

Engineering Specifications

Oxygen measurement system Orbisphere 510

General

The dissolved oxygen analyzer shall consist of a transmitter, up to three electrochemical sensors and sampling devices.

The same analyzer can measure dissolved or gas phase oxygen for trace levels to saturation with user selectable units. The analyzer can measure radioactive samples and samples containing hydrogen.

The distance between the transmitter and the sensor can be up to 1000 m.

Enclosure

The transmitter shall have a IP65 certified enclosure in stainless steel for wall or pipe mounting or aluminum for panel mounting.

The transmitter shall be ISO 9001-2000 manufactured, and comply with CE directives: electromagnetic compatibility standards: EN 61326: A1 & A2 and safety standard: EN 61010-1.

Display

The analyzer shall have a color touch-screen display STN 320 x 240 pixels with CFL backlight

Display information

Main screen shall display simultaneously the oxygen concentration, the sample temperature, a trend graph over the last 60 minutes for three different measurement points. Information about the system status shall appear clearly on the main screen for system alarms, measurement alarms, or diagnostics information like calibration or service timer

Other display shall show diagnostics information or statistical data.

User interface

The analyzer shall have a color touch-screen user interface. Transmitter software shall be available in a minimum of five languages (English, French, German, Spanish and Italian).

Calibration modes

The analyzer shall have two calibration methods: in air or against a known sample. The instrument does not require a zero calibration.

The hydrogen effect on the electrochemical sensor shall be calibrated to correct for the presence of this gas on the oxygen measurement.

Calibration data

The analyzer shall have a calibration logbook, recording data of the last fifty calibrations.

Calibration records shall include date and time, operator name, operator ID, calibration mode, calibration coefficient, ratio with expected value, ratio with last calibration, signal stability, sensor current, temperature, barometric pressure

Security

The analyzer shall have four password protected access levels for system calibration, programming and servicing.

1000 user actions shall be stored for traceability tracking.

Alarms

The analyzer shall have 1 system alarm relay and 3 measurement relays by channel for oxygen concentration, temperature, barometric pressure.

Each measurement relay shall be configurable for standard alarm levels, but shall also be customizable to have diagnostics information on calibration and service requirements.

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Outputs

The analyzer shall have three isolated analog outputs per channel. The outputs shall be configured in 0-20 or 4-20 mA. They can be assigned to represent the measured oxygen concentration, temperature, or barometric pressure. The user shall be able to configure any data scaling in linear or tri-linear mode within the measuring range. Each output shall be configurable to report events such as calibration, calibration requirement, service requirement, thermal cutoff, any system or measurement alarm status.

The transmitter shall have two simulation possibilities of the analog outputs with current or measurement values.

Measurement data (oxygen concentration, temperature, and pressure), alarm status, and diagnostics information shall be sent continuously with RS485 or Profibus DP.

Stored measurement data, calibration reports, and user actions shall be retrievable through RS485, USB, and Ethernet.

Diagnostic tools

Diagnostics information including system status, measurement alarm, and calibration or service requirements shall be available on the screen, through the relays, through the analog output, through the RS485, and through the Profibus DP.

Oxygen sensor

The sensor shall have a dissolved oxygen sensitivity of $\pm 1\%$ of reading or 0.1 ppb, whichever is greater

The sensor shall measure dissolved oxygen via membrane covered electrochemical technology

The oxygen sensor shall be designed with silver guard electrode to reduce drift and increase speed of response

The trace level performance shall be insured via a mechanical seal resulting in a fixed zero signal which never requires adjustment. The sensor shall be capable of a simple single point calibration

Model identification

The transmitter shall be ORBISPHERE model 510 transmitter associated with ORBISPHERE series 311xx oxygen sensors.