Air Quality management in Pool - annual service contract

To meet the challenges of health and energy efficiency in swimming pools, Octopus Lab and Ethera have developed **a complete solution, Swim air Vision®,** allowing :

- **Continuously monitor the air quality of swimming pools** (NCl3, CO2, T, HR) with a measurement of trichloramine **validated by the CSTB (French national building science center)**
- **Visualize the measured and predicted indoor air quality data** on a web interface
- Access to **indoor air quality reports**
- **Be alerted** by email when limit values are exceeded
- **Regulate the ventilation** in an intelligent way, by anticipating air pollution peaks
- **Optimize energy consumption**

You can act manually or automatically to ensure that your staff and swimmers are safe. With automatic reports, **communicate with your customers and lifeguards**, who are often concerned about the potential health effects of trichloramine.

Finally, thanks to this monitoring and indoor air quality forecasts, you can benefit from **intelligent control of your ventilation in order to guarantee good air quality at all times** while **optimizing energy consumption,** the main expense of aquatic activity establishments.

Why should you monitor trichloramine ?

Trichloramine is the source of the specific chlorine odor in swimming pools.

This molecule is produced by reaction of chlore, used for water disinfecton, and organic matter provided by the swimmers (sweat, cosmetics, ...).

It is a highly volatile gas that cause eye, skin and respiratory irritation, even asthma and rhinitis in the event of prolonged exposure. Therefore, Par conséquent, swimmers but also employees like lifeguards are particularly exposed.

Is the measure mandatory?

When employees are exposed to chemical risks, the employer is required to assess, eliminate or reduce the identified risks and to inform and train its employees (L.4121-1 and L.4121-2 articles of the French Labour Code).

In a pool treated with chlorine the risk of generating trichloramine still exists. The above precautionary principles must therefore be applied.

Measurements of trichloramine allow to quantify the concentrations. This helps to set up a strategy to maintain a level below 0.3 mg/m3 recommended by the WHO (World Health Organization).
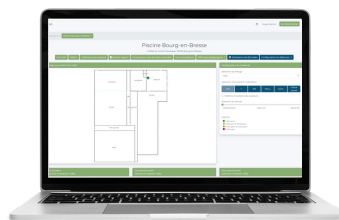
Hardware and software pack

NEMo XT TC station:

Parameters : Trichloramine, CO2, Temperature, Relative Humidity

IoT Connexion: LTE-Cat M1 or NBIoT (2G as an option)
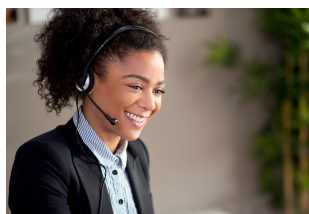
Swim'Air Vision® dashboard:

- Real time data visualization
- 24h forecast
- HVAC control values
- Alerts
- Weekly & monthly reports

Trichloramine cartridges:

Patented trichloramine measurement method used to calibrate the TC sensor during the 15 first days of measurement, , then its quarterly recalibration.

Cartridge replaced in less than a minute.

Service :

Maintenance, cartridge shipping, installation assistance, mail & hotline support: all included

OCTOPUS

All inclusive solution

Air quality monitoring

TRICHLORAMINE	
NANOPOROUS SENSOR	
Measurement method	Optical measurement through a cartridge build with a patented nanoporous material.
Range	From 0 to 100 ppb (0 - 492 µg/m3)
Measurement duration	24 hours
Sampling method	Diffusive passif
Uncertainty	Range 0 - 40 ppb : ±10 ppb ±10% ; Range 40 - 100 ppb : ±20 ppb ±10% (Daily average)
Dispersion	< 9 % on the whole range
Cartridge conservation	Storage duration : 6 months after manufacturing date. Store at ambient temperature (between 15 and 25°C). Open the blister 10 min before cartridge replacement.
TC SENSOR	
Range	From 0 ppb to 100 ppb (0 - 492 µg/m3)
Accuracy compared with nanoporous measurement method	> 90 % (Correlation based on a comparative study involving more than 25 000 measurements realized between september 2021 and december 2022 in real environments (several swimming located in France)
CO2/CONFINEMENT	
Measurement method	Non Diffusive InfraRed spectroscopy sensor (NDIR)
Range	From 0 to 5000 ppm
Resolution	1 ppm
Uncertainty	+/- 30 ppm +/- 3 % of the measured value
TEMPERATURE	
Range	From -55°C to +125°C
Uncertainty	+/- 2°C from -25°C to 100°C (+/- 0,5°C after offset correction)
RELATIVE HUMIDITY	
Range	From 0 to 95 %
Uncertainty	+/- 3 % from 11% to 89% (+/- 7 % out of this range)
CARACTÉRISTIQUES GÉNÉRALES	
Sampling frequency	10 minutes (CO2, T, P, HR, COVL) ; moving average of 30 last minutes refreshed each 10 minutes for Trichloramine with cartridge method
Operational conditions	Temperature between 22°C and +30°C - Relative humidity between 30 and 70 %
Dimensions (L x l x h) / Weight	190 x 135 x 70 mm / 0,52 kg
Power supply / Battery life	• 5V power supply included • back-up battery to handle short power cuts
Display	State LED. Option : 3 colours blinking LED with adjustable CO2 values
Communication	Wireless communication via LTE Cat-M1 network, NB-IoT or GPRS (option)
Waranty	1 an for parts and labour, cartridges excluded
SWIM'AIR VISION® SOFTWARE	
Data access	• Weekly and monthly reports generation (more frequencies can be created) • Unlimited data access • Spreadsheet exports
User accounts	Unlimited used accounts creation; editable user rights; customizable air pollution alerts; configurable mail sending; etc.
HVAC control	AI based intelligent ventilation control as function of indoor air quality forecast : avoir air pollution episodes, over ventilation and enhance energy performance

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All inclusive solution