

ORBISPHERE A1100

O₂



Simply accurate

Features

- Sensor refurbishment in 3 minutes with pre-filled recharge cartridge* (*patent-pending)
- Unique design allows for extended period between recharges
- Unrivalled accuracy and response time for fast detection of process change
- Robust stainless steel design for use in the most demanding applications including resistance to CIP and pressures up to 100 bar
- 100% retrofit to existing ORBISPHERE sampling devices
- Plug and play for process operator with Smart chip storing calibration parameters in the sensor

The ORBISPHERE A1100 oxygen sensor is the latest development of the well-known and proven ORBISPHERE Electro-Chemical (EC) sensors.

This sensor is designed for process monitoring as well as laboratory analysis in the liquid or gas phases across a wide range of applications from beer or soft-drinks production to rinsing of semiconductor wafers in chip-manufacturing plants, reactor coolant systems in nuclear power plants, or any place where oxygen measurement is critical.

A negligibly small residual signal and an unrivalled accuracy (± 0.1 ppb) are made possible by the exclusive ORBISPHERE design. The very fast response time (down to $t_{90} = 7.2$ s) is achieved through a unique membrane installation, and is improved through the use of an auxiliary guard ring electrode to shield against the influence of other gases and improve stability. All these features provide a reliable and accurate sensor with fast reaction to sample changes for highly effective process monitoring.

Sensor cleaning and preparation require no technical skills. The new sensor head design allows for very quick cleaning with no other chemical than tap water. With the pre-mounted membrane cartridge including electrolyte the sensor is ready to use in 3 minutes without the risk of incorrect membrane mounting.

Each sensor includes a Smart chip that stores the sensor serial number and the calibration parameters. Sensors can be serviced and calibrated in the lab and made available as "Plug and Play" devices for process operators, thus limiting potential manipulation errors and improving the availability and reliability of the oxygen measurement.

The same sensor can be installed directly in-line with an appropriate access device, in a flow chamber for on-line analysis or in a portable system for laboratory use or spot check measurements.

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EXCELLENCE IN PROCESS ANALYTICS

Specifications of ORBISPHERE A1100 EC Sensors

ORBISPHERE A1100 oxygen sensors are 100% compatible with ORBISPHERE 36XX series and 410/510 series instruments and 100% retrofit to all ORBISPHERE sampling devices. Different pre-mounted membrane kits are available to fulfill any particular process requirements.

Application dependent membrane / Sensor specification

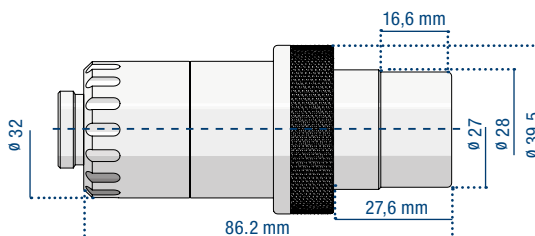
Cartridge Model	2935A-A	2952A-A	2956A-A	2958A-A	29521A-A	29552A-A	2995A-A
Recommended applications	Saturated to super saturated levels	Corrosion control; in-line beverage; deaerated water			In-line hot wort (maximum 70°C / 158 °F)	In-line wort; air/O ₂ injection; sewage treatment	Saturated to super saturated levels
Material	Halar®	Tefzel®	PFA	Tefzel®	Tefzel®	PTFE	Tedlar®
Thickness	25 µm	25 µm	25 µm	12.5 µm	125 µm	50 µm	12.5 µm
Integrated radiation dose limit	N/A	10 ⁸ rads	2 x 10 ⁴ rads	10 ⁸ rads	10 ⁸ rads	N/A	10 ⁸ rads
Current in air at 25 °C / 77 °F	1 µA	5 µA	25 µA	8 µA	0.75 µA	5 µA	0.2 µA
Dissolved O ₂ measurement range	10 ppb-400 ppm	1 ppb-80 ppm	0.1 ppb-20 ppm	1 ppb-40 ppm	10 ppb-400 ppm	2 ppb-80 ppm	50 ppb-2000 ppm
Gaseous O ₂ measurement range	20 Pa-1000 kPa	5 Pa-200 kPa	0.25 Pa-50 kPa	2 Pa-100 kPa	20 Pa-1000 kPa	5 Pa-200 kPa	100 Pa-5000 kPa
Accuracy (Assuming correct calibration)	± 1% of reading, or ± lower range, whichever is greater						
Optimised temperature compensated range	-5 °C to 60 °C 23 °F to 140 °F	-5 °C to 60 °C 23 °F to 140 °F	-5 °C to 60 °C 23 °F to 140 °F	-5 °C to 60 °C 23 °F to 140 °F	-5 °C to 60 °C 23 °F to 140 °F	-5 °C to 60 °C 23 °F to 140 °F	-5 °C to 60 °C 23 °F to 140 °F
Response time (T ₉₀ from air)	2.5 min.	38 sec.	7.2 sec.	9.5 sec.	18 min.	90 sec.	80 sec.
Recommended liquid Flow rate*, ml per min., in 32001 flow chamber	25	50	180	120	25	50	5
Recommended linear Liquid flow rate* cm/sec	20	30	200	100	60	30	5
Recommended gaseous flow rate	0.1 to 3 l/min.	0.1 to 3 l/min.	0.1 to 3 l/min.	0.1 to 3 l/min.	0.1 to 3 l/min.	0.1 to 3 l/min.	0.1 to 3 l/min.

*Flow rates for Model 32001 flow chamber are valid for sensor configured with no grille on protection cap.

Use of a protection cap with grille will require approximately 50% faster flow.

Sensor characteristics

Weight	300 g
Pressure resistance (Mechanical and during measurement)	Up to 100 bar (1450 psia)
Temperature range (during measurement)	-5 °C to 60 °C / 23 °F to 140 °F (without grille) -5 °C to 95 °C / 23 °F to 203 °F (with a grille)
Temperature range (Mechanical)	-15 °C to 110 °C / 5 °F to 230 °F (due to electrolyte, but sensor will not be damaged up to 200 °C / 392 °F)
Water Ingress	Sensor: IP68 Cable connection: IP68
Materials in contact with the sample*	Stainless Steel 1.4404 (AISI 316L), surface finish: N5, Ra < 0.4 µm
*No O-rings are in contact with the sample	Membrane (see specification table)
Smart capability Stored data	Smart Memory chip with RS485 communication up to 500 m Sensor model, serial number Calibration parameters of last 10 calibrations
Accessories and spare parts	Pre-filled recharge cartridges including electrolyte are supplied in 4-cartridges packs and can be ordered for each type of membrane as shown in the specifications table Ask your local ORBISPHERE representative for a complete list of spares and accessories



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PROCESS ANALYSIS

OZONE SENSOR

ORBISPHERE C1100

Features and Benefits

True Zero - drift free and accurate measurements

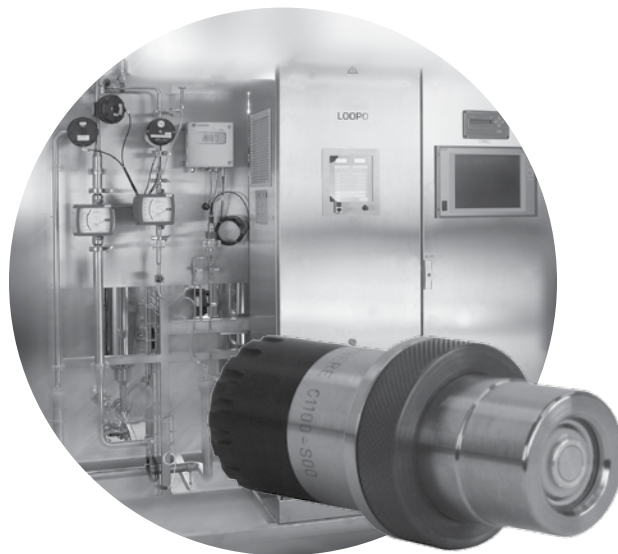
With the unique ORBISPHERE platinum guard ring technology preventing false signals arising from the electrolyte, this sensor provides a true, drift free zero. Operators can be confident of measurements and alarm settings knowing the sensor is providing a 0.6 ppb detection level and ± 0.4 ppb accuracy at a 5 ppb level. Wasted production is eliminated with no alarm discrepancies and risk is reduced in stopping the production line.

Fast, easy, traceable and reliable calibration

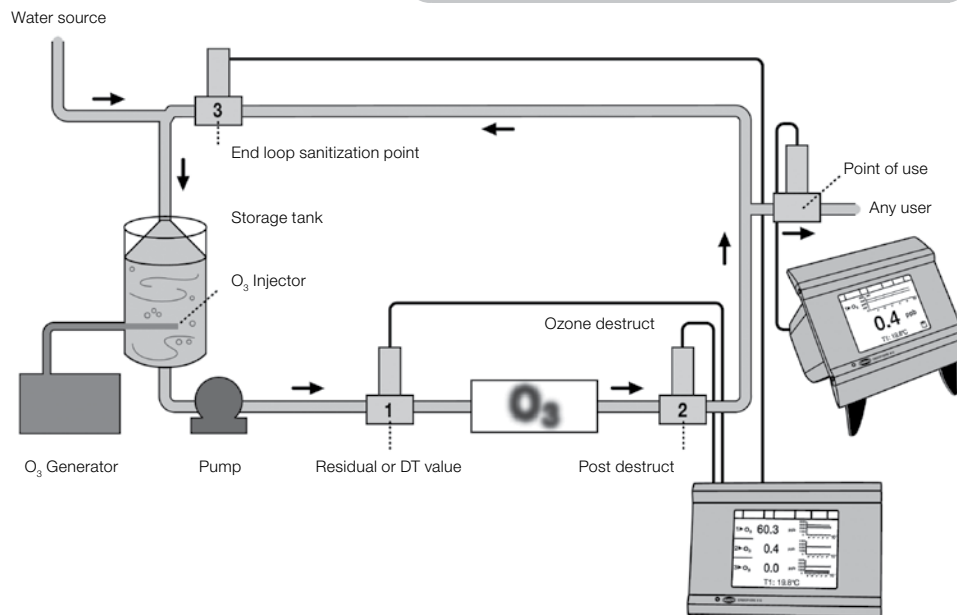
The C1100 ozone sensor has a unique air calibration feature that offers operators a quick and easy method to calibrate without requiring an external standard. Air calibration provides an accuracy of better than $\pm 5\%$ (achieving better than $\pm 1\%$ against an ozone standard of known concentration). The sensor is delivered with a traceable validation certificate using a $\pm 0.5\%$ reference. The ORBISPHERE C1100 is the only sensor in the available that provides such certified high accuracy!

Saving WFI costs with in-line mounting

Because of the unique ORBISPHERE C1100 engineered design and performance; this sensor can be used in-line without the need to take costly WFI through sample flow cells to drain. This represents an opportunity for operators to save more than 15 m³ per day in comparison to other measurement systems on the market today.



Typical ozonated water loop



The ORBISPHERE C1100 ozone sensor is designed to offer pharmaceutical operators peace of mind when measuring ozone in ultrapure water loops. This sensor can measure ozone at the pre-UV and post-UV phases and at the end of the loop.



Be Right™

Specifications

Measuring Range	0 ppb - 50 ppm O ₃
Accuracy	±0.4 ppb or ±5%, whichever is greater
Repeatability r95 (2σ)	±0.4 ppb or ±0.5%, whichever is greater
Pressure Rating	40 bars / 100 bars (Stainless steel / Titanium) (580 psi / 1450 psi)
Limit of Detection (3σ)	0.6 ppb
Response Time	30 s
Working Operating Range	-5 to 45 °C (23 to 113 °F)
Maximum Operating Range	-5 to 100 °C (23 to 212 °F)
Membrane	2956A-C

Note: limit of quantification = 10σ Subject to change without notice.

Ordering Information	C1100-S00	Electrochemical ozone sensor, stainless steel version, maximum pressure 40 bar
	C1100-T00	Electrochemical ozone sensor, titanium version, maximum pressure 100 bar

EN 10204 2.2 and 3.1 certificates are available upon request.

Service

Robustness and ease of use is addressed in the design and development of every Hach instrument. Nevertheless, even the finest instruments require care and attention. To meet this need, Hach has developed the most comprehensive network of service centers and certified agents in the industry. This global network offers on-site service and calibration support as well as local bench service facilities.

At Hach, we provide coverage for every aspect of the system from installation and calibration to data analysis and audits. In addition, comprehensive IQ/OQ documentation and on-site support can significantly reduce validation time. Hach service contracts keep your equipment in compliance and operating at peak performance to minimize downtime.

- Service partnership programs: Our all-inclusive agreements for service and support provide confidence and security for your operations.
- In-factory services: Including warranty and repair services, check-up and calibration, and service loaners.
- On-site services: Including warranty and field repair work, start-up and installation services, training and preventive maintenance plans.
- Custom service programs: For your unique requirements.

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