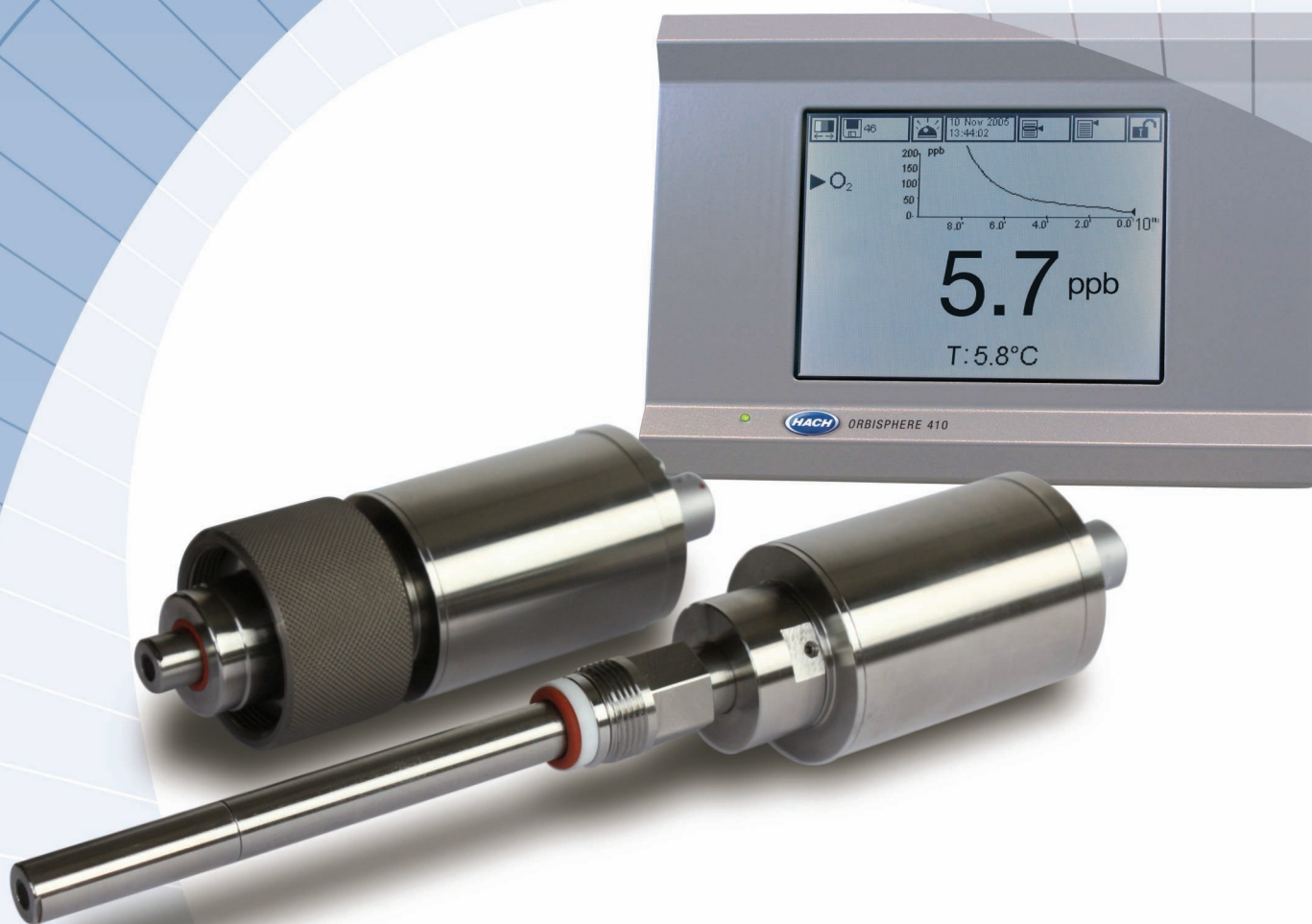


INFORMATION

PROCESS ANALYSIS
LUMINESCENT OXYGEN SENSOR
ORBISPHERE M1100



The new benchmark in oxygen monitoring

ORBISPHERE M1100 Luminescent Oxygen Sensor



LANGE 

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Oxygen monitoring in beer and de-aerated water

The ORBISPHERE M1100 optical sensor together with the ORBISPHERE 410 controller offers a new way of monitoring oxygen in beer and de-aerated water. ORBISPHERE sensors set the industry standards for oxygen measurement by offering “peace of mind” to every brewer and quality manager. The new ORBISPHERE M1100 maintains this tradition and offers significant operating and cost benefits.

- **Low drift, quick response and annual calibration**
- **Accuracy in ppb oxygen measurement for effective process control**
- **Optical technology eliminates membrane and electrolyte to minimise maintenance**

These benefits are perfectly designed for the brewing environment.

Low drift, quick response and annual calibration

The quick response time comes from the ORBISPHERE M1100 two second measurement frequency. Capable of measuring accurately at this frequency over a 12 month period. With no calibration in brewing processes using weekly CIP, the M1100 surpasses other optical sensors that display significant drift after only a few months in the same conditions. For processes using daily CIP, this sensor measures accurately for over 6 months without any calibration or intervention.

This optical sensor is designed for minimal drift, resulting in it being the most stable sensor with the longest calibration intervals achievable in the market.

This is possible by its long-life spot and optimised controller software.

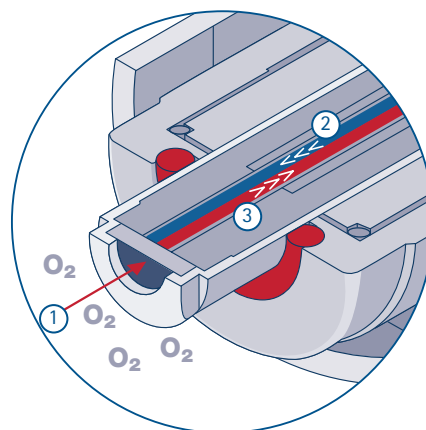
Maintenance intervention is limited to 2 minutes and a zero point calibration, which offers significant cost benefits compared with traditional electrochemical sensors and other luminescent sensors. Using gas phase calibration means chemicals are not required, making the task easier and safer without reducing measurement precision.

Accuracy in ppb oxygen measurement

This sensor has an unbeatable precision of 0.8 ppb and a limit of detection of 0.6 ppb. Such accurate measurement readings are essential to control low oxygen levels in beer. This also allows operators to decrease unnecessary line stoppages and increase production uptime through more reliable process visibility.

Optical technology eliminates membrane and electrolyte

The absence of membrane and electrolyte means that the sensor accuracy is unaffected by process changes or pressure shocks. Maintenance and operating costs are also reduced. The sensor has been designed to ensure mechanical robustness and resistance to CIP processes to extend operational lifetime and optimise its total cost of ownership.



Oxygen interacts with the active luminescent sensor

1. Active luminescent spot
2. Blue light (excitation)
3. Red light (detection)

Optical sensor technology

The ORBISPHERE M1100 sensor uses luminescent measurement technology.

An active fluorescent spot is excited with blue light and a red luminescent light is detected. The presence of oxygen changes the rate of fluorescence decay and this directly relates to the oxygen partial pressure value.

The complete system

The complete system consists of an ORBISPHERE 410 controller, an insertion device, and the ORBISPHERE M1100 luminescent sensor. The sensor is compatible with both 28 mm insertion devices and PG 13.5 stationary housings, therefore minimising retrofit costs.

The installation is fast and easy and does not require special preparation. The “plug and play” sensor is immediately ready for measurement.

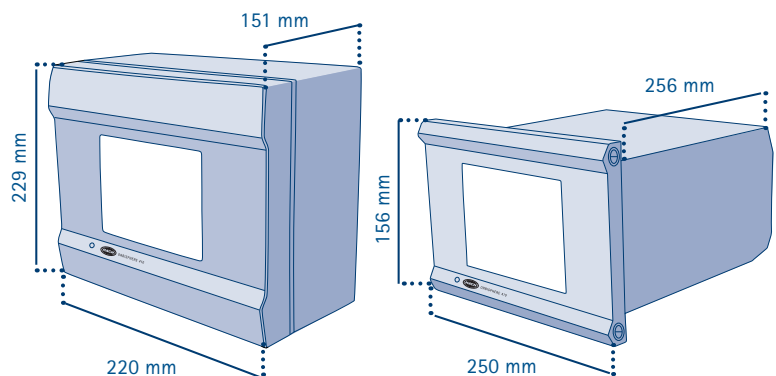
Diagnostics

The ORBISPHERE 410 controller offers diagnostic features that informs users when a sensor service or calibration is due. This supports optimal preventative maintenance planning. It also notifies users of a system or sensor failure.

All diagnostic information as well as user programmable measurement alarms can be assigned to 1 of the 3 available relays or to 1 of the 3 smart analogue outputs.



Controlling oxygen levels with the ORBISPHERE M1100 and 410 controller



ORBISPHERE 410 instruments are available in two versions

Wall and pipe version: mounting is facilitated by use of simple to attach brackets that allow adjustment of the instrument to afford optimum screen viewing angle. Panel mount version: “quick and easy” mounting from the front of the panel using concealed screws.



Technical data

Sample	Temperature	Measurement from -5 to 50 °C (23 to 122 °F) Sensor resistant to temperature from -5 to 100 °C (23 to 212 °F)	
	Pressure	1 to 20 bar abs (14.5 to 290 psia)	
	CIP	Sensor resistant to all common CIP methods	
M1100 Sensor	Range	0 to 2,000 ppb (dissolved)	
	Repeatability	±0.4 ppb or 1 %, whichever the greater	
	Reproducibility	±0.8 ppb or 2 %, whichever the greater	
	Accuracy	±0.8 ppb or 2 %, whichever the greater	
	Limit of detection (LOD)	Down to 0.6 ppb	
	Response time (90 %)	<10 s (gas phase); <30 s in a beer process	
	Flow requirement	50 to 300 ml/min (recommended: 150 ml/min)	
	Display resolution	0.1 ppb	
	Calibration	Single point zero calibration	
	Calibration sample	Standard 99.999 % Nitrogen (quality 50), or equivalent oxygen free gas	
410 Controller	Enclosures	Wall (pipe) mounting, stainless steel, IP 65 Panel mounting, aluminium, IP 65	
	Certifications	Electromagnetic compatibility standards: EN61326:1997/ A1:1998 / A2:2001 / A3:2003 Safety rating ETL, conforming to UL 61010-1 and CSA 22.2 No. 61010-1 Safety standard: EN61010-1: 2001 Directive 73/23/EEC	
	Display	Monochrome STN 320 × 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 (2 A-30 VAC or 0.5 A-50 VDC), configurable to send diagnostics information 1 system alarm relay (2 A-30 VAC or 0.5 A-50 VDC)	
	Digital communication	RS485; Profibus DP (optional); Ethernet; USB-client to download data and from a computer; USB-host to download data with a USB memory stick	
	Data storage	Rolling buffer or store once mode for up to 1,000 measurements and 1,000 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	Active spots, spare sensors, tool kit, portable calibration setup... ask your local HACH LANGE representative for more details on all available spare parts and accessories	
Installation	In process sensor installation devices	ORBISPHERE "Pro-Acc" extraction system for installation on Varinline® Access units ORBISPHERE 28 mm sensor weld-on socket PG 13.5 stationary housing for installation on Varinline® access units 28 mm stationary housing for installation on Varinline® access units	
	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; 10-36 VDC, 25 W	
	Weights		
	Transmitter	Wall (pipe) mount	3.8 kg
		Panel mount	2.9 kg
	Sensor	M1100 12 mm (PG13.5)	0.6 kg
		M1100 28 mm	0.74 kg
	Calibration	Device (excl. calibration gas)	0.7 kg

Ordering information

410 M / W1C00000		ORBISPHERE 410 Controller (wall mount)
M1100-S00		ORBISPHERE M1100 28 mm Luminescent Oxygen Sensor compatible with ORBISPHERE insertion devices
Alternative for 12 mm sensor: M1100-S10		ORBISPHERE M1100 12 mm Luminescent Oxygen Sensor compatible with PG 13.5 mm stationary housing
Accessories	32510.05	Sensor cable (5 m)
	32003	Sensor insertion and retraction valve for mounting on Varinline® access unit with 28 mm sensor
Alternative for 12 mm sensor: 33096		PG 13.5 stationary housing; for mounting on Varinline® access units with 12 mm sensor

Varinline® is a registered trademark of GEA Tuchenhausen.

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