

# Oxygen Optode 4831W/4831/4831F



The Oxygen Optode 4831 is a compact fully integrated sensor for measuring O<sub>2</sub> concentration and temperature. 4831W is equipped with ultra-stable foil FDO701, while 4831F is equipped with fast response sensing foil Pst3 (See Sensing Foil Considerations overleaf).

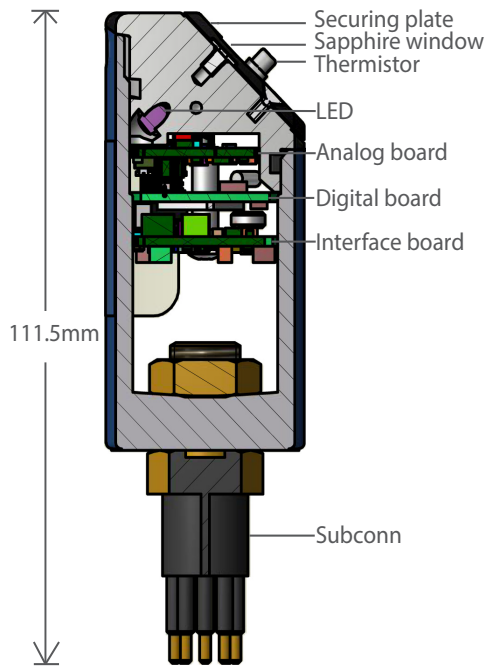
- Optical lifetime-based luminescence quenching measurement principle
- Multipoint calibrated in 40 points
- Long time stability with pre-burned foil and red reference LED
- Low maintenance needs
- Not stirring sensitive (it consumes no oxygen)
- User friendly
- Small size and weight
- Stand-alone sensor
- Output format: RS232 and analog 0-5V
- Three depth ranges, maximum 12000 meter

The Aanderaa Oxygen Optodes were the first to measure dissolved oxygen for years with low drift and high accuracy. By introducing the FDO701 foil on our deepwater sensors, the drift and pressure effects becomes a factor of two lower. Aanderaa Oxygen Sensor is designed to measure absolute oxygen concentration and % saturation. The oxygen optodes are used from streams to deep sea, from Aquaculture to Waste water and from Polar ice areas to Hydrothermal vents. The lifetime-based luminescence quenching principle offers a list of benefits. More than 200 scientific papers have so far been published using Aanderaa optodes.

**AANDERAA**

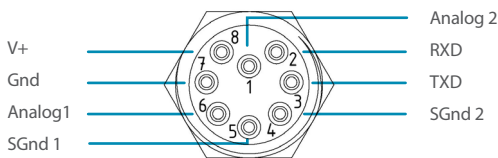
a xylem brand

# Specifications OXYGEN OPTODE 4831W/4831/4831F



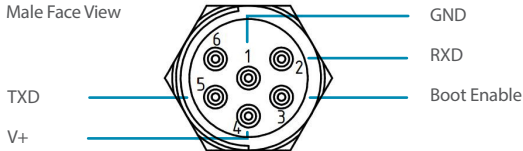
## PIN CONFIGURATION SUBCONN MCBH8

Male Face View



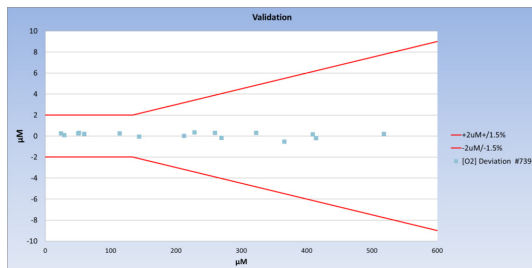
## PIN CONFIGURATION SUBCONN MCBH6

Male Face View



## Sensing Foil Considerations

The Pst3 & FDO701 sensing foils are protected by an optical isolation layer which makes the foil extra rugged and insensitive to direct sunlight. The fast response sensing foil is not equipped with this layer; ambient light intensity higher than 15000 lux may cause erroneous readings. We recommend the more rugged and stable FDO701 foil in applications where fast response is not needed.



Typical validation in 20 points after calibration

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## Technical Details

Oxygen: Measurement Range:	O <sub>2</sub> - Concentration 0 – 1000 µM <sup>(1)</sup> or 0-32 mg/L	Air Saturation 0 - 300%
Calibration method:	40-point automatic calibration, 20-point verification, 3 fully Winkler calibrated optodes for referencing	
Sensing Foils:	Pre-burned PreSens Pst3 foils Pre-burned Xylem FDO701 foils Fast Response Foil 0 – 500 µM <sup>(2)</sup> or 0-16 mg/L < 0.1 µM <sup>(3)</sup> or 0.0032 mg/L < 2 µM or 0.064 mg/L <sup>(4)</sup>	0 - 120% 0.05 % <1.5 % <sup>(5)</sup>
Calibration Range:		0 - 120%
Resolution:		0.05 %
Accuracy:		<1.5 % <sup>(5)</sup>
Response Time (63%):	(with fast response foil) (with standard foil) (with FDO701 foil)	<8 sec <25 sec <30 sec
4831F		
4831		
4831W		
Typical field drift:	<0.5 % per year	
Pst3 foil	<0.2 % per year, no dry out effects	
FDO701 foil		
Pressure effects:		
Pst3 & Pst3Fast foils	3-4 % lower per 1000 m	
FDO701 foil	1.5 - 2 % lower per 1000 m	
Foil Lifetime:	+10 years, do not change foil unless mechanically damaged.	
Temperature:		
Range:	-5 to +40°C (23-104°F)	
Resolution:	0.01°C (0.018°F)	
Accuracy:	±0.03°C (0.054°F) <sup>(6)</sup>	
Typical field drift:	< 0.03 degC per year	
Response Time (63%):	<2 sec	
Output format:	RS-232, 0-5V	
Output Parameters:		
RS-232	O <sub>2</sub> Concentration in µM and mg/L, Air Saturation in %, Temperature in °C, Oxygen raw data and Temperature raw data	
Analog channel 1:	O <sub>2</sub> Concentration in µM, or Air Saturation in %	
Analog channel 2:	Temperature in °C	
Sampling interval:	1 sec – 255 min	
Supply voltage:	5 to 14VDC, 7 to 14VDC for analog output	
Current drain:		
Average:	0.16 +48mA/S where S is sampling interval in seconds	
Maximum:	100mA	
Quiescent:	0.16mA	
Operating depth:		
Intermediate Water (IW) <sup>(7)</sup> :	0–3000m (0–9843ft)	
Deep Water (DW) <sup>(7)</sup> :	0–6000m (0–19690ft)	
Hadal <sup>(8)</sup> :	0-12000m (0-39,380ft)	
Electrical connection:		
4831U:	8 pin Subconn MCBH8M	
4831F:	6 pin Subconn MCBH6M	
Dimension (WxDxH):	Ø36 x 111.5mm (Ø1.4" x 4.4")	
Weight:	217g (7.65oz)	
Materials:	Epoxy coated titanium, PA	
Accessories not included:	Foil Service Kit 4733/4733O (Pst3 standard) Foil Service Kit 4794 (Pst3 fast) Foil Service Kit 5551 (FDO701) Setup and configuration cable 5335 <sup>(9)</sup> /5335F <sup>(9)</sup>	

(1) O<sub>2</sub> concentration in µM = µmol/L.  
To obtain mg/l, divide by 31.25  
(2) Other ranges available on request.  
(3) FDO701 foils have 0.02 µM resolution at low concentrations.  
(4) Requires salinity compensation for salinity variations > 1mS/cm, and pressure compensation for pressure > 100meter

(5) Within calibrated range 0 - 120% / 0 - 30°C  
(6) Within calibrated range 0 - 30°C. Enhanced calibration 0.003°C accuracy available for additional costs  
(7) Pressure cycled five times to rated depth.  
(8) Product number 5331  
(9) Laboratory use only

The above specifications are for the stand-alone sensor only, not the installation it is utilized with.

## Misleading specifications

When Aanderaa states an absolute accuracy of e.g. (±1.5% or ±2 µM) we mean the accuracy of the sensor in the field over the entire range of oxygen concentrations and temperatures, others might refer to accuracy in the laboratory just after the sensor was calibrated. When Aanderaa give response time in water others refer to response time in air which is much faster. For more information read our [Best Practice document](#) on Oxygen Optodes.



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