Thermo Scientific Orion 1816DO Dissolved Oxygen Analyzer

Low and trace level parts per billion measurement

Our dissolved oxygen instruments are best suited for your most challenging low and trace level ppb applications. Versatile and easy-to-use, our Thermo Scientific™ Orion™ 1816DO analyzer offers unbeatable response with the highest accuracy available.

Markets:

- Power
- Pulp and Paper
- Chemical Processing

Applications:

- Boiler Feed Water
- Ultra Pure Water
- Process Steam
- Deaerator Outlet
- Condensate
- Oxygen Feed Control for Plants Using Oxygenated Treatment (OT)

The Orion 1816DO low level dissolved oxygen analyzer is designed to continuously analyze the oxygen across a wide variety of low and trace level ppb level applications. Highly accurate measurement performance with proven reliability, the 1816DO analyzer offers effective process control you can trust.

Our rugged and sensitive galvanic dissolved oxygen sensor with rapid response offers high performance results with confidence. The galvanic dissolved oxygen sensor incorporates unique “Guard Ring” technology that is capable of consuming oxygen and associated gases. Trace oxygen detection has never been easier with the pre-assembled, screw-on, bonded Teflon® membrane caps for sensor refurbishment in minutes, returning your system quickly to sub ppb range measurements, optimal for critical applications.

Advantages:

- Measures low level dissolved oxygen within ± 0.1 ppb
- Stable, drift resistance readings provide months of reliable measurements
- Easy to install screw-on pre-bonded Teflon membrane cap for fast replacement in minutes
- Galvanic probe technology with absolute zero oxygen ensures the most accurate low range dissolved oxygen readings
- One-button automatic calibration is quick and simple
- Advanced diagnostics include fault tolerance and dual programmable alarms with self and sensor diagnostic alert

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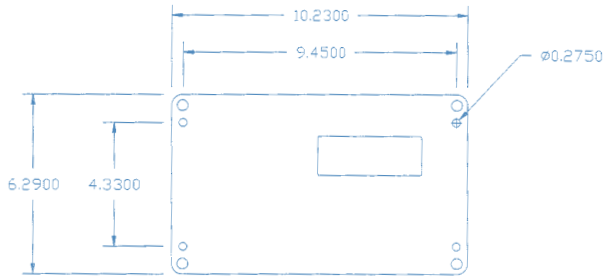
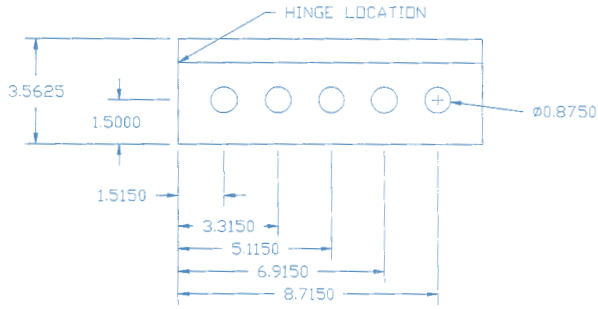
Product Benefits

- "Absolute zero", less drift and better stability — the 1816DO analyzer offers continuous high accuracy dissolved oxygen analysis in critical steam loops
- Galvanic sensor speed of response allows sensitive, selective, reliable and verifiable measurements with complete assurance below 1 ppb
- Sensors unique "Guard Ring" eliminates dissolved oxygen in the electrolyte to prevent false high readings and returns to low ppb range quickly every time
- Extremely easy to use while maximizing uptime — simple automatic calibration with less maintenance using the quick screw pre-assembled Teflon membrane caps has you back online in less than 5 minutes
- Cell chemistry regenerates the electrolyte, thus optimizing sensor life and extends the required maintenance cycle by years
- High quality stainless steel flow cell design to prevent oxygen ingress with double shielded ppb dissolved oxygen sensor produces stable sub-ppb readings without "charging" as with other sensors
- The 1816DO provides 1000 running data points for rapid trend analysis, true auto-ranging performance combined with 3 advanced levels of security to provide confidence and protect your data's integrity
- Easy installation of the analyzer and stainless steel fluidics panel has your plant up and running in minutes with results you can see



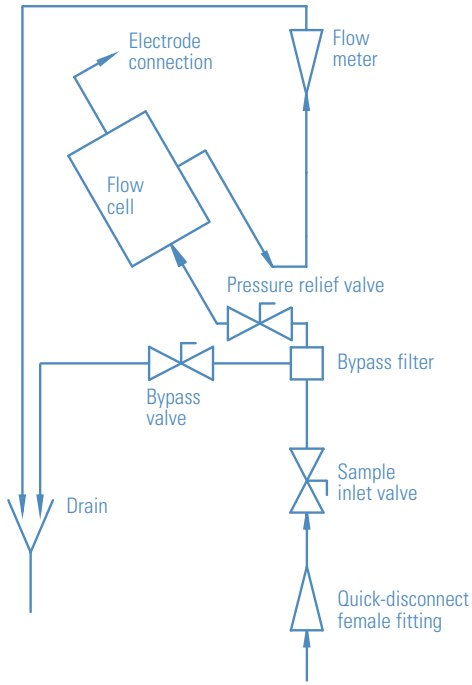
Front view



Bottom view

Sample Panel Features

- Robust stainless steel panel for fast installation
- ppb dissolved oxygen sensor with guard ring for optimum response
- Stainless steel flow cell
- Double-shielded sensor cable for stable readings
- Online automatic calibration
- Magnetite grit bypass
- Siphon-drain system



Dissolved Oxygen Fluidics Panel

Diagram of Sample Flow

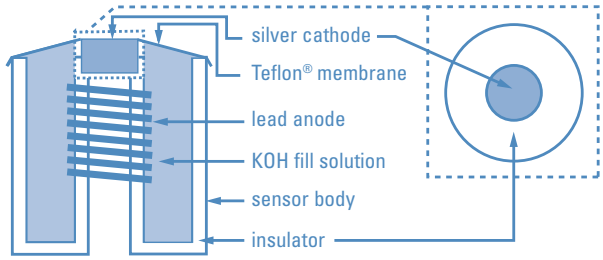
Product Specifications

Accuracy	Dissolved Oxygen: ± 2% reading or 0.1 µg/L, whichever is greater Temperature: ± 0.1 °C
Precision	Dissolved Oxygen: ± 2% reading or 2 digits Temperature: ± 0.1 °C
Response Time	90% within 30 sec (default), function of flow and temperature
Temperature Compensation	Auto: -5.0 ˚C to 105 ˚C (23.0 ˚F to 221 ˚F) Manual: -5.0 ˚C to 105 ˚C (23.0 ˚F to 221 ˚F)
Sample Conditions	Flow: 50 mL/min to 200 mL/min Temperature: 2 ˚C to 45 ˚C (35.0 ˚F to 113 ˚F) w/ standard DO Pressure: <400 kPa (60 psi, 4 bar) Drain: Atmospheric
Sample Inlet	1/4 in NPT tube fitting
Sample Outlet	3/4 in MNPT fitting
Security	3 access-level security; partial and/or all settings may be protected via 3 and/or 4 digit security.
Alarms	Two independent, assignable, programmable, configurable, failsafe NO/NC or auto-range BCD alarm relays; SPDT, Form C, rated 10A 115V/5A 230V, 5 position BCD contact closure.
Outputs	Two continuous, assignable, programmable 4 mA to 20 mA or 0 mA to 20 mA outputs; isolated, max. load 600 Ω; convertible from VDC to VDC or 0 VDC to 5 VDC.
Display	Four and one half LCD digits, 2.0 cm (0.8 in) displays for dissolved oxygen, atmospheric pressure, temperature, efficiency, error codes, prompts and diagnostic information (back-lit display optional)
Display Ranges	Dissolved Oxygen: 0.00 mg/L to 10.00 mg/L or 0.01 µg/L to 9,999 µg/L Temperature: -5.0 ˚C to 105 ˚C (23.0 ˚F to 221 ˚F) Barometric Pressure: 72 to 130 kPa
Keypad	8 push-button entry keys
LEDs	2 alarms (A and B), 1 auto, 1 error
Case Dimensions	16.0 cm (H) x 26.0 cm (W) x 9.0 cm (D) 6.3 in (H) x 10.2 in (W) x 3.5 in (D)
Panel Dimensions	36 cm (W) x 66 cm (H) 14 in (W) x 26 in (H)
Weight	11.4 kg (25.0 lb)
Shipping Weight	13.6 kg (30.0 lb)
Shipping Dimensions	71 cm x 41 cm x 20 cm 28 in x 16 in 8 in
Environmental Data	
Temperature	Operational: 5.0˚ C to 45 ˚C (41.0 ˚F to 113 ˚F) Storage: -10.0 ˚C to 55 ˚C (14.0 ˚F to 131 ˚F) Relative Humidity: 5.0 ˚C to 45 ˚C (41.0 ˚F to 113 ˚F)
Environment Ratings	Housing: IP65 (Nema 4X) Pollution Category: II Installation Category: 2
Electrical Ratings	115/230 VAC, 0.25A, 50/60 Hz
Electrical Requirements	115/230 VAC ±10%, 50 W
Certifications	CSA C22.2 1010.1-92 (eqv. IEC 1010.1 LR 109591-3 UL Std No 3111-1; CE EN50081, EN55011; EN61000

Measurement Range	0.01 µg/L to 9,999 µg/L
Minimum Temperature	2 ˚C (35 ˚F)
Maximum Temperature	45 ˚C (113 ˚F)
Maximum Pressure	400 kPa (60 psi)
Principle of Operation	Galvanic
Electrode Materials	Cathode: Silver Anode: Lead
Wetted Materials	Stainless, PTFE, Viton, Delrin
Temperature Sensor	1000 Ω PT RTD
Optimal Flow Velocity	0.83 cm3/sec to 3.3 cm3/sec (50 mL/min to 200 mL/min)
Electrode Dimensions	Diameter: 3.2 cm (1.3 in) Length: 10.1 cm (4.0 in)
Process Connections	Flow cell; insertion via 1.25 in Swagelok® nut
Sensor Cable	Double shielded; 1 meter length
Weight	0.5 kg (1.0 lb)
Shipping Weight	1.4 kg (3.0 lb)
Shipping Dimensions	46 cm x 30 cm x 23 cm (18 in x 12 in x 9 in)

Specifications data generated under optimal/controlled circumstances

Cross-section of Probe Sensor



Product Ordering Information

Orion 1816DO Dissolved Oxygen Analyzer

Global support — with experience that comes from supporting our customers for over 35 years throughout the world, our water quality specialists and customer support teams offer a quick, thorough and professional response to any problem encountered.

Focus on user benefits — we work closely with you to define your needs, and ensure you are using the analyzer in a way that improves your bottom line. For more information, contact your local water quality specialists, call 1-800-225-1480 or visit www.thermoscientific.com/processwater.

Cat. No.	Dissolved Oxygen Analyzer Packages
1816DO	Low-level dissolved oxygen analyzer, complete with stainless steel flow cell (223115-S01), maintenance kit (181622), dissolved oxygen probe (181621) and 10 foot shielded cable, 115/230 V
18116D2	Low-level dissolved oxygen analyzer only, 115/230 V (does not include probe or flow cell)
1816FP*	316 stainless steel fluidics panel for online calibration, includes inlet valve, magnetite grit bypass, atmospheric pressure relief and grab sample chamber, flow cell outlet and siphon drain system
181621	Low-level dissolved oxygen probe with 10 foot shielded cable
18162X	Low-level dissolved oxygen probe with customized cable length, up to a 30 foot shielded cable (customer must specify at time of order)
181622	Maintenance kit, includes membrane module, O-ring and probe electrolyte solution
223115-S01	316 stainless steel flow cell only
223119-S01	Micro display board
223120-S01	Power board
223121-S01	Cable, interboard connector

* Note: The 1816DO image is shown with the 1816FP fluidics panel. The 1816DO requires purchase of the 1816FP.

Certified System

Thermo Fisher Scientific
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Chelmsford, MA USA
Quality Management System
Registered to ISO 9001

thermoscientific.com/processwater

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