



The SenzTx is a compact and robust O<sub>2</sub> transmitter that utilises zirconia or electrochemical technology to give a reliable measurement of oxygen concentration.

The zirconia sensor offers fast response time and a long service life with virtually no drift, whilst the electrochemical sensor allows measurement in background gases containing hydrocarbons.

The minimum output range of 0 to 10ppm is ideal for nitrogen generation or glove box monitoring. The SenzTx transmitter can also be supplied with measuring ranges up to 0 to 100% O<sub>2</sub> for oxygen concentrators.

The flexibility is further enhanced by process connection multiple output options.

## Applications

- » Gas generation (oxygen / nitrogen)
- » Additive manufacturing
- » Glove box purge and leak detection
- » Industrial gas applications

## Plug & Play Technology

## Features

- » Zirconia or electrochemical sensor technology options
- » Measurement range:  
0 to 10ppm up to 0 to 100% O<sub>2</sub>
- » Analogue output: 4 to 20mA
- » Modbus 485
- » 24VDC power supply
- » M12 electrical connection
- » Process connection: KF40 Flange or Flowthrough base
- » Combined Sensor & Electronics allows for ease of integration.
- » Fast reponse from ambient air to low PPM oxygen measurement

### Proven sensor technology

With a choice of either zirconia or electrochemical sensor technology the SenzTx offers reliability, accuracy and flexibility. Both technologies have a broad measurement capability allowing the user to measure from selected ranges from 1ppm to 100% oxygen.

### Zirconia sensor

The Ntron zirconia oxygen sensor is a non-depleting zirconia solid electrolyte sensor. A small capillary on the sensor controls the diffusion of oxygen into the sensor. When heated to over 400°C oxygen is electronically reduced causing current flow through the zirconia electrolyte. Zirconium-oxide allows the movement of oxygen ions through the substrate from a high to a low concentration. The measurement of oxygen is determined by the current flowing through the electrodes. The zirconia sensor has an unlimited shelf life without the loss of calibration and has an expected life of three to five years. The zirconia sensor is not position sensitive and has low cross sensitivity to other gases and does not dry out.

### Low maintenance and cost of ownership

Due to the highly stable nature of the sensor, a calibration interval of once per year is required, allowing for significant cost savings. The construction of our zirconia oxygen sensor means that only 100 mL/min of sample gas is required, providing application flexibility and further potential cost savings.

### Fast response time

Zirconia oxygen sensor have a fast recovery from ambient air to low PPM oxygen. The response time (T90) to step changes of concentration <10 seconds..

### Electrochemical sensor

The key elements of the electrochemical sensors are a membrane, cathode, anode, electrolyte and measurement circuit. The sensing membrane (covering the cathode) is made of PTFE and is mounted over a metal perforated electrode. The space between the membrane and the electrode is filled either with an aqueous alkaline or an acid electrolyte. In normal operation, all portions of the anode and cathode are immersed in the electrolyte. As oxygen diffuses through the membrane into the electrolyte it causes a reaction between the cathode and anode generating an EMF. This current is proportional to the amount of oxygen present in the sample gas. In the absence of oxygen there is no output from the electrochemical sensor, meaning only one calibration is required.

### Sensor construction

The main body of the sensor is fabricated from high density PVDF. The supporting ring at the face of the sensor is constructed of stainless steel. This results in an oxygen sensor that is chemically resistant to most sampling atmospheres and can be used with trace solvents and hydrocarbons present in the sample gas, unlike zirconia (due to the high temperature of the sensor).

### Installation flexibility

The compact SenzTx oxygen transmitter with its inbuilt microprocessor, is designed for OEM applications with minimal use input. With the flow through sensor with orifice option, the sensor can handle up to 2 bar g and provide the correct flow through the sensor. This eliminates the need for external flow control.

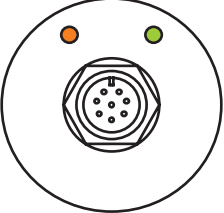
## TXi Communication & Diagnostics terminal

The TXi calibration makes set-up, calibration and diagnostics easy. Simply connect this unit in series with the SenzTx with the cable provided and perform the desired task without the need to look at the control panel which may be far away.



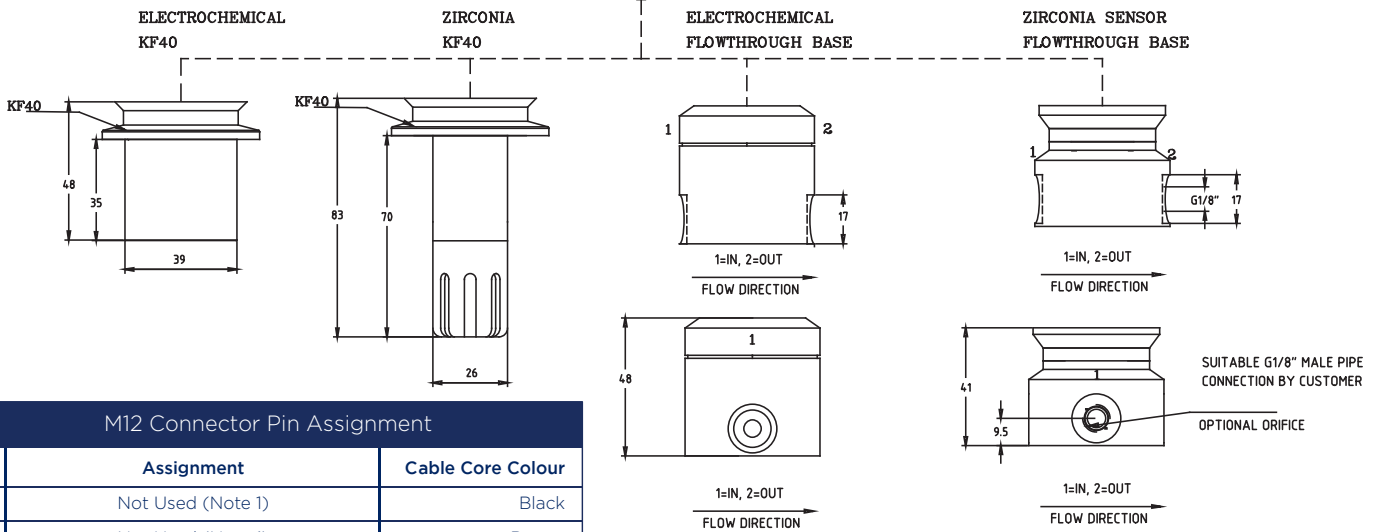
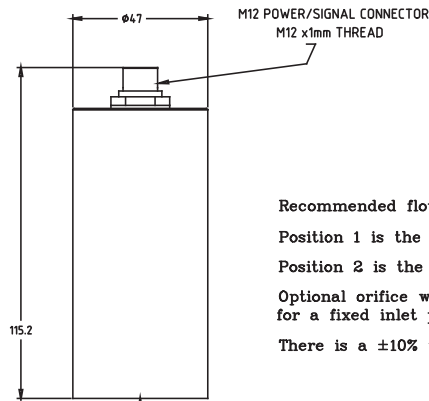
### Technical Drawings

**LED functionality**



**Orange LED**  
Modbus 485 Indicator

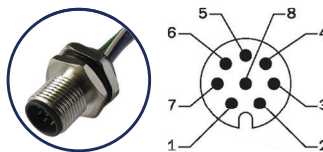
**Green LED**  
Power Indicator



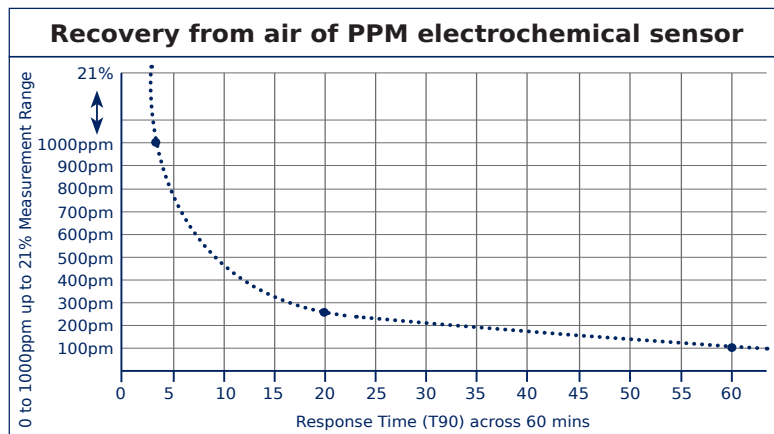
M12 Connector Pin Assignment

Pin	Assignment	Cable Core Colour
1	Not Used (Note 1)	Black
2	Not Used (Note 1)	Brown
3	Analogue Output Ground	Green
4	Serial RS485 (B)	Yellow
5	Serial RS485(A)	Grey
6	Power Ground OVDC	White
7	Power Supply +24VDC	Blue
8	Analogue Output (mA)(Note 1)	Red

Notes:  
1. Cable cores that are not used must be insulated / heat-shrunked.



Performance		
Transmitter Model	SenzTx	
Measurement technology	Zirconia (ZR)	Electrochemical (EC)
Measurement range*	0 to 1000ppm / 0 to 1% / 0 to 25% / 0 to 96% / 0 to 100%**	0 to 1000ppm / 0 to 25%
Output resolution ( for %)	0.01%	
Output resolution (for ppm)	1ppm	
Accuracy	+/-2% of reading (or 2ppm O2) @ calibrated temperature and pressure	
Response time (T90)	<10 seconds @ 25°C (within selected range)	
LDL (Sensitivity)	0.01% (when measuring %) / 1ppm (when measuring ppm)	
Temperature range	-20°C to +50°C	0°C to +45°C
Pressure range	900 to 1100 mBar <sub>abs</sub>	
Linearity	+/- 2% of reading	
Life expectation	3-5 years	1 year
Humidity	0-95% RH non-condensing	
Shelf life	No shelf life	
Electrical Input / Output		
Power supply	24VDC +/- 10%	
Power consumption	Maximum 50mA @ 24VDC	
Signal output	4-20mA	
Digital communications	RS485 Modbus protocol. Multiple devices can be connected in a linear series	
Electrical interface	M12 x 1.5 connection	
Cable length	1 metre (as standard) / 3 metres / 10 metres	
Mechanical Specifications		
Dimensions	47mm Diameter x 120mm to 140mm depending on connection type	
Weight	0.260kg	
Wetted materials	Aluminium, PTFE, Viton	
Process connection	Flowthrough base with 1/8" NPT (parallel thread) / KF40 Flange	
Ingress protection	IP 66	
Housing material	Anodised aluminium	
Certification		
Complies with EMC Directive 2004 / 108 / EC. UL/ETL Certification Number: UL-61010-1		



\* Outputs can be factory set to other ranges. Please see order code sheet for details.

\*\* Exact range - 0 to 99.5%

## Ordering information

Model	Range (O <sub>2</sub> )	Sensor Type	Process Connection	Part No
SenzTx 101	0 - 25%	Zirconia: OC-71	Flowthrough	02-662
SenzTx 101	0 - 25%	Zirconia: OC-71	Flowthrough w/ Orifice	05-139
SenzTx 111	0 - 25%	Zirconia: OC-71	KF-40 Flange	04-068
SenzTx 201	0 - 25%	Electrochemical: OC-61	Flowthrough	04-072
SenzTx 201	0 - 25%	Electrochemical: OC-61	Flowthrough w/ Orifice	05-142
SenzTx 211	0 - 25%	Electrochemical: OC-61	KF-40 Flange	03-754
SenzTx 201	0 - 25%	Optical: Luminox	Flowthrough	06-414
SenzTx 201	0 - 25%	Optical: Luminox	Flowthrough w/ Orifice	06-415
SenzTx 211	0 - 25%	Optical: Luminox	KF-40 Flange	06-227
SenzTx 100	0 - 1000 PPM	Zirconia: OC-70	Flowthrough	02-661
SenzTx 100	0 - 1000 PPM	Zirconia: OC-70	Flowthrough w/ Orifice	05-138
SenzTx 110	0 - 1000 PPM	Zirconia: OC-70	KF-40 Flange	04-067
SenzTx 200	0 - 1000 PPM	Electrochemical: OC-62	Flowthrough	04-071
SenzTx 200	0 - 1000 PPM	Electrochemical: OC-62	Flowthrough w/ Orifice	05-141
SenzTx 210	0 - 1000 PPM	Electrochemical: OC-62	KF-40 Flange	03-753
SenzTx 200	0 - 1000 PPM	Optical: Luminox	Flowthrough	06-202
SenzTx 200	0 - 1000 PPM	Optical: Luminox	Flowthrough w/ Orifice	06-416
SenzTx 210	0 - 1000 PPM	Optical: Luminox	KF-40 Flange	06-147
SenzTx 102	0 - 96%	Zirconia: OC-72	Flowthrough	02-663
SenzTx 102	0 - 96%	Zirconia: OC-72	Flowthrough w/ Orifice	05-140
SenzTx 112	0 - 96%	Zirconia: OC-72	KF-40 Flange	04-069
SenzTx 102	0 - 100%	Zirconia: OC-72	Flowthrough	06-456
SenzTx 102	0 - 100%	Zirconia: OC-72	Flowthrough w/ Orifice	06-457
SenzTx 102	0 - 100%	Zirconia: OC-72	KF-40 Flange	06-458