

Highlights

No zero adjustment of any kind is ever needed

Versatile Mounting:

- 3/4" x 3/4" MNPT for inline, immersion or submersible installations.
- Quick disconnect Twist Lock 1" MNPT inline mounting
- Tri-Clover sanitary mounting for food, beverage & pharmaceutical use.
- Valve retractable mount with 316SS Hot-Tap hardware

No look-up tables or solutions needed to calibrate

Temperature Element:

Auto compensation with PT1000 element; also used to compute % saturation at current temperature

Measuring Range:

0-4 to 0-40.0ppm (0-40% to 0-400% saturation) or 0-6 to 0-60.0ppm (0-60% to 0-600% saturation) optionally

Cable Length:

10-ft standard, 50-ft max. without preamplifier.
330 feet with preamplifier using NEMA 6P snap connector extension cables, optional waterproofing with rigid PVC jacket and sealing

Made in America



FX-300-DO Dissolved Oxygen Transmitter



The Foxcroft FX-300-DO uses a proven membrane covered self-polarizing style galvanic cell that generates a low-impedance millivolt electrical signal proportional to the oxygen pressure it senses.

The cost is dramatically lower than optical DO systems: commissioning costs are often less than 1/3 that of optical sensor systems, while the cost of ownership is often less than 1/5 the cost of optical sensors.

Extremely rugged sensors give you continuous measurement of dissolved oxygen in tough process applications such as abrasive slurries, high levels of organic & biological content, high turbidity likely to foul luminescent type DO sensors.

The unique electrolyte and design combined with a thick Teflon™ (PTFE) membrane yields highly stable readings with minimal calibration, cleaning & rebuilding cell.

Measure from 0-4 to 0-40.0ppm (0-40% to 0-400% saturation) or 0-6 to 0-60.0ppm (0-60% to 0-600% saturation) optionally.

Display and output dissolved oxygen levels in ppm and percent (%) saturation units plus temperature in °C via both analog 4-20mA and optional RS485 MODbus RTU.

Calibrations and process readings are automatically corrected for temperature, air pressure and salinity.

Automatic calibration mode reads the mV potential and assigns the correct span (slope) millivolt per ppm response for the sensor. You can also calibrate manually.

With an absolute zero point, you only need to calibrate the span while the sensor is dry in air. *No calibration solutions are ever needed.*

No look up tables are required: the transmitter calculates the ppm value that's associated with the 100% saturated dry in air condition used for calibration at the temperature measured by the sensor, along with user inputted atmospheric pressure.

FX-300-DO Dissolved Oxygen Transmitter and Sensor Specifications

SPECIFICATIONS: FX-300-DO Dissolved Oxygen Analyzer/Transmitter/Controller

Measurement Type and Purpose:	Galvanic (active self-polarizing) dissolved oxygen sensor to measure DO levels in aqueous media, internally self temperature compensating (even without integrated TC element)
Typical Applications for the AST-DO-UNIVERSAL Galvanic Dissolved Oxygen Sensors:	Industrial & mining abrasive slurries as well as any solution with high turbidity. Ideal for high sulfide containing media since the FX-300-DO sensor is insensitive to hydrogen sulfide gas. Any measurement where rugged process conditions may exist.
Concentration Range Standard:	0.0 to 40.0 ppm or 0 to 400% saturation is the standard full range
Concentration Range Special:	0.0 to 60.0 ppm or 0 to 600% saturation ranges available as a special order option
Resolution:	0.01mV and 0.01 ppm absolute anywhere in the range
Output Scaling:	Minimum 10% of full range for both analog current loop & MODbus. The 4mA & 20mA setpoints can be arbitrarily defined and are fully reversible
Lowest Displayed Limit of Detection:	0.01 ppm (Recommended for applications that are typically 0.10ppm or higher)
Sample pH Range:	Typically 2 to 12 (Inquire for other pH levels outside of this range)
Sample Temperature Range:	0 to +50 °C (+32 to +122 °F)
Pressure Range:	Typical inline installations are 10 psig or less; Submersible to 50 meters (165 feet)
Sample Flow Requirements:	Continuous flow, Minimum 1cm per second for stable readings
FX-300-DO Industrial Galvanic Dissolved Oxygen Sensor Specifications:	Membrane covered galvanic cell generates an internally temperature compensated mV signal linear to dissolved oxygen in air or liquid. Typical response is 1 to 5 mV per ppm as is determined from dry in air slope (span) calibration. Measurement range is 0-600% saturation.
Special Features:	Corrects for temperature, pressure and salinity effects on % saturation in calibration and measurement modes; More details are provided on the following pages
Display:	Bright 3-digit red LED display visible in sunlight
Power Supply:	CSA/UL/CE Universal 100 to 240 VAC power supply, consumption 60mA max per module
Signal Output:	Scalable 4-20 mA; DO ppm, % Saturation & Temperature all sent on optional RS485 MODbus
Instrument Mounting & Dimensions:	Wall, Pipe or Panel Mounting for 1 to 5 modules per enclosure (NEMA 4X CSA/UL)

FX-300-DO Dissolved Oxygen Transmitter and Sensor Specifications

Module Description & Options:

Transmitter Modules: In addition to dissolved oxygen, modules are available for pH, ORP, mV, Temperature, Conductivity and Ion Selective (ISE) measurements including Fluoride, Ammonia, Nitrite, Nitrate & Calcium among others. All analog outputs have built-in trim calibration support, including both offset and span adjustments. Calibration of temperature element is available for all measurement modules via 1-point offset adjustment.

Preamplifier Support: Unlike many low cost systems, the FX-300-pH and FX-300-ISE transmitter series supports optional external preamplifiers for noisy environments or to avoid opening the analyzer enclosure for sensor service, and to minimize sensor replacement costs (no long cables need be pulled).

FX-300-REL Option: Alarm and relay controller module provides (2) each 5 Amp contact relays and controller that is fully configurable by the user for control mode and variables for each control algorithm. Control modes include: 1) Alarm functions only; 2) On/Off control with a user-configurable dead band; 3) Time proportional control; and 4) Proportional frequency control (variable pulse controller).

FX-300-DAT Data Logging Option: MODbus FX-300-DAT data logger can support simultaneously data logging from any FX-300 module with MODbus output (FX-300-pH, FX-300-ISE, FX-300-DO, FX-300-CON and FX-300-TOT) at frequencies from every second to every hour. Configuration of FX-300-DAT data logger and downloading of data done via free Windows PC software.

FX-300-TOT Option: pH compensation module computes total ISE using the free ion activity, pH, and temperature from the respective measurement modules' bridged outputs. The FX-300-TOT module includes a scalable 4-20mA output for total ammonia result and RS485 Modbus communications for all inputs and outputs. By using the bridged output for totalizing, you retain the use of free ion and pH 4-20mA outputs.

Modbus Option: Available as RS-485 output option for measurement module or by adding FX-300-TOT module at any time. Free of charge Windows Graphing & Data logging software supplied with all FX-300 modules purchased with MODbus output option or FX-300-TOT.

Enclosure: Wall Mount IP65/NEMA 4X polycarbonate enclosure, 180mm (7") H x 110mm (4.3") D x 182mm (7.16") or 254mm (10") wide.

FX-300-DO Galvanic Sensor Specifications

Measurement Range: 0-600 percent (%) saturation, 0-60 ppm range (Lowest Limit 0.1ppm) *

Operating Temperature: -5 to +50 °C (+23 to +122 °F)

Convertible 3/4"-3/4" MNPT Configuration Installation Styles: Inline, Immersion or Submersible with immersion tube or waterproofing option installed

Twist Lock Configuration Installation Styles: Inline with 1" MNPT Twist Lock Receptacle
Immersion or Submersible with immersion tube or waterproofing option installed on rear 1" MNPT threads

Sanitary/HOT-TAP Configuration Installation Styles: Inline with mating 316SS sanitary tri-clover sensor holder,
Valve retractable when used with mating 316SS HOT-TAP hardware assembly,
Immersion or Submersible (with immersion tube or waterproofing option installed)

Temperature Element: Standard with Pt1000 temperature sensor

DO Measuring Cell Material of Construction: DELRIN® (Polyoxymethylene, POM)

Sensor Body Material of Construction: RYTON® R-4-230BL (Poly-Phenylene-Sulfone, PPS)

Cable Length Without Preamplifier: Standard 10 feet (3 meters), Max is 50 feet (15 meters)

Cable Length With Integral Preamplifier: Standard 10 feet (3 meters), Max is 330 feet (100 meters)

Measurement Principle: Galvanic cell, self polarizing (a.k.a. active type) & internally self temperature compensating

Signal Response Wetted in Solution: Slope (span) is 1mV to 5mV per DO ppm depending on exact conditions

Signal Response Dry in Air: Typically 10mV to 40mV depending on exact conditions

Signal Response Time: Typically 10 to 20 seconds near ambient (response time is temperature dependent)

FX-300-DO Galvanic Sensor Specifications cont'd

Signal Response Resolution: 1% saturation absolute

Signal Response Repeatability: Typically $\pm 1\%$ of actual measurement under the exact same conditions

Calibration: Slope (span) determined from automatic dry in air calibration. No zero calibration required for true galvanic DO cell.

Initial Impedance Without Preamplifier: < 2 MegaOhms @ 25°C

Initial Impedance With Preamplifier: < 2 KiloOhms @ 25°C

Flow Requirements, Water: Minimum flow dependent on DO and temperature, typically 1 cm/sec, suitable for most uses

Supplied With: 10 each spare thick high stability membranes with O-rings, 125 ml electrolyte filling solution, Tool for installation and removal of membranes from ring inside cap

** Contact factory if you plan to measure dissolved oxygen levels above 400% saturation or 40ppm prior to purchase.*



Twist lock style



Optional tip guard, left.

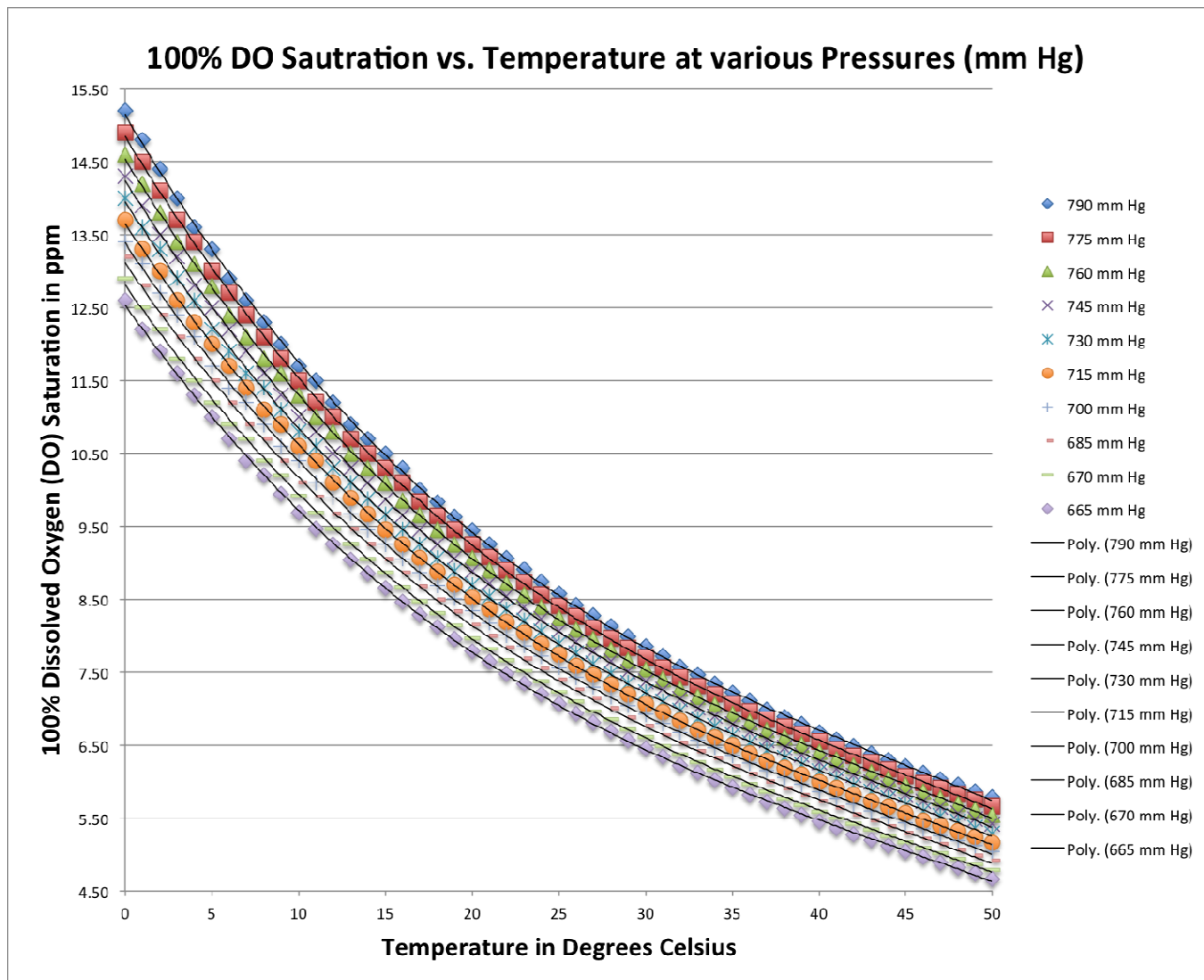


Submersible with snap connector cable extension above

FX-300-DO Galvanic Sensor Specifications cont'd

Automatic Calculation of Theoretical 100% Dissolved Oxygen Saturation At any Temperature & Pressure for Accurate Calibration & Measurement

The FX-300-DO has preprogrammed the correct 100% dissolved oxygen saturation levels valid at any temperature and pressure. This is important for two reasons: 1) to ensure accurate calibration of the sensor which is performed dry in air and 2) when the percent (%) saturation is displayed and output for purposes of monitoring and control. The graph below demonstrates the impact of both temperature and pressure on the dissolved oxygen (DO) ppm levels that constitute 100% saturation condition.



FX-300-DO Galvanic Sensor Specifications cont'd

For the calibration function, either the field condition should be 100% relative humidity for best accuracy or else the sensor should be suspended dry in air but over a water source to simulate locally the 100% relative humidity condition. The water molecule in air (humidity) is then saturated with oxygen in manner that can be fully described by the ambient temperature and pressure as shown above. When placed into service, the galvanic DO sensor will measure the ppm levels at the installation depth. To convert this measured ppm value into percent (%) saturation the FX-300-DO transmitter uses the stored curve visualization above.

Automatic Calculation of Theoretical 100% Dissolved Oxygen Saturation At any Temperature & Pressure for Accurate Calibration & Measurement

The FX-300-DO has preprogrammed the correct 100% dissolved oxygen saturation levels valid at not only any temperature and pressure but also corrected for salinity. This is important for application where not only fresh water will be present but also for brackish and salt water sources in variable amounts. The graph below demonstrates the impact of salinity on the dissolved oxygen (DO) ppm levels that constitute 100% saturation condition at the nominal 760mm pressure condition. For simplicity of visualization just one set of curves is shown although the analyzer can perform this compensation at any temperature, pressure or salinity.

