to 10V or RS232 Rx and Tx) both channels are referenced to the system GND. A Digital 3.3V_{DC} logic output cycles at the same frequency as the electrochemical pumping action of the oxygen sensing cell, thus providing a real time sensor health check, if the output ceases to cycle the sensor has entered a start-up or error state. This provides fault proof operation.

Calibration is achieved by pulling the calibration input to GND. On doing so the output will either automatically calibrate to a fixed reference or can be manually calibrated to any output by way of a PCB mounted potentiometer. The fixed reference is factory set to 20.7% O_2 for calibration in normal air though this value may be altered via the RS232 interface for calibration with reference gas of a known oxygen concentration. Calibration is stored on power loss. Again the auto or manual calibrate function is user configurable.

Regular calibration removes the effects of application and atmospheric pressure changes and also eliminates any sensor drift.

For more detailed information on the operation of SST Sensing Oxygen Sensors please refer to the following application note via our website:

AN0043 Operation Principle and Construction of Zirconium Dioxide Oxygen Sensor.

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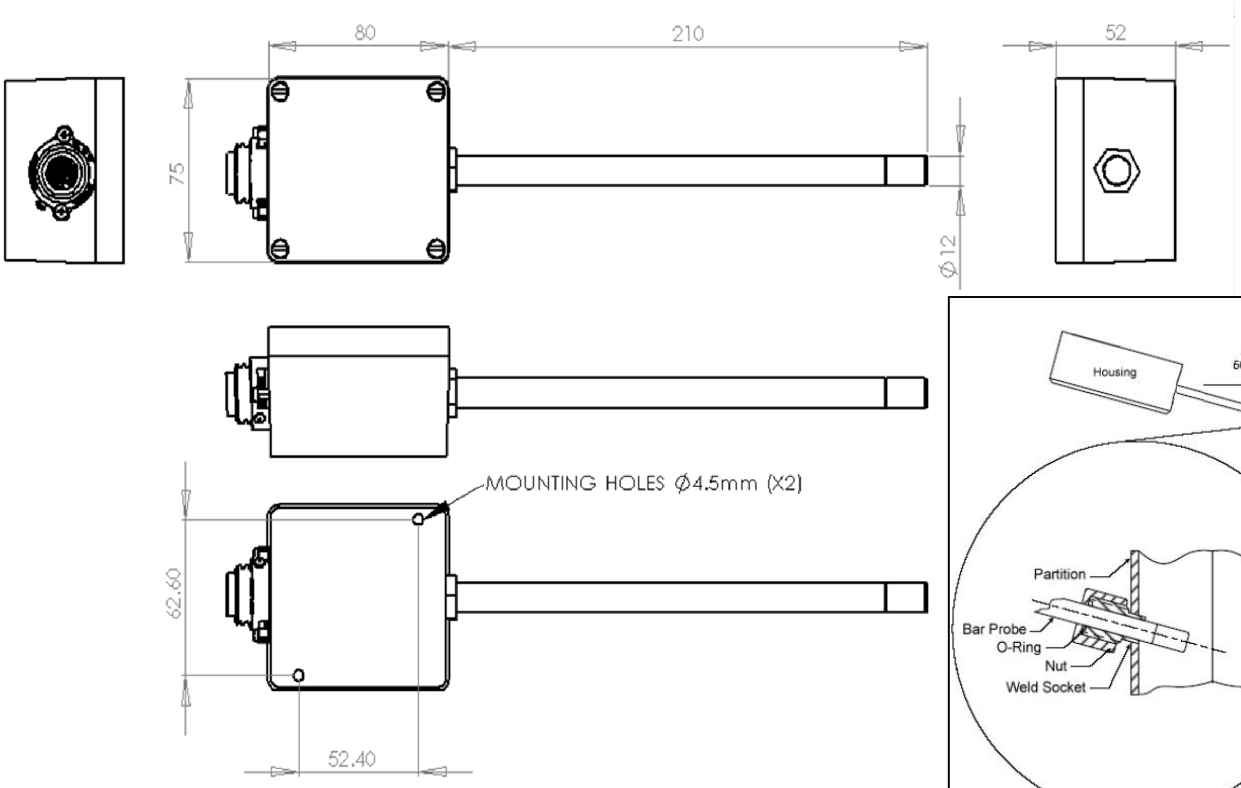
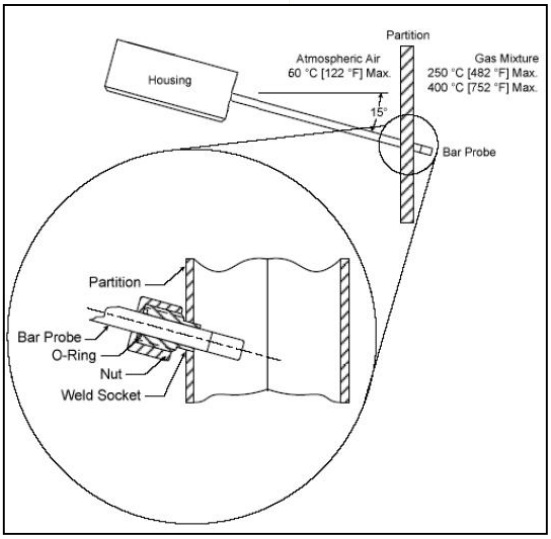
PERFORMANCE CHARACTERISTICS

Characteristics	Min.	Typ.	Max.	Unit
Output inactive start up delay (heater warm up)		30		s
Initial warm up time (till stable output)	5	10		min
Measuring ranges (oxygen partial pressure)	1		1000	mbar
Accuracy (TBC)			2	% FS
Repeatability (TBC)			1	% FS
0-10 V_{DC} Output Resolution			0.01	V
4-20mA Output Resolution			0.01	mA
RS232 Output Resolution			0.01	%
Reaction time (zero output filtering in normal air)			1	s

OUTLINE DRAWING AND MOUNTING INFORMATION



Mounting holes accessible on removal of housing lid



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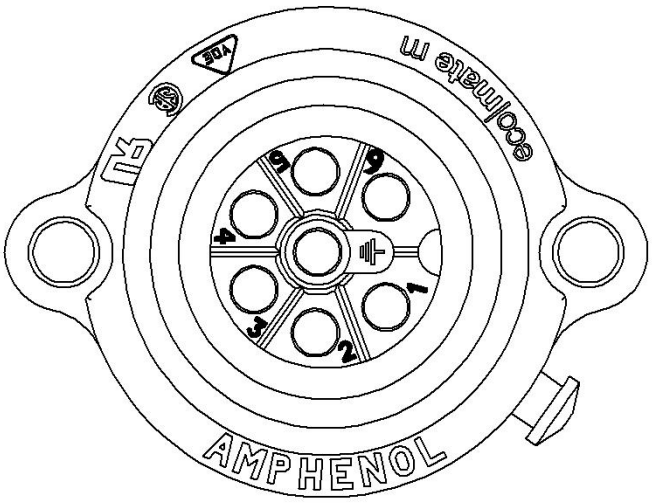
ELECTRICAL CONNECTIONS

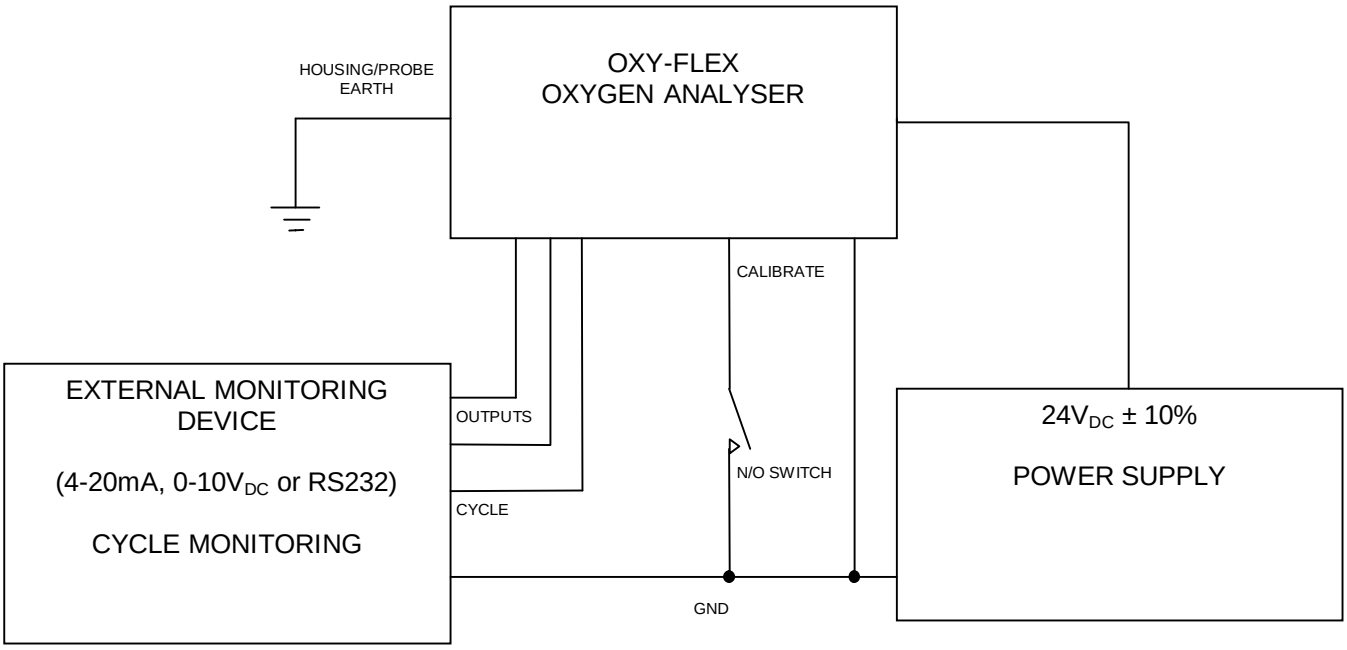


PIN	Description
1	$24V_{DC}$ ± 10%
2	GND
3	Calibrate
4	Cycle
5	4-20mA/RS232 Tx
6	0-$10V_{DC}$/RS232 Rx
CENTRE	Housing/Probe Earth

Housing Connector: Amphenol Ecomate C016 30C006 100 12
Mating Connector: Amphenol Ecomate C016 30D006 100 10
1 x Mating Connector supplied with each product

When connecting the OXY-FLEX via the RS232 connection ensure Tx goes to Rx of the PC and Rx goes to Tx of the PC. Baud rate should be set to 9600.

SYSYEM BLOCK DIAGRAM



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CALIBRATION PROCEDURE

Automatic Calibration

- Ensure the OXY-FLEX is configured for automatic calibration. See CONFIGURATION below.
- Place the sensor probe in the calibration gas, typically normal air.
- Allow the output to stabilise for at least 5 mins. 10 mins if powering from cold.
- Apply GND to the calibrate input (PIN 3) for a minimum 2s.
- The output should track to the correct value
- Calibration is complete and the new calibration value is stored in memory. Calibration is retained on power loss.

Changing the Automatic Calibration Value

The system is factory set to automatically calibrate to 20.7% O_2, however this value may be changed via the RS232 interface.

- Connect the OXY-FLEX via the RS232 interface to the PC. See CONFIGURATION below.
- Enter your security password
- In the Configuration menu change the auto-cal value to your desired value
- Press enter to save
- The new Automatic Calibration value is now stored in memory. This value is retained on power loss
- Reconfigure the output to the correct settings for your application. See CONFIGURATION below.

CONFIGURATION

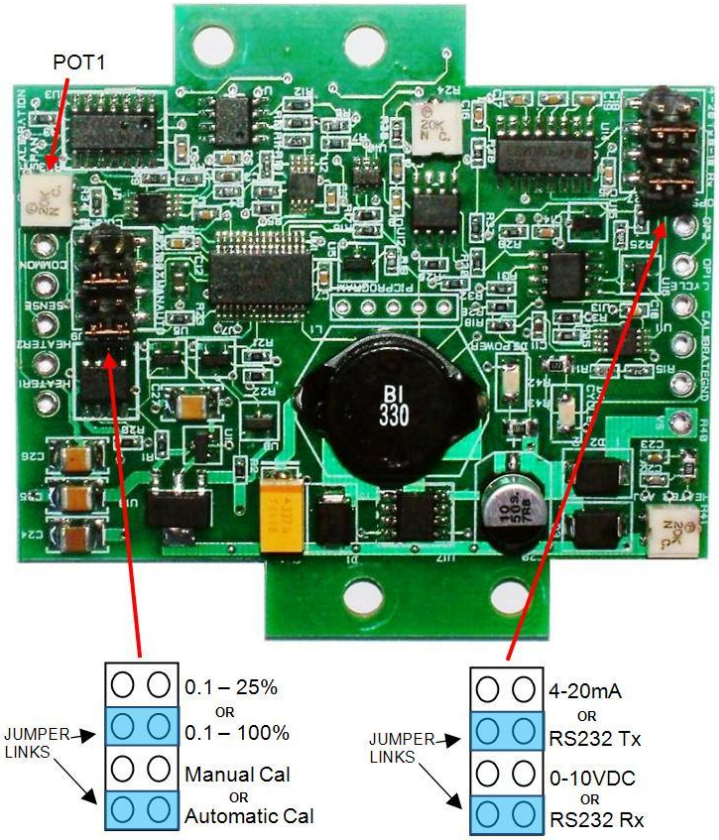
The OXY-FLEX may be reconfigured at any time by adjusting the position of the header pin jumper links on the interface PCB.

WARNING: Prior to re-configuration the OXY-FLEX **MUST** be powered down. The jumper links **MUST** also be repositioned correctly and in the correct orientation. Failure to adhere to the above could result in product damage. Products damaged due to incorrect configurations will not be covered under warranty.

- Power down the OXY-FLEX
- Remove the lid using a Philips screwdriver
- Adjust the position of the jumper links to the desired configuration. The opposite diagram shows the Interface PCB and the correct positioning for each user configurable option. Thin nosed pliers should be used to remove and replace the Jumper Links. Ensure the Jumper Links are correctly seated before reapplying the power

Manual Calibration

- Ensure the OXY-FLEX is configured for manual calibration. See CONFIGURATION below.
- Place the sensor probe in the calibration gas, typically normal air.
- Allow the output to stabilise for at least 5 mins. 10 mins if powering from cold.
- Apply and hold GND to the calibrate input (PIN 3).
- Adjust the calibrate span pot (POT 1, highlighted below) until the output equals the correct value of the calibration gas concentration.
- Release GND from the calibrate input (PIN 3).
- Calibration is complete and the new calibration value is stored in memory. Calibration is retained on power loss.



NOTE: Each Jumper Link must be placed in one of the two positions. When selecting the output, you must choose either 4-20mA and 0-10V_{DC} or RS232 Tx and Rx. Ensure the Jumper Links are always inserted horizontally between 2 adjacent pins.

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ORDERING INFORMATION

Part number	Output Type	Calibration Type	Measuring Range	Gas Temperature
OXY-FLEX-0-A	4 to 20mA	Auto/Man	0.1 to 25% Vol. O_2	-100 to 250°C
OXY-FLEX-0-V	0 to 10V	Auto/Man	0.1 to 25% Vol. O_2	-100 to 250°C
OXY-FLEX-0-RS	RS232	Auto/Man	0.1 to 25% Vol. O_2	-100 to 250°C
OXY-FLEX-1-A	4 to 20mA	Auto/Man	0.1 to 100% Vol. O_2	-100 to 250°C
OXY-FLEX-1-V	0 to 10V	Auto/Man	0.1 to 100% Vol. O_2	-100 to 250°C
OXY-FLEX-1-RS	RS232	Auto/Man	0.1 to 100% Vol. O_2	-100 to 250°C
OXY-FLEX-0-A-H	4 to 20mA	Auto/Man	0.1 to 25% Vol. O_2	-100 to 400°C
OXY-FLEX-0-V-H	0 to 10V	Auto/Man	0.1 to 25% Vol. O_2	-100 to 400°C
OXY-FLEX-0-RS-H	RS232	Auto/Man	0.1 to 25% Vol. O_2	-100 to 400°C
OXY-FLEX-1-A-H	4 to 20mA	Auto/Man	0.1 to 100% Vol. O_2	-100 to 400°C
OXY-FLEX-1-V-H	0 to 10V	Auto/Man	0.1 to 100% Vol. O_2	-100 to 400°C
OXY-FLEX-1-RS-H	RS232	Auto/Man	0.1 to 100% Vol. O_2	-100 to 400°C

NOTE: All variants can have their Output Type and Measuring Range reconfigured at any time using the CONFIGURATION guide on Page 5.

WARNING	**CAUTION**
Personal Injury DO NOT USE these products as safety or Emergengy Stop devices or in any other application Where failure of the product could result in Personal injury. **Failure to comply with these instructions could Result in death or serious injury.**	Do not exceed maximum ratings and ensure sensor is operated in accordance with all requirements of AN0043 **Failure to comply with these instructions may result in product damage.** **It is the customer's responsibility to ensure that this product is suitable for use in their application. For techincal assistance or advice, please email us: info@sstsensing.com**

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