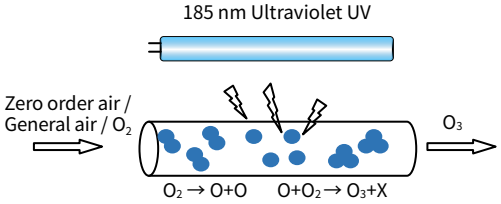
Ozone Analyzer

Applicable to measurement and analysis of environmental protection industries such as semiconductor, agriculture, water resources, etc.

Ozone Analyzer

| Features |

- UV-D photometric method determination of ozone concentration, traceable to NIST international standards
- Wide measuring range / Dynamic full-range measurement mode
- Quickly switch between measuring range and concentration unit(Six types)
- LCD, display of concentration, temperature and pressure
- Automatic temperature and pressure compensation / Built-in aspirator pump



Create ozone from oxygen schematic diagram

| Introduction |

The most commonly used is the principle of Ozone Analyzer is the ultraviolet absorption method, which uses a stable ultraviolet light source to generate ultraviolet rays, and filters other wavelengths of ultraviolet light through a special quartz glass. Only 253.7±1 nm are allowed to pass.
A single stable UV light source can reach the sampling photoelectric transmitter after passing through the highly transparent quartz glass window and the ozone reaction tank.
Through the ratio of the electrical signals(Light intensity) of the sample and the photoelectric sensor that filters ozone-free air, the data can be transmitted after analysis by the management software, we can calculat the ozone concentration.
Ozone generation and treatment technology has a wide range of applications in various industries.
It has the advantages of cleanliness, deodorization, decolorization, sterilization, no residue, and low cost, which is in line with the advantages of green industrial processes.
After the final reaction and half-life of ozone, it will be reduced to oxygen, so there will be no problem of toxic residue.

Application:
Mainly used in ozone preparation workshop(Ozone generator / ozone plant building, etc.) / Chemicals / Petroleum / Paper / Textile / Pharmaceutical and essence perfume industry / Waterworks / Sewage / Ozone industry / Industrial process water treatment and ozone disinfection testing in pure water industry / Food and medicine sterilization workshops and other occasions

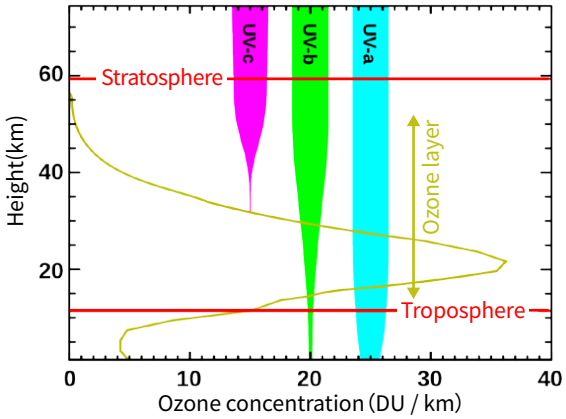
| Specification |

Item	Function & Parameter	
Type	Standard type(User-range)	Standard type(Auto-range)
Measuring range	1000 ppm$_v$ / 1% / 20%$_{v/v}$ / Auto-range	1 ... 100 ppm / User-range
Analog output	Analog output(Optional)	Analog output(Optional)
	4 ... 20 mA / DC 0 ... 1 V / DC 1 ... 5 V(Choose one)	4 ... 20 mA / DC 0 ... 1 V / DC 1 ... 5 V(Single selection)
Display unit	ppm、%、mg/m^3、g/m^3 at Auto-range	ppb、ppm、mg/m^3、μg/m^3 at Auto-range
Heat engine time	≤5 min	≤5 min
Resolution	Min. 0.1 ppm$_v$ at 1000 ppm	Min. 0.1 ppb$_v$ at 1 ppm
Reaction time(T95)	＜10 sec	40 sec at 500 ppb
Data update speed	0.1 sec ... 100 min	0.1 sec ... 100 min
Data average time	0.1 sec ... 25500 min	0.1 sec ... 25500 min
Data storage	4000 rows of data record(Max. storage capacity 270 days, hardware output)	4000 rows of data record(Max. storage capacity 270 days, hardware output)
Zero drift	Automatic compensation	Automatic compensation
Accuracy (Instrument error)	±2%F.S.(Full scale)	Reading±1% at 100 ppb ... 100 ppmv Provide ISO17025 report traceable to NIST SRP#30
Sample update speed	1 sec ... 24 hr	1 sec ... 24 hr
Detecting unit	254 nm, reduced to 50% after about 20,000 hours of life	254 nm, reduced to 50% after about 20,000 hours of life
Sampling & Calibration flow	1.0 L/min(not included pump)	1.0 ... 1.5 L/min(Built-in pump)
Exterior dimension	L250xW200xH62 mm	L250xW200xH62 mm
Weight	1.5 kg(Include active carbon)	1.5 kg(Include purification device)
Power supply	DC 12 V, 1.5A max. at AC 100 ... 240 V, 50 / 60 Hz	DC 12 V, 1.5A max. at AC 100 ... 240 V, 50/60 Hz
Operating Temp. range	0 ... 40°C	0 ... 40°C
Operating pressure range	700 ... 780 mmHg	700 ... 780 mmHg
Digit signal output	USB(Temp. / Pressure / Concentration)	USB(Temp. / Pressure / Concentration)
Warning signal output	LED(Filter clogging/ Light source / Active carbon / Calibration reminder)	LED(Filter clogging / UV light source / Ozone purifier / Calibration)
Standard accessories	User manual	User manual
	Silicone tube(0.5 m)	Silicone tube(0.5 m)
	B-type USB cable(1 m)	B-type USB cable(1 m)
	USB to RS-485 one communication line (User self-calibration)	None
	DC 12 V 1.5 A max. 1 voltage transformer	DC 12 V 1.5 A max. 1 voltage transformer
	Verification retrospective report	Calibration retrospective report
	Software CD for user self-calibration	None
Optional accessories	Software CD for user self-calibration and concentration conversion(Advanced version)	Select two correction range(Calibration fee is extra)
	Float ozone resistant flow controller(0 ... 2 LPM)	Float ozone resistant flow controller(0 ... 2 LPM)
	None	Software CD：Read, self-calibration, switching and other functions
	Pump DC 110 / 220 V 60 Hz	Pump DC 110 / 220 V 60 Hz
	None	USB to RS-485 communication cable：Self-calibration, switching and other functions

| Ultraviolet Radiation |

Ultraviolet(UV) according to the definition of ISO 21348, range of 100 ... 400 nm which can be subdivided into:

1. VUV(UV-D) 10 ... 200 nm
   Vacuum UV:Will be strongly absorbed by molecular oxygen in the air
2. UV-C 200 ... 280 nm
   Can kill bacteria, most are blocked by the atmosphere / ozone
3. UV-B 280 ... 315 nm
   Can cause sunburn, cause skin cancer and weaken the human immune system
4. UV-A 315 ... 400 nm
   Can penetrate clouds, glass, and human skin, causing skin tanning



| Beer law |

Formula(1)

$$A = abc$$

A:Absorbance a: is the molar attenuation coefficient or absorptivity of the attenuating species (Absorptivity, 308 cm-1 under standard conditions) b:is the optical path length
c:is the concentration of the attenuating species

The absorption coefficient is related to temperature, pressure, and wavelength(~ 253.7 nm, and the maximum absorption wavelength of ozone). Today, the concentration of ozone is first converted to the standard state (1 atm and 0°C) for comparison using the ideal gas law, so the formula (1) change to the formula (2)

$$C = \frac{-1}{2ab}\frac{P_{std}}{P}\frac{T}{T_{std}} ln\left(\frac{I_0}{I}\right)$$

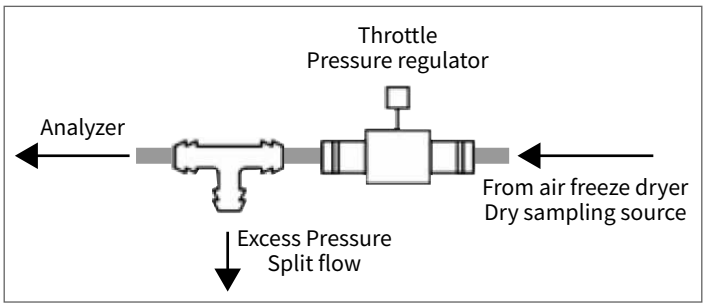
C:Ozone concentration under standard state (1 atm, 0°C) Pstd:Pressure under standard state
Tstd:Temperature under standard state P:Testing pressure T:Testing temperature
IO:Light intensity before UV penetration I:Light intensity after UV penetration
Formula(2) is only applicable to single-beam. If the analyzer is designed with dual beam, one light path passes through zero air, and the other light path passes through the ozone and alternately passes through. Then change to the formula(3)

$$C = \frac{-1}{2ab}\frac{P_{std}}{P}\frac{T}{T_{std}} ln\left(\frac{I_{1,O_3}}{I_{1,Zero}} \times \frac{I_{2,O_3}}{I_{2,Zero}}\right)$$

Compared with single-beam, the double -beam design can reduce the zero drift, is relatively stable and the concentration can react quickly.

| Sampling Instructions |

Sampling of high-pressure air source, it is recommended to use T pipe tap relief mode, and do not make the pressure too high, avoid the pipeline the loose during operation.
Use the dry gas source(the gas better after dehumidification), to avoid the pollution of the pipe by moisture, or the light intensity to interference of low-concentration ozone.



| Operation Guide |

1. After warming up, the screen will display the digital countdown timer.
2. The value of display is the concentration, the reactor tank temperature and pressure (not external). Under normal conditions during the pumping, the internal pressure of the tube is below 750 ... 760 mmHg.
3. If the low-concentration model type built-in an air extracting pump, the air source inlet pleases sent normal pressure gas, Do not send the positive pressure gas.
4. Analog output and RS-485 are optional, please contact sales.
5. Pump(1.5 L/min).
6. Update / every 6 seconds.