

Ozone sensor

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High concentration ozone-in-water sensor BMT 964 AQ & BMT 964 AQ/HF



The ozone-in-water sensor BMT 964 AQ is a UV photometer for direct measurement of the ozone content of ultra-pure water, or water with constant turbidity. A special version BMT 964 AQ/HF for up to 20% hydrofluoric acid, is available. The instrument is based upon our ozone analyzer BMT 964 for gaseous ozone.

Cleaning of the cuvette windows – if necessary – is quite simple. Materials in contact with the ozonated water are: PTFE, PVDF, FFPM, PFA and quartz or sapphire.

The BMT 964 AQ is a sensor because it does not have a display. It is designed to directly be connected to a workstation via a 4 - 20 mA, or 0 - 10 V, signal line.

An optional remote display BMT 964 RD is available for installations without a workstation. To operate with the remote display, the BMT 964 AQ has to be ordered in the version BMT 964 AQ/RD.

Applications

- Monitoring of ozone in ultra-pure water, or water with constant turbidity (or hydrofluoric acid solution up to 20% HF)
- Semiconductor ozone processes



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Superior stability of the photometer is achieved by use of a true dual beam optical system with an extremely long-life mercury lamp. MTBF of the instrument, including the lamp, is in excess of 65,000 hours. Excluding the lamp, it is 120,000 hours.

The built-in microcontroller allows for programming many parameters of the instrument via the remote display, or via a Windows PC using the software BMT 964 Link (delivered with the instrument).

The ozone - in - water sensor BMT 964 AQ comes in a splash proof aluminium enclosure (IP 65, NEMA 4X) 260 x 160 x 91 mm (W x H x D) with sea water resistant coating (RAL 5009, azure), and weighs about 3 kg. Four mounting brackets are provided for installing the sensor where it is needed, e.g. underneath a work bench. All electric connectors are water proof.

When the fluid to be measured is at lower temperature than the ambient, flushing of the instrument with clean dry air (or nitrogen) is necessary to prevent condensation of water. Flow rate of the dry gas should be about 0.2 l/min.

If a throttle (flow resistance) is installed to control the flow rate through the ozone-in-water sensor, this throttle must be positioned behind the sensor (never in front of it!), because gas could bubble out after a pressure drop disturbing measurement.

Features

- Dual beam UV photometer
- Long-life mercury lamp
- Warranty 3 years, 5 years on the UV lamp
- High accuracy, error less than 0.5%
- Ranges from 10 to 150 g/m³ (ppmw)
- HF resistant version available
- Relay contact for control of automatic zeroing
- Error handling: summary error, lamp low, cuvette dirty, overrange
- Early warnings: lamp low, cuvette dirty
- Key functions programmable via the front panel, or a Windows PC
- Display in g/m³ or ppmw
- High and low limit alarms
- Timing sequence for automatic zeroing
- 4-20mA and 0-10V isolated outputs
- RS-232 interface (bidirectional, isolated)
- Option: remote display for readout and control

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As long as the cuvette of the sensor remains clean, zeroing of the instrument is not necessary for weeks, or even for months. But for safety, zero reading should be checked on a regular basis.

In the ozone-in-water sensor BMT 964 AQ the isolated signal outputs are tied to protective ground by a resistor of 10 MegOhms.

Additional BMT products (for details, refer to the appropriate data sheets):

- BMT 964 AQ-LC for low concentration measurement in ultrapure DI (de-ionized) water
- BMT 964 (standard version) for ozone measurement in the gas phase
- BMT 932 ozone monitor for TLV monitoring in ambient air (1, 3 & 6 channels)
- BMT 802N (4 g/h) & BMT 803N (8 g/h) ozone generators

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Technical specification

Measurement range	Dual-beam UV photometer (254 nm), no moving parts		
MTBF	Instrument incl. UV lamp 65,000 h, excl. UV lamp 120,000 h		
UV lamp	Low pressure mercury lamp, long life design, burnt-in for 300 h		
Concentration ranges	10, 50, 100, 150 g/m ³ , selectable units g/m ³ and ppmw HF version: 10, 20, 50, 100, 150 g/m ³		
Accuracy	After zeroing the max. error is the sum: 0.4% of measurement + 0.1% of scale		
Repeatability error	0.2 % of measurement		
Response time	0.03 s (analog output), 0.3 s (remote display)		
Zero drift	Typ. 0.2% of range per day, after warm-up, non-cumulative		
Max. inlet pressure		AQ	AQ/HF
	10 g/m ³	1.0 barg	2.5 barg
	20 g/m ³	-	2.5 barg
	50 g/m ³	4.0 barg	2.5 barg
	100 g/m ³	4.0 barg	4.0 barg
150 g/m ³	6.0 barg	4.0 barg	
Ambient temperature	10–30 °C (50–86 °F)		
Materials in contact with ozone	30–60% RH		
Fluid ports	1/4" Flaretek		
Recommended flow rate	0.1 to 0.3 l/min		
Pressure drop	Approx. 33 mbar at 0.3 l/min		
Signal outputs	Concentration 4 - 20 mA (isolated, active) Concentration 0 - 10 V (isolated)		
Concentration alarms	High alarm, low alarm, latching, not latching		
Concentration alarms	Set to zero (24 V, 18 mA, isolated)		
Control outputs	Relay contacts, 28 V, 0.5 A, isolated: Lamp low, cuvette dirty, high alarm, low alarm purge control		
Error handling	Error relay: 30 V, 1 A, summarizing instrument failures. Lamp low error, lamp off error, cuvette dirty warning, cuvette dirty error, overrange, overpressure		

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Technical specification

Early warnings	Lamp low warning, cuvette dirty warning
Serial interface	RS-232, bidirectional, isolated 2400 - 38400 Baud
Automatic zeroing	Possible via control input
Software	BMT 964 Link, instrument configuration & readout of event and error logs on a Windows PC
Power	Wide range input: 100 - 240 VAC, 15 VA Optional: 12 - 36 VDC, 15 W
Dimensions (W x H x D)	260 x 160 x 91 mm
Weight	3 kg

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