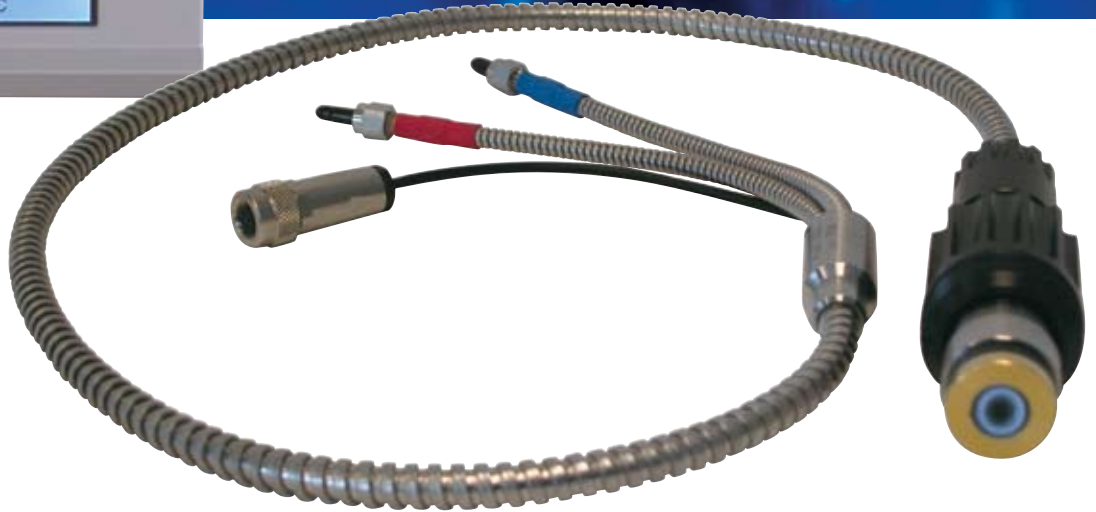


# ORBISPHERE G1100


$O_2$



*Trace oxygen monitoring  
in pure water processes*



EXCELLENCE IN PROCESS ANALYTICS



# O<sub>2</sub>

# ORBISPHERE G1100

*The ORBISPHERE G1100 luminescent sensor offers a new way of monitoring oxygen in high purity water applications.*

*Designed to reduce maintenance requirements and complexity to a minimum, this oxygen sensor is operator independent with a fully automatic calibration method for the peace of mind of the plant chemist.*

*This on-line process analyzer is designed for use in power generation plants running oxygenated treatment (OT), all volatile treatment (AVT) chemistry, or other industrial applications requiring effective oxygen monitoring, such as process water in the semiconductor industry.*

## Operation

The ORBISPHERE G1100 sensor works on the luminescent principle. An active fluorescent spot (1) is excited with blue light and the red luminescent light is detected. The presence of oxygen changes the decay time of the red luminescent light. With the appropriate calibration curve, the decay time is transformed into an oxygen partial pressure value.

A complete system consists of a user interface, a flow-cell, a sensor and a calibration sample. Installation is easy and short and does not require special preparation. The plug and play sensor is immediately ready to measure.

## Calibration

Thanks to a carefully designed manufacturing process the sensor only needs an adjustment of the zero. This is achieved by exposing the luminescent spot to pure nitrogen. The advantage of this gas phase calibration is the possibility to use certified and traceable gas standards. In the common range from 0 to 600  $\mu\text{g kg}^{-1}$  you only need a calibration every 3 months. A standard calibration gas bottle (1l, 34 bars) allows a monthly calibration during its validity period of 3 years.

The calibration procedure can be launched manually or be user programmed to run automatically at defined intervals. Once the sensor is exposed to the calibration sample, the instrument software verifies the signal is within an acceptable range and stable to validate the calibration parameter.

## Maintenance

Normal maintenance is reduced to the replacement of the active spot every 1-2 years.

## Benefits

- Accuracy and reliability not operator dependent:
  - Dry sensor with no membrane, no electrolyte and no chemicals
  - On-line calibration programmable to meet operating requirements
  
- Minimizes operator time with the analyzer:
  - Fully automatic on-line calibration
  - Service requirements limited to 5 minutes every 1-2 years

- *First luminescent sensor for process ppb level oxygen monitoring*
- *Traceable fully automatic in-situ calibration*
- *Low cost of ownership: downtime reduced to 5 minutes annual service*
- *Dry sensor: no electrolyte, no chemicals, and no membrane*
- *Perfectly suited for OT and AVT, including plants working shifts: oxygen levels do not affect service intervals*
- *Simple to install and operate.*

## Diagnostics and Alarms

To ensure continuous high performance and simplify maintenance, The ORBISPHERE 410 systems offer a number of diagnostics features including:

- Notification that a sensor service is due – optimal preventative maintenance planning.
- Notification that calibration sample needs replacement.
- Notification of potential auto-calibration or auto-verification failure.
- Notification of system or sensor failure.

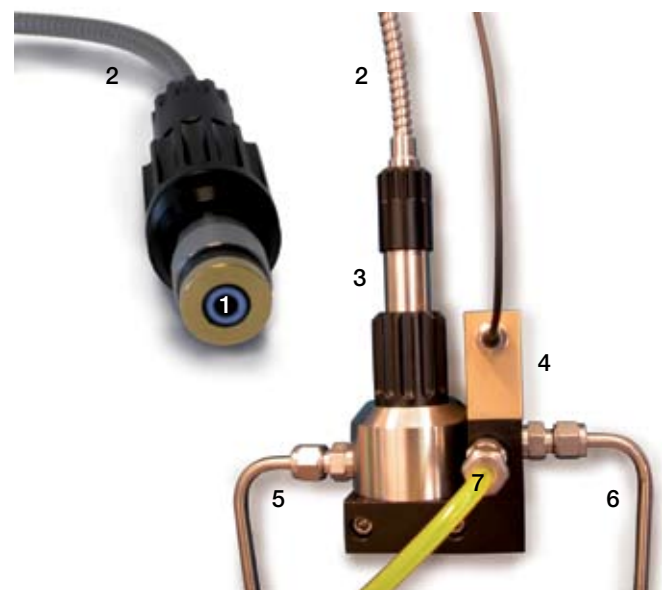
All diagnostics information as well as any user programmable measurement alarms can be assigned to one of the 3 available relays or to one of the 3 smart analog outputs.

## Communication and data management

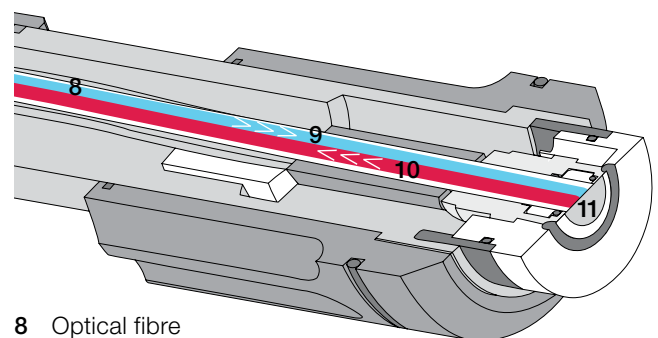
Real time data is available through standard 0/4-20 mA analog outputs, RS485, Profibus DP, Ethernet. In addition any stored information including:

- Historical data
  - Calibration reports
  - User log book
  - System configuration
- can be retrieved by RS485, Ethernet, USB-client, and USB-host (USB Memory stick).

- **Increases confidence in results:**
  - Manual and automatic calibration modes are traceable
  - Real time diagnostics including notification of due service, need for calibration sample replacement, calibration operation or configuration failure, sensor or system failure.



- |                           |                         |
|---------------------------|-------------------------|
| 1 Active luminescent spot | 4 Calibration valve     |
| 2 Optical fibre           | 5 Sample outlet         |
| 3 Sensor body             | 6 Sample inlet          |
|                           | 7 Calibration gas inlet |



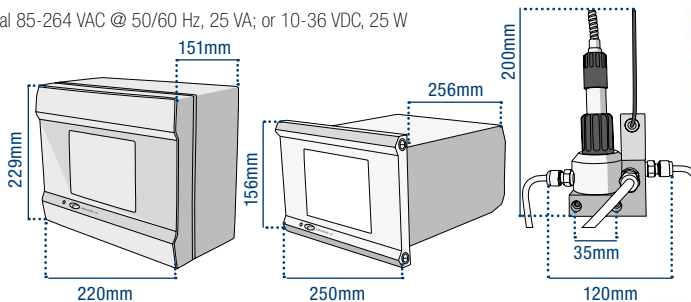
- |                                 |
|---------------------------------|
| 8 Optical fibre                 |
| 9 Blue light (excitation)       |
| 10 Red luminescence (detection) |
| 11 Active luminescent spot      |

# Performance Specifications

Sample	Temperature	5 to 45 °C (41 to 113 °F) Sensor resistant to temperature from -5 to 100 °C (23 to 212 °F)
	Pressure	1 to 4 bar abs (14.5 to 58 psia)
	Flow rate	50 to 500 ml/min
Measurement	Range	0 to 20'000 ppb
	Repeatability	± 1 ppb + 2% in the 0 to 600 ppb range
	Reproducibility	± 2 ppb + 2.5% in the 0 to 600 ppb range
	Lowest detection limit	0 ppb ± 2 ppb
	Response time (90%)	30 s
	Display resolution	1 ppb
	Calibration	Fully automatic user programmable single point zero calibration
	Verification	Fully automatic user programmable single point zero verification
	Calibration sample	Standard 99.999% N2 (quality 50) gas bottles with 5/8" x 18 (C10) connection. Ask your local Hach Ultra representative for advise on local suppliers.  Dedicated pressure regulator is available from Hach Ultra
Transmitter	Enclosures	Wall (pipe) mounting, stainless steel, IP65 Panel mounting, aluminium, IP65
	Certifications	Electromagnetic compatibility standards: EN61326:1997 /A1:1998 /A2:2001 /A3:2003 Safety standard: EN61010-1: 2001 Directive 73/23/EEC
	Display	Monochrome STN 320 x 240 pixels with LED backlight.
	Analog outputs	3 Smart 0/4 – 20 mA (500 Ohms), programmable as linear or tri-linear, configurable to send diagnostics or alarm information.
	Relays	3 measurement alarm relays (2A-30 VAC or 0.5A-50 VDC), configurable to send diagnostics information. 1 system alarm relay (2A-30 VAC or 0.5A-50 VDC).
	Digital communication	RS485
		Profibus DP (optional)
		Ethernet
	Data storage	Rolling buffer or store once mode for up to 1000 measurements and 1000 operator actions Holds calibration records for the last 10 calibrations
User interface	Touch-screen panel: displays concentration, trend graph, diagnostics, alarm status, historical data. Password protection: five levels of authorised access to configuration and data management	
Accessories	2 years spares kits, active spots, spare sensors, tool kit, pressure reducers for calibration gas bottles... ask your local HACH ULTRA representative for more details on all available spare parts and accessories.	

Installation	Sample connection	6 mm or 1/4" tubing
	Ambient temperature	-5 to 50 °C (23 to 122 °F)
	Humidity	0 to 95% non-condensing relative humidity
	Power supply	Universal 85-264 VAC @ 50/60 Hz, 25 VA; or 10-36 VDC, 25 W

Weights	Wall (pipe) mount transmitter	3.8 kg
	Panel mount transmitter	2.9 kg
	G1100 sensor	0.5 kg
	G1100-F flow chamber	0.8 kg
	1l calibration gas bottle incl. valve	0.7 kg



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