AUSTRALIAN OXYTROL SYSTEMS

Industrial Carbon Probe

SIRO$_2$ ST Probe

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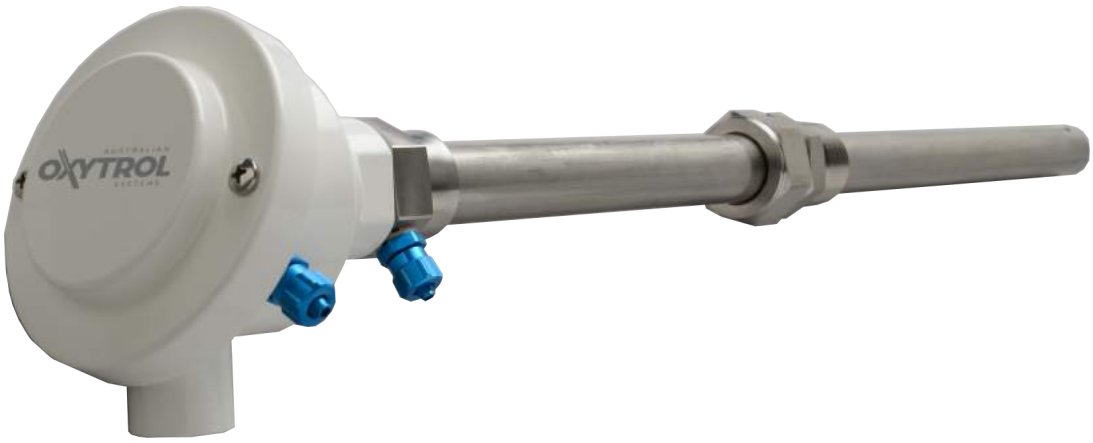
$SIRO_2$ ST Probe

1 Description



The ST carbon probe incorporates a $SIRO_2$ all ceramic oxygen sensor. The probe comes with a 25mm Inconel sheath for extended life and additional protection. It is used for measurement and control of oxygen sensitive environments at high temperatures. The sensor operates in situ, and measures oxygen concentration in real time, without the need for expensive gas sampling, or gas extraction equipment.

Features

- Specific for O_2
- High O_2 sensitivity and selectivity
- High dynamic range of detection
- High temperature of operation
- Rapid responses
- In situ measurement
- Solid state electronic component – rugged sensor
- No power consumed for operation under all conditions
- No bias required to operate
- Available up to 1350 mm

Applications

- Carburising (heat treating) furnace control
- Annealing furnaces
- CO_2 harsh environments
- Industrial applications
- Metal heat treatment processes

2 Specifications

Thermal				
Parameter	Minimum	Typical	Maximum	Unit
Operating temperature	700	950	1100	°C
Operating temperature	1292	1742	2012	°F
Control head operating temperature	—	60	80	°C
Ramp rate	—	—	400	°C/hour
Storage	5	20	80	°C
Electrical				
Parameter	Minimum	Typical	Maximum	Unit
Output voltage range	2.0	1130	1400††	mV @ T≥ 700 °C
Output impedance	1.00	2.00	10.00	kΩ @ T≥ 700 °C
Response time	10	20	10000	ms @ T ≥ 700 °C
Offset Error @ 700 °C **	0	±2	–	mV @ pO_2=pO_2′
Measurement Range				
Parameter	Minimum	Typical	Maximum	Unit
O_2 Atmosphere	10^{-24}	–	1	pO_2@ 700 °C
Reference air	1	10	20	mL/min
Gas Seal				
Parameter	Minimum	Typical	Maximum	Unit
Gas tight - pressure	–	1	2	atm
Gas tight - pressure	–	100	200	kPa
Sheath Mechanical Inconel 600				
Parameter	Minimum	Typical	Maximum	Unit
Outer Diameter	-	25.0	-	mm
Probe length	650	–	1350	mm ±3 mm
Weight	1	–	5	kg
Electrical Connections				
Description	Pin No	Type	Wiring (internal)	
Thermocouple positive leg	1	Output	Black (thermocouple +)	
Thermocouple negative leg	2	Output	Red (thermocouple —)	
Sensor internal (reference) connection	3	Output	Blue (O_2, sense-reference)	
Sensor external (sense) connection	4	Output	Grey (O_2, sense-chamber)	
Connector				
Mating connector	Manufacturer	Part Number		
4 Pin male XLR	Switchcraft	QG4M		

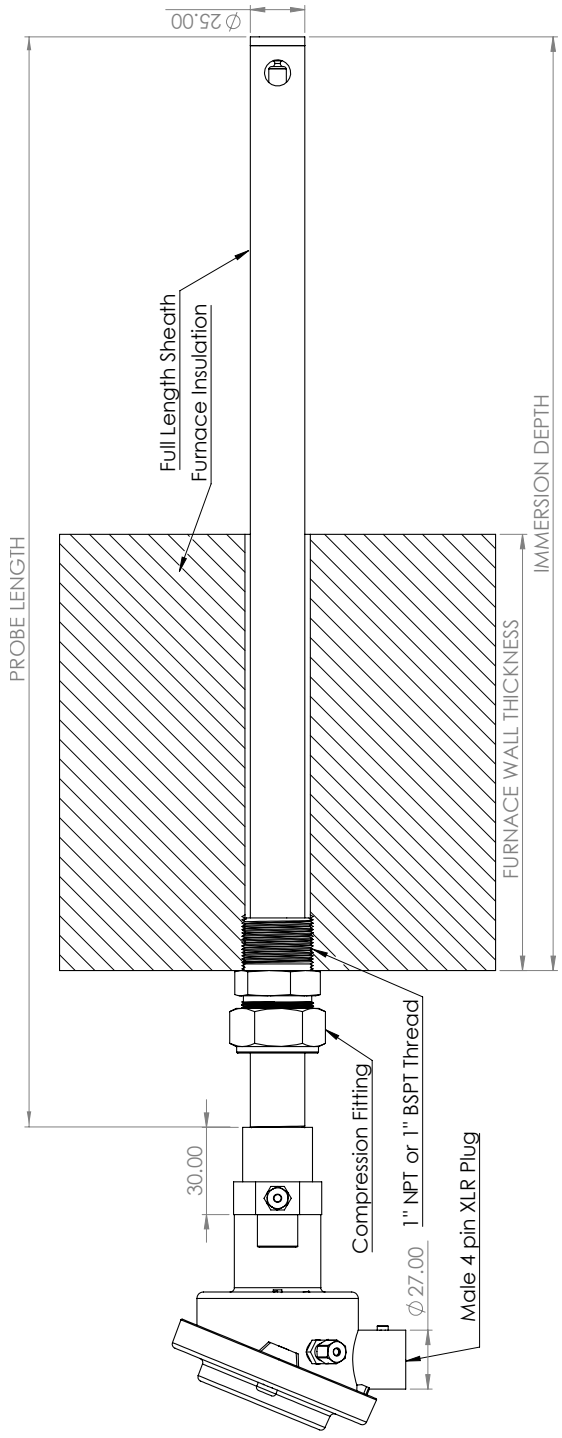
†† Under some conditions, an output voltage of 1650 mV may be observed.
** Offset error should be subtracted from the voltage reading during measurements for high accuracy applications. Also, note that this offset value is temperature dependent.

The sensor within a probe can be installed anywhere in the kiln or furnace if used at temperatures below 1093°C.

3 Installation

The ST probe must not be handled by the probe head.

The sheathed ST probe must be handled by the Inconel sheath with no weight or force applied to the head assembly. Two hands should be applied at the quarter mid-points of the sheath. Carefully insert the probe into the furnace aperture. Once the probe has been inserted the instrument interface cable and reference air may then be connected. The ST-1200-R-BSPT is shown below installed into a furnace having a wall thickness of 750 mm.



4 Ordering information

When ordering the following information will need to be specified:

- The Probe length.
- The Thermocouple type.
- The required thread type.

The ST probe part number has the following format.

ST - 1000 - R - NPT

Thread type	**NPT** for a compression fitting with a 1" NPT Thread **BSPT** for a compression fitting with a 1" BSPT Thread
Thermocouple	**R** for R-type thermocouple (870 - 1450°C) **K** for K-type thermocouple (95 - 1260°C) **S** for S-type thermocouple (980 - 1450°C)
Probe length	**0650** for 650 mm **0750** for 750 mm **0850** for 850 mm **1000** for 1000 mm **1200** for 1200 mm **1350** for 1350 mm

Part Number Examples

ST-0650-R-NPT would be 650mm in length, use an R-type thermocouple and have a compression fitting with a 1" NPT Thread

ST-1000-S-BSPT would be 1000mm in length, use an S-type thermocouple, and have a compression fitting with a 1" BSPT Thread

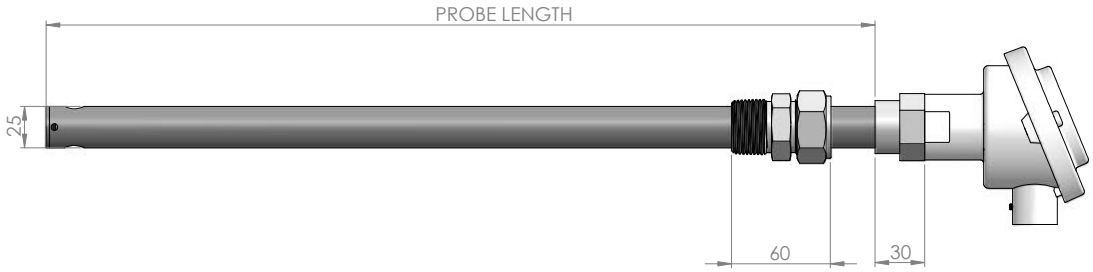
ST-1350-K-NPT would be 1350mm in length, use a K-type thermocouple, and have a compression fitting with a 1" NPT Thread

5 Probe Length guide

Probe Lengths are specified from the end of the Probe head to the end of the sheath. These probes can be ordered in a range of different sizes from 650mm to 1350mm. The following lengths are standard:

- 650mm
- 750mm
- 850mm
- 1000mm
- 1200mm
- 1350mm

Custom lengths are available.
All probes come with a 4 pin XLR connector.



All measurements in mm unless otherwise noted.

6 Contact information

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