Oxygen Sensor

Mini Oxygen Sensor

SO-B0-xxx (TO-8 for through hole mounting on a PCB)

SO-B0-xxx-DxxxC (TO-8 with 6 pol cable and RAST 2.5 connector)

- Measurement ranges from 10 ppm to 96% oxygen
- Stable Sensor characteristic across range
- Sensor signal not affected by temperature
- Zirconium Dioxide (ZrO2) technology

Description

The Sensore SO-B0 series delivers accurate oxygen measurement from ppm to percent levels in a compact design. Using proven zirconium dioxide technology, these sensors provide long life and stable performance with minimal impact from temperature, pressure, or interfering gases.

Specifications

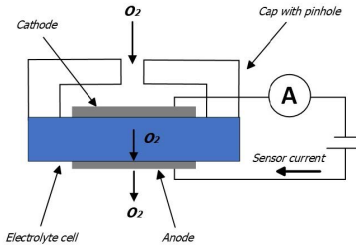
Sensor technology	
Measuring Gas	Oxygen (O_2)
Measuring Principle:	Limiting current, ZrO2-cell
Sensor cell	
Bias voltage:	0.7...1.6 V_{DC}
Resulting sensor current	0...250 µA 0...420 µA (96 % measurement range)
Sensor heater (platinum heater element)	
Basic heater operation	Constant heater voltage
Warm up procedure	30 seconds heater voltage ramp-up or heater current limitation <0.5 A
Constant heater voltage	3.6 VDC (depends on application)
Power consumption	1.5 W (depends on application)
Heater resistance at 25°C	3.25 Ω ± 0.25 Ω
Advanced heater operation	Active heater resistance control
Environmental conditions	
Maximum operating temperature	350 °C (with-out cable) 125 °C (with cable)
Humidity	non-condensing (max. 90 % r.h. @ 40 °C)
Pressure range*	700-1300 mbar (absolute)
***Contact SENSORE for extended pressure range options**	
Reliability data under clean laboratory conditions	
Lifetime (MTTF)	typical 10 years
Calibration stability (MTTF)	typical 20 000 hours
Vibration resistance	sensors meet the European Norm EN60068-2-6 (Sinusoidal vibration tests)

Housing and gas interface	
Type	SO-B0
Housing description	TO8
Dimensions **see also next page**	TO-8: Ø 15.3 mm, height = 13.7 mm
Housing temperature during operation	70 °C (at ambient temperature of 25°C)
Gas exchange	Gas diffusion through mesh on top
Response time (t90)	< 12 seconds
Flow rate	Usually there is no convection flow in a B0 housing. Exposure to massive airflows might affect the sensor performance.
Part number ordering information	
Sensor part number	**Measuring range**
SO-B0-001	10 ppm O_2 – 1000 ppm O_2
SO-B0-010	0.01 % O_2 – 1.0 % O_2
SO-B0-020	0.01 % O_2 – 2.0 % O_2
SO-B0-050	0.05 % O_2 – 5.0 % O_2
SO-B0-250	0.10 % O_2 – 25.0 % O_2
SO-B0-960	1.00 % O_2 – 96.0 % O_2
***Operation outside the specified measuring range can cause a permanent damage of the electrode**	
Optional cable number	
SO-B0-xxx	no cable, TO-8 for through hole mount
SO-B0-xxx-D012C	12cm cable, 6 pole, Rast 2.5 connector
SO-B0-xxx-D040C	40cm cable, 6 pole, Rast 2.5 connector

Sensor specification for different O2 measurement ranges with N2 balance

Sensor part number	Measuring range*	Output current at O2 concentration	Accuracy	Reproducibility	Bias voltage
SO-BO-001	10 ppm O_2 - 1000 ppm O_2	150 – 250 µA at 1000 ppm O_2	± 20 ppm O_2	< 10 ppm O_2	0.70 V_{DC}
SO-BO-010	0.01 % O2 – 1.0 % O2	150 – 250 µA at 1.0 % O_2	± 100 ppm O_2	< 100 ppm O_2	0.75 V_{DC}
SO-BO-020	0.01 % O2 – 2.0 % O2	150 – 250 µA at 2.0 % O_2	± 200 ppm O_2	< 100 ppm O_2	0.75 V_{DC}
SO-BO-050	0.05 % O2 – 5.0 % O2	150 – 250 µA at 5.0 % O_2	± 500 ppm O_2	< 250 ppm O_2	0.80 V_{DC}
SO-BO-250	0.10 % O2 – 25.0 % O2	100 – 200 µA at 20.9 % O_2	± 0.25 % O_2	< 0.1 % O_2	0.85 V_{DC}
SO-BO-960	1.00 % O2 – 96.0 % O2	15 – 30 µA at 20.9 % O_2	± 1.00 % O_2	< 0.2 % O_2	1.00 V_{DC}**
Operation outside the specified measuring range can cause a permanent damage of the electrode ** If the sensor is mainly operated between 70 and 96.0% O_2 bias voltages up to 1.6 VDC can be applied					

Sensor principle



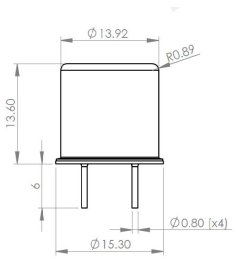
Sensor characteristic

Sensor Characteristic	
$Is\,(O_2) = -k \cdot \ln\left(1 - \frac{[O_2]}{100}\right)$	Is (O_2) Sensor current in µA [O_2] Oxygen concentration in % k specific constant of sensor

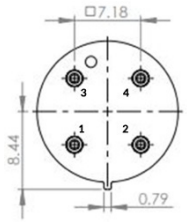
Pin layout

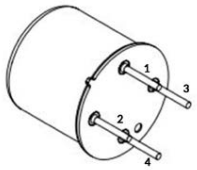
Nr	Function	6 pole cable
1	Heater H+ HS+ (sense)	violet 1 violet 2
2	Heater H- HS- (sense)	white 1 white 2
3	Sensor S+	red
4	Sensor S-	black

Standard housing TO8 (Type SO-BO-xxx)



Pin-Side View





For electronics control board option see Datasheet "GSB- Generic Sensor Board"
Generic Sensor Board (GSB) provides a standard connection for board (solder) or cable mount sensors.
Power supply: 12V_{DC} 0.5 A. Linear signal outputs: 0-5V_{DC}, 4-20 mA and digital RS232 outputs.

Customers should test under their own conditions to ensure the equipment is suitable for the intended application(s).
We adopt a continuous development program, which sometimes necessitates specification changes without notice.

Improving the world, one measurement at a time™

Sensore Electronic GmbH Aufeldgasse 37-39 A-3400 Klosterneuburg, Austria, Tel: +43 2243 450-0 I email: sensors@dwyeromega.com