

Reducing airborne chemical pollutants in water, wastewater & waste facilities



Hydrogen sulfide in wastewater treatment poses significant challenges.

Hydrogen sulfide, ammonia, chlorine dioxide, and other chemicals and gases generated and used during water, wastewater, and solid waste processing and treatment release strong, unpleasant odors and pose significant health risks to workers. In addition, they cause extensive corrosion to equipment and infrastructure. Traditional methods to mitigate these pollutants often involve expensive equipment with costly consumables, a large footprint, and a low return on investment.

Pyure Dynamic Protection® provides effective solutions by neutralizing airborne chemicals and those that form on surfaces. Pyure systems have a small footprint, integrate easily into existing facilities, and operate safely around the clock in the presence of workers, thereby reducing health risks, nuisance odors, and equipment corrosion.

Pyure resolves pollutant issues across municipal and private applications:



Vapour phase odor control

Neutralize hydrogen sulfide and other pollutants

- Wastewater pump/lift stations, wet wells & headspaces
- Black and grey water tanks
- Solid waste processing



Corrosion prevention

Neutralize the compounds that cause corrosion

- Steel & iron in legacy facilities
- Concrete biogenic corrosion
- Stainless steel



Biofilm mitigation

Bacterial growth is reduced inhibiting biofilm formation

- Assists corrosion reduction
- Assists mitigation of nuisance odor
- Reduces harmful pathogen growth



Health hazards & regulatory compliance

Helps keep H₂S to levels that are safe for workers and regulated by EPA and OSHA*

*Depending on the ambient concentrations

Replicating nature to deliver safe and effective chemical and microbial treatment.

Pyure produces the same natural cleansers present outdoors in the same concentrations — ensuring effective neutralization of contaminants in the air and on surfaces in occupied spaces.

What Pyure treats:

Hydrogen sulfide

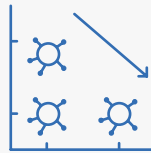
Ammonia

Mercaptans

Amines

Bacteria

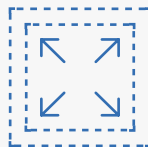
How Pyure works:



Provides superior performance in reducing pollutants in the air and on surfaces.



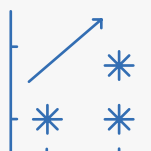
Runs continuously 24/7 while treated spaces are occupied.



Treats any size space with the same efficacy.



Delivered through an existing air handling system or installed as a stand alone solution.

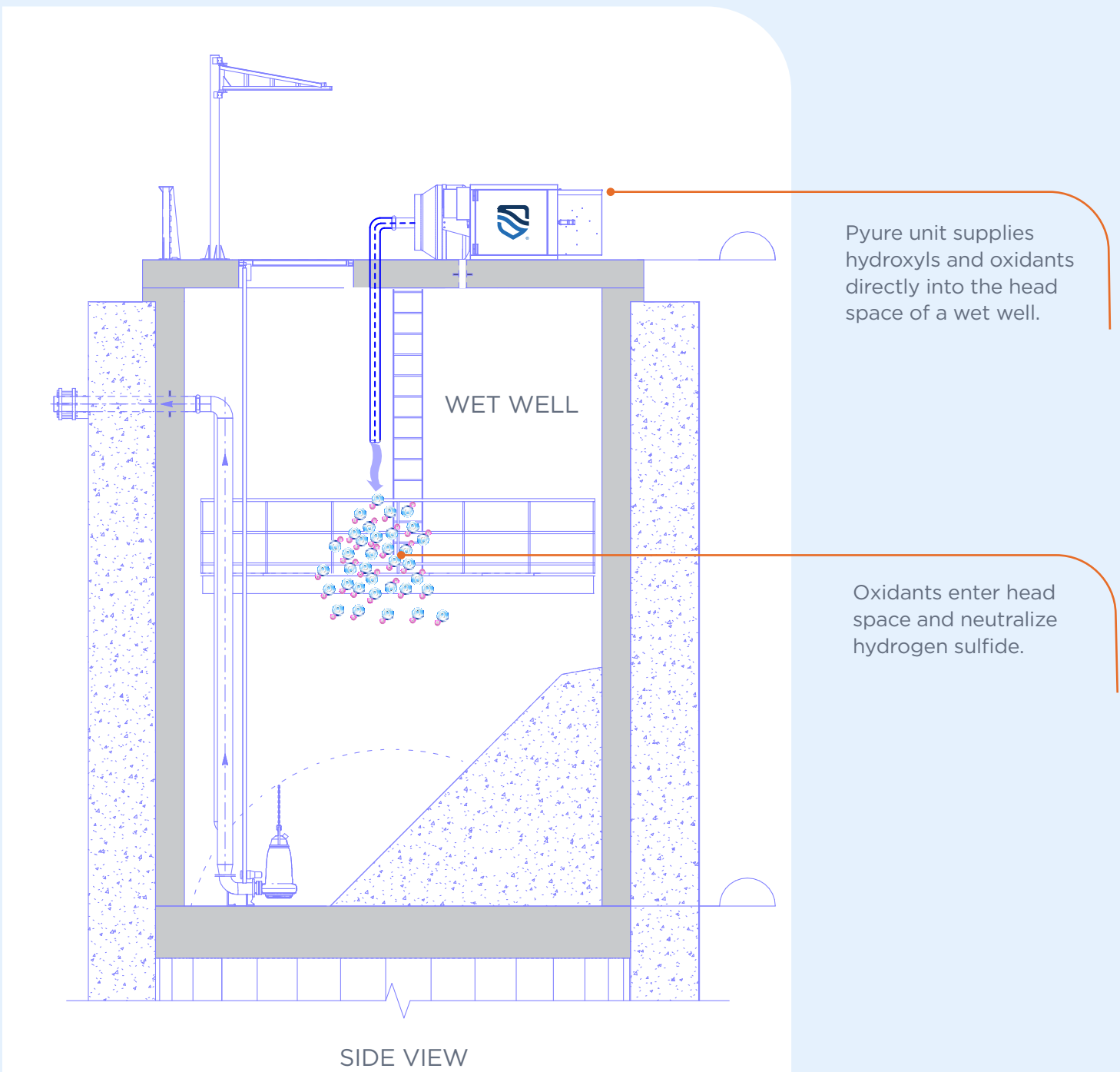


Increases the effectiveness of existing cleaning and sanitation protocols, and HVAC systems.

Natural vapor phase odor control.

Pyure technology combines specific UV wavelengths with water molecules to create hydroxyls. The hydroxyls react with volatile organic compounds (VOCs) in the air, breaking down their molecular structure and neutralizing them. The process produces powerful and stable peroxy radicals. These radicals continue circulating and replicating in the treated space, breaking down H₂S to desired levels.

SAMPLE DESIGN



Proven to reduce airborne pollutants.

Controlled atmospheric studies assessed the impact of Pyure on VOCs and the possible accumulation of chemical intermediates.

TVOC reduction
after 15 hours:

↓ 59%

No accumulation of intermediates above background levels, including:

- Formaldehyde
- Acetaldehyde
- Other aldehydes



Pyure has demonstrated significant reductions of other airborne pollutants in real-world settings:

- Hydrogen Sulfide
- Ammonia
- Ethylene
- Non-methane hydrocarbons
- Nicotine
- Chemicals produced by fires



Case studies — Hydrogen Sulfide

Problem

A sludge station treating wastewater had two sludge holding locations: an open pit (low strength) and a containment tank (high strength). Both areas' hydrogen sulfide (H_2S) levels were above safe limits, creating employee issues.

In the low-strength sludge pit, H_2S levels were consistently in the 60 PPM range, whereas OSHA limits were set at 10 PPM. In the high-strength sludge tank, H_2S levels were above 100 PPM, sometimes peaking at over 200 PPM.

The elevated H_2S levels led to offsite fugitive odors that generated frequent complaints to nearby communities, putting the facility's continued operation at risk.

Pyure impact

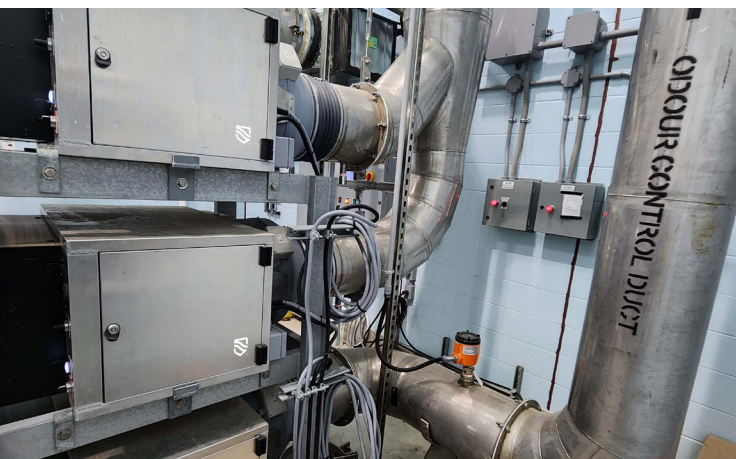
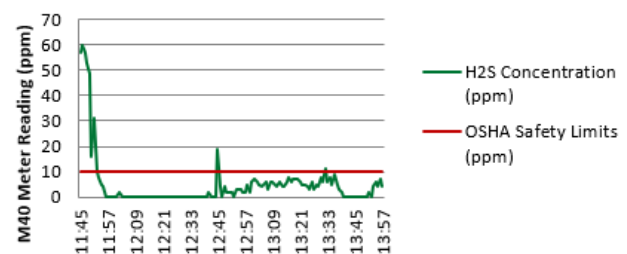
Pyure MVP14™ units were installed to treat the air above the low-strength pit and to pump oxidants into the high-strength tank. Pyure treatment quickly brought H_2S levels down below OSHA limits and kept them below 10 PPM.

Customer benefits

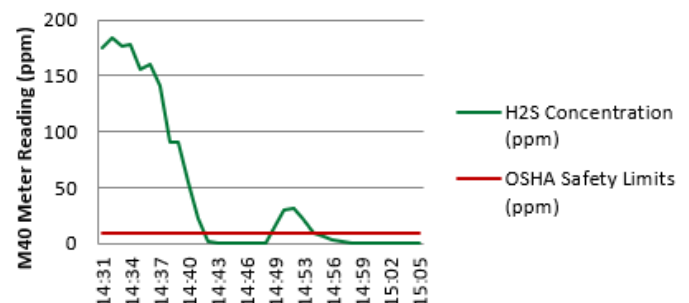
The operator of the sludge station was able to run the facility safely and in full compliance with OSHA standards, with no risk to employees. The drop in H_2S levels also significantly reduced the number of complaints, eliminating the risk that the facility could be shut down.



H_2S Concentration with Pyure Low-strength Sludge from Hill



H_2S Concentration with Pyure High-strength Sludge (tank)



Case studies — Corrosion



Problem

The Courtice Water Pollution Control Plant (WPCP) struggled with severe corrosion caused by hydrogen sulfide (H₂S) release. This gas, originating from an upper vault at the property line entry point, traveled down a hill and entered the headworks building through an air handler intake where the plant's screens, grit classifier, blowers, and grit slurry pumps were located.

Pyure impact

To prevent corrosion, the Durham region installed MVP14™ hydroxyl generators to lower the levels of H₂S reaching the headworks. These generators effectively reduced the H₂S concentration. Subsequently, the region installed IDU™ (induct) units on HVAC air handlers that supply fresh air to critical chemical storage and pump rooms. These units produce hydroxyls, which are then distributed by the HVAC system, effectively reducing H₂S and, as a result, preventing corrosion.

Customer benefits

Implementing Pyure hydroxyl technology has substantially benefited the Courtice WPCP. The most notable improvement is the significant reduction in corrosion within the plant's critical areas. By effectively lowering the hydrogen sulfide (H₂S) levels, the systems have helped preserve the integrity of metal infrastructure, reducing maintenance costs and prolonging the lifespan of essential equipment. Additionally, plant operators have reported a drastic reduction in odor and irritation they previously faced in the treated areas. Overall, the hydroxyl generators have not only enhanced operational efficiency but also improved the overall working conditions at the plant.

Metal infrastructure had its corrosion removed in the highlighted area seven years ago when the Pyure solution was implemented, demonstrating the minimal corrosion that has accumulated since.



Case studies — Odor

Wastewater treatment

Problem

A wastewater treatment plant lift station in a residential area collected incoming sewage in a large tank (wet well). The wet well was consistently emitting H₂S levels above 30 PPM, which resulted in problematic odors for nearby residents and eye and breathing irritation for employees and people passing nearby. The facility had tried to resolve the problem with liquid scrubbers, activated carbon, stacks, and chemical odor abatement, but none were effective.

Pyure impact

An MVP14 solution was installed and vented directly into a 2,000 cubic foot wet well. H₂S was rapidly broken down at the source, leading to a rapid reduction in H₂S levels, well below the 10 PPM recommended airborne exposure limit set by OSHA.

Customer benefit

The offensive odors were eliminated, and the health risks for employees and people near the facility were mitigated. Eliminating the other odor abatement systems led to reduced energy consumption, lower operating costs, and a rapid return on investment.



Black and grey water tanks



Problem

Maritime vessels faced multiple odor issues, primarily from smells emanating from wastewater in the grey and black water tanks and VOCs from the engines rooms and fumes from the galleys. Additional challenges included viruses, bacteria and mold in owner and crew private and public spaces.

Pyure impact

Pyure devices were installed directly alongside black and grey water tanks, treating the air in the tanks and eliminating the odor before entering the rest of the ship. Additionally, Pyure IDIs™ were added to the HVAC systems as a sanitization solution to treat viruses, bacteria and mold and eliminate the remaining odors from VOCs and fumes.

Customer benefit

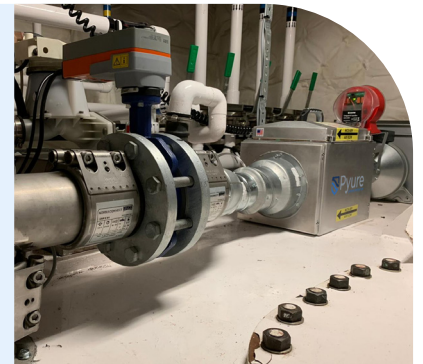
The odors were drastically reduced in all affected areas and viruses, bacteria and mold were mitigated:

“Crew says they love the new fresh air. It makes them feel more alert during the day and sleep better at night.”

- Captain Graham

“We ran tests with grey, and black water smells at our testing station in Hamburg. The results are very impressive - like nothing we have ever seen before. We believe this is the new industry standard.”

- Uwe Fredrich, Sales Director, Hamann AG



Case studies — Solid Waste

Garbage storage & compacting room



Problem

An office building with a centralized garbage room had strong odors permeating the building, causing tenants to complain. An air conditioning system installed in the garbage room had cost over \$4,000 per year in energy consumption, with limited impact on garbage odors.

Pyure impact

Pyure units were installed in the garbage room, and the air conditioning units were turned off. Within a week, there was a noticeable reduction in odor, and after three weeks, the odors were mitigated, and the tenant's complaints ceased.

Customer benefit

The building owner generated a better experience for tenants and eliminated odor complaints. The savings in energy consumption paid for the Pyure solution in less than a year and helped to protect the rental value of the building.



Municipal solid waste facility



Problem

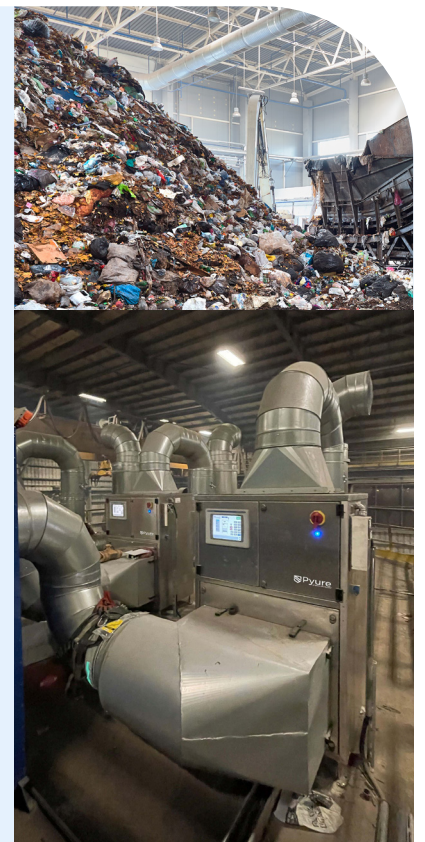
A significant size waste management facility treated all the municipal solid waste generated by a large, nearby city. The facility was subjected to frequent complaints from nearby communities concerning odors, resulting in frequent government fines and the threat of a shutdown.

Pyure impact

Pyure units were installed in the waste reception area, where garbage trucks dumped incoming waste for sorting and treatment. Following the installation, the facility saw a 90% reduction in odor and a 25% reduction in total organic compound levels (TOC), leading to better compliance with government requirements and a significant decrease in complaints during peak odor periods.

Customer benefit

The facility could turn off its exhaust system at night, eliminating emissions into neighboring communities while maintaining TOC and odor levels inside the plant within acceptable limits. By turning off the exhaust system, total plant emissions were cut significantly, and the consumption of expensive activated carbon filters was reduced considerably. The payback period for the Pyure system was less than a year, complaints and fines were minimized, and the risk of a shutdown was mitigated.

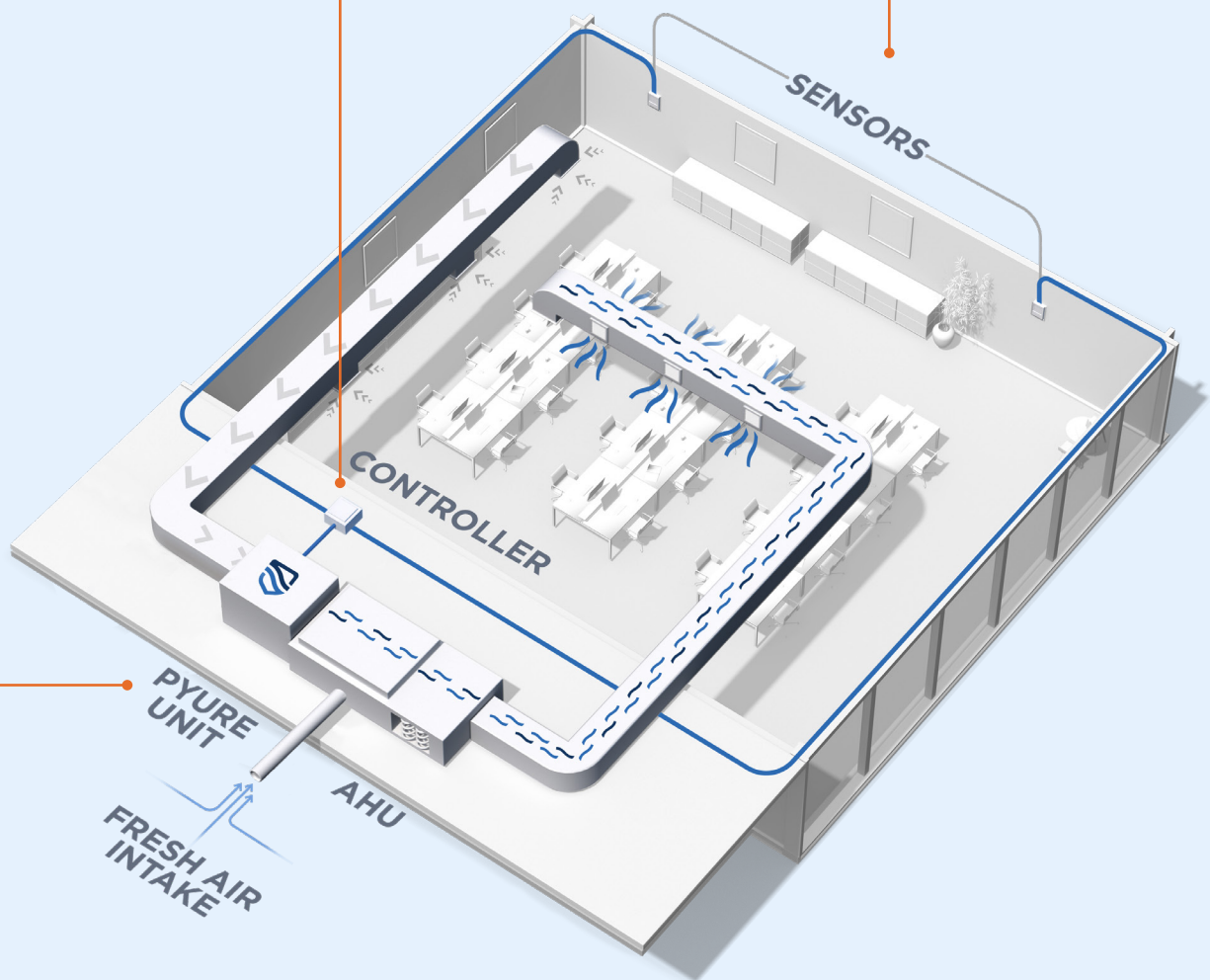


Optimized air quality.

Our completely scalable and sensor driven systems offer customizable controls and helpful data analysis to measure and optimize performance. The Pyure system continuously adjusts as the demand for purification changes over time, ensuring optimal safety, performance, and energy efficiency.

Controller responds to sensor readings and modulates the Pyure device to treat the real-time air quality.

Sensors provide real-time reading to controller.



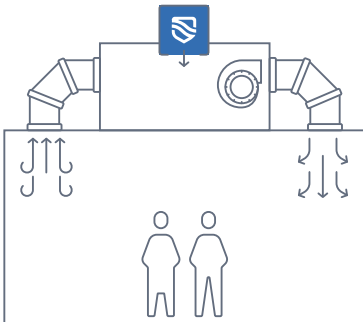
Pyure unit works with single or multiple air handling systems.

Hassle free installation and upkeep.

Pyure solutions can be installed with or without an air handling system.

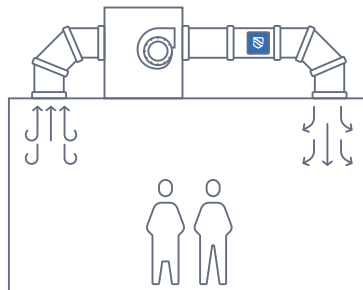
Centralized air handling

- Large rooftop units
- Large indoor units



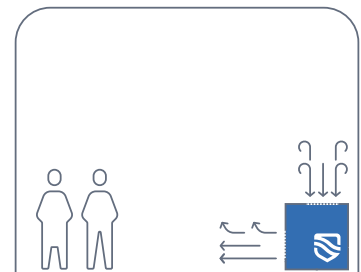
Decentralized air handling

- Smaller units inserted in ducts throughout the building
- Wall mounted units where there is no ductwork



No or limited air handling

- Large stand alone units with blowers
- Portable, stand alone units
- Wall mounted units



Pyure makes maintenance easier.

Little impact on existing air handling system

- Minimal increase in airflow resistance
- Virtually no extra wear and tear
- Marginal impact on energy consumption

Low frequency maintenance and a system that helps clean

- Annual replacement of UV optics and sensors
- Periodic cleaning of filters (frequency depends on the dust and oil concentrations in the air)
- Reduces the frequency and intensity of duct decontamination



Controlled solutions.

Designed to treat even the largest of spaces, our controlled solutions work with new and existing air-handling systems. Sensor-driven with customized controls that respond to real-time data.



Pyure IDI™ Purifier

A versatile solution that fits into the ductwork of any air handling system. Connect with more IDI units to increase the treatment area.

TYPE: Indoor, inline with HVAC

NOMINAL TREATMENT AREA: 3,000* sq ft



Pyure MVP16™ Purifier

Integrates into a new or existing air-handling system where space is limited and provides more cleansing power than induct systems.

TYPE: Indoor, inline with HVAC

NOMINAL TREATMENT AREA: up to 85,000* sq ft

BLOWER: optional



Pyure MVP24™ Purifier

A heavy-duty unit built with a reinforced shell suitable for outdoor applications.

TYPE: Rooftop, inline with HVAC

NOMINAL TREATMENT AREA: up to 200,000* sq ft

BLOWER: optional



Pyure MVP48™ Purifier

Our most powerful system, the MVP48™ purifier is ideal for the largest installations.

TYPE: Indoor, inline with HVAC

NOMINAL TREATMENT AREA: up to 450,000* sq ft

BLOWER: optional



Insight Edge™ Controllers

Controllers modulate purifiers based on feedback from the sensor system, creating an efficient method of treating pollutants in the space.



Sensor system

Air sensors placed throughout the environment send readings to the sensor system which provides constant real-time feedback to the control system.

Non-controlled solutions.

The simplest to install, our non-controlled products can be added to air ducts, wall mounted or plugged into a standard outlet. Switch them on for instant air purification and surface cleaning in small to medium size environments.



Pyure Mini® Purifier

The Mini series is designed to fit in with its small proportions, modern design and low noise levels. This makes it ideal for cleaning and deodorizing air in offices, waiting rooms or any other small commercial space.

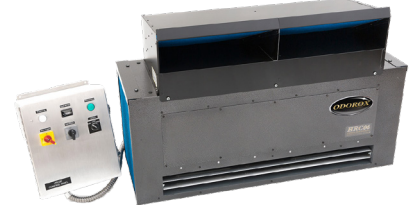
TREATMENT AREA: up to 500* sq ft



Pyure IDU™ Purifier

The IDU purifier is a duct mounted purifier that is easy to install and requires only an electrical connection for operation.

NOMINAL TREATMENT AREA:
2,000* sq ft (model dependant)



Odorox® HRC06™ Air Purifier

The HRC06 purifier is wall mounted and can modulate its output to purify and deodorize commercial and industrial applications.

TREATMENT AREA: up to 6,600* sq ft



Odorox® Slimline™ Purifier Family

Rugged purifiers with a durable exterior beneficial for public spaces and commercial or industrial installations that require a portable unit.

TREATMENT AREA:
up to 900 - 1,500* sq ft



Odorox® Boss™ Purifier

Designed for tough environments, the Boss purifier is suited to applications like remediation following fire or water damage. It's also ideal for areas with frequent movement and contact.

TREATMENT AREA: up to 2,500* sq ft



Odorox® Boss XL3™ Purifier

By adding an external fan to provide greater air movement, the Boss XL3 purifier is ideal for spaces that have been affected by smoke, flooding, wastewater, and other air pollutants.

TREATMENT AREA: up to 3,250* sq ft

Let's discuss a solution tailored to your needs or plan a trial.

At Pyure, we're dedicated to finding the right solution for solving your challenges and delivering the outcomes you need.

Get in touch to find out more about how we can help.

sales@pyure.com
1-877-735-3701

Who we work with:



pyure.com | [@pyureco](https://twitter.com/pyureco)

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