



# Evacuator System Owner's Manual

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## Owner's Operation Guidelines

Congratulations on your recent purchase and installation of a Paddock Evacuator® Source-Capture System. The Evacuator is an engineered solution designed specifically for your facility to work with your mechanical (HVAC) system to eliminate and/or prevent air quality issues. Evacuator Technology source-captures and exhausts heavy trichloramine-laden air and other disinfectant by-products (DBPs) directly from the pool's surface and wet deck before this contaminated air can be recirculated through your mechanical system. We appreciate your commitment to healthy air quality.

### Evacuator Design Specifications:

#### Your Evacuator System includes:

- ☐ Integral Gutter Evacuator System
- ☐ Modular Deck Drain + Evacuator System
- ☐ Fiberglass Evacuator Bench / Wall-Mount System
- ☐ PVC Evacuator Bench System
- ☐ Exhaust Fan Model: Greenheck
- ☐ Variable Frequency Drive (VFD) Model
- ☐ Natabot Evacuator Control Panel

## Maintenance for Evacuator System

### Integral Gutter Evacuator System

- See Stainless Steel Products Care & Maintenance and Grating High Density Polyethylene (HDPE).

### Modular Deck Drain + Evacuator System

- Rinse with fresh water after cleaning the pool deck to ensure no dirt or debris is left on the surface on the grating.
- Large debris should not be washed into deck drain. The risk of poor drainage or drain blockage could create an issue of water pooling on the deck and become a hazard to pool staff and patrons.
- Using a 3/16" hex driver, check the cam-lock screws occasionally to ensure they are still tightened as desired. **Cam-lock screws are nylon material**, be careful not to over-tighten as the screw may be broken.
- If stains are present, use a cleaner such as Soft Scrub® and a nylon scrub brush. Scrub lightly as excess force could mar the finish. Do not use 100% chlorine, as commonly used to treat a pool, to clean a persistent stain. Rather, soak the area in bleach.
  - Do not use MEK, turpentine, or naphtha solvent. For additional information for care & maintenance of the HDPE Grate call Paddock Pool Equipment Company.

### Fiberglass Evacuator Bench or Wall-Mount System

- Rinse with fresh water and hand dry weekly to maintain clean, spot-free surface.
- Polish with fiberglass wax twice a year to maintain gloss.

### PVC Evacuator Bench System

- Rinse with fresh water and hand dry weekly to maintain clean, spot-free surface.
- Use a non-abrasive mild detergent and cloth as necessary for cleaning.

### Exhaust Fan Model: Greenheck

- Maintain as defined by Manufacturer's Installation, Operation, and Maintenance Manual.
- Exhaust fans may require routine maintenance procedures. Reference manual as needed.

### Variable Frequency Drive (VFD) Model:

- Maintain as defined by Manufacturer's Operator's Manual.
- Owner to determine adequate operation levels at different load periods and document the appropriate settings. These VFD settings can be posted in the facility operating manual. Typical modes / operation levels may include:
  - Unoccupied Mode: facility may be closed during this time.
  - Occupied Mode / Normal Operation: typical every-day use, normal "business" hours.
  - Event Mode / High-Use Operation: swim meets, high-use periods, large bather loads.

### **Natabot Evacuator Control Panel**

- ~~This control system was designed by Thermal Conditioning Inc. in partnership with Paddock Pool Equipment Company. This system utilizes a high performance CPU in combination with a user-friendly interface which allows for responsive and accurate control of your natatorium's air quality. Predictive algorithms and real-time accurate data are utilized for tighter condition control. Web Access is available via an app on smart phones & tablets or utilizing an outside IP via computer.~~
- Indicates space occupancy by detecting human-generated VOCs (volatile organic compounds).
- VOC output allows you to ventilate using ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality. VOC Meter can be configured as on-demand controlled ventilation.

## **Pool Maintenance**

### **Pool**

- Vacuum regularly to keep organics off pool bottom.
- Backwash to remove accumulating organics in the sand filters as recommended by manufacturer.
- Recharge regenerative media filters regularly to remove accumulated organics as recommended by manufacturer.

### **Pool Deck**

- Wash down pool deck regularly to remove organics that are brought into the facility by patrons & guests, which are also produced as a result of facility use by patrons.
- Use non-oxidizing cleaning solutions to clean deck.
- Clean deck drains periodically to remove build-up of organics.

### **Pool Deck Equipment**

- Rinse and clean deck equipment on a regular basis to remove build-up of organics and corrosive condensate from chloramines and DBPs.
- Periodically wipe down stainless steel goods to remove caustic residue. Apply polish to stainless steel deck equipment, doors, water fountains, and any other fixtures that may be affected.

### **Patron Hygiene Program**

- An effective patron hygiene program will greatly improve air and water quality, along with the staff and user experience.
- Post facility signage to encourage good personal hygiene program
- Swim Coaches can give swimmers breaks every 30 to 60 minutes. Urine is a major contributor to organic loading of a pool and a source of eye and skin irritation.
- Parents can schedule "out of pool" snack time that gives children a chance to use the restrooms.
- Facility Managers can schedule "Adult Only" swim time every hour.
- Everyone can help by encouraging showering and bathroom use before entering the pool, water park, spa, or any body of water within an aquatic facility.
- Maintain a "clean pool deck" policy: no street shoes, glass, food allowed on deck, etc.

**Clean facilities are safer, more attractive, and provide a more enjoyable experience for all.**

## Pool Water Considerations

### Filtration:

- A properly functioning filtration system is essential to providing patrons a clean, healthy swimming environment. A well-functioning filtration system includes an accurately sized filtration system with an appropriate filter bed, proper turnover rate, and filter media to be in good condition.

### Chemical Feed System

- Chemical Controller capable of controlling sanitizer (ORP readings) & pH levels.
- Chemical feed system that provides a controlled feed rate of sanitizing and pH controlling chemicals on demand as needed.

### Secondary Pool Disinfection

- Secondary disinfection systems can be added for additional layer of sanitation and also chloramine reduction at point of contact. Systems must be maintained on a regular, scheduled basis per manufacturer's guidelines for optimal operation and disinfection.
- Enzymes: supplementing your water chemistry program with Orenda™ Technologies Catalytic Enzymes will encourage the bio-oxidation of organic contaminants commonly found in pools, spas, and other recreational water systems. These enzymes naturally consume and digest oils and organics allowing your sanitizer (chlorine/bromine) to be more effective. Proper use of enzymes can also reduce chloramine production.

### Water Chemistry

- See Section 1 on Table of Contents, Special Instructions – Pool Chemistry & Sanitation

## Air Quality Recipe for Success

### Introduction:

Most indoor swimming environments pose a challenge for owners and operators due to the multitude of factors that are required to provide a safe, comfortable swimming environment. Treating pool water with an oxidizing sanitizer is a must for maintaining healthy pool water. Unfortunately, there is a resulting reaction which causes issues for most indoor swimming environments.

All pools generate off-gassing Disinfectant By-Products (DBPs) as a result of oxidizing chemicals (chlorine/bromine) doing what they are supposed to do: **Oxidize Organics**. Organics could be defined as common foreign objects introduced to the pool: dirt, hair, skin cells, saliva, urine, etc. The issue relative to indoor pools and oxidizing organics is where these DBPs go and what impact they are having on the following: Patrons & Staff, Facility & Replacement Costs, Operating Costs, and Reputation.

### Facts:

- Swimmers introduce organics into pools and onto pool decks which must be oxidized in order to maintain a healthy environment.
- The oxidation process results in DBPs off-gassing from the chlorinated pool water, including water splashed onto pool decks as well as aerosoled through water features.
- Traditional indoor aquatic facility HVAC systems are designed to heat, cool, and/or dehumidify natatorium air. They also are designed to introduce outdoor air (dilution) on an as-needed basis.
- The combination of chlorine oxidizing organics, DBPs off-gassing from the water's surface & pool deck, and the HVAC re-circulating DBP-laden air, creates a compounding effect of the contaminated air, which all contribute to a "Poor Indoor Air Quality Cycle".

### Water & Air: Bridging the Gap

A swimming pool's water purification system, operating procedures, and resulting water quality conditions serve as the foundation for a natatorium's overall environment. Water temperature, filtration effectiveness, water chemistry conditions, chemical feed systems, types of chemicals, supplemental disinfecting equipment, facility maintenance procedures, and the organic load in pool water (clarity is an indicator) all contribute to the health of the pool water in both a positive and/or negative way. A swimming pool is a living biological 'science project' and requires consistent professional maintenance to stay ahead of compounding issues.

A natatorium's mechanical system provides patron comfort in the natatorium. This depends on operating parameters, equipment condition, and engineered airflow. The equipment must be designed properly and maintained on a regular basis to ensure proper effective operation.

## Facility Air Considerations

### Mechanical System Design & Operation

- |   |                   |
|---|-------------------|
| • Proper Airflow Rates:                             | Design Parameters |
| ○ Total Airflow                                     | _____             |
| ○ Supply Air  | _____             |
| ○ Exhaust Air                                       | _____             |
| ○ Outdoor Air                                       | _____             |
| ○ Evacuator Exhaust                                 | _____             |
| • Duct System Design                                |                   |
| ○ Proper Return & Supply Distribution               |                   |
| ○ Avoid Dead Spots, Stratification, & Zonal Effects |                   |
| ○ May Need Supply Register Adjustments              |                   |
| ○ May Need Supplemental Directional Fans            |                   |

## Secondary Facility Air Disinfection

- Cold Plasma Ionization: Located within the Pool Dehumidification Unit (PDU), this system disinfects and reduces VOC (volatile organic compound) levels in the air being recirculated in the indoor aquatic environment. This technology creates positive and negative ions, which are drawn to airborne particles due to their polarization, making them larger and increasing the effectiveness of filtration. In the same manner, they attach to pathogens such as viruses, bacteria, and mold spores, robbing and deactivating the hydrogen component of the pathogen creating a cleaner/safer environment. It also has additional air quality improvements such as odor control and reducing allergens. The use of the Cold Plasma system will also allow you to run your outside air at lower levels when conditions warrant it, saving energy.

## System Balance:

Paddock Evacuator Technology is designed to complement the operation of the existing mechanical system. Upon installation of Evacuator Technology, the owner/operator should consult his servicing mechanical contractor to balance the existing mechanical system's exhaust rate with that of the Evacuator.

## Balance Mechanical System to:

- Chloramines are produced and released into the air in aquatic facilities at all times, even during unoccupied times.
- A recommended 0.05"—0.15" WC negative pressure must be maintained in the natatorium air space at all times. This keeps the 'pool [corrosive air] in the pool [environment].'
- Maintain outdoor air introduction through the existing mechanical system as designed by a professional mechanical engineer and/or manufacturer's recommendations and at least the ASHRAE minimum outdoor air standard, unless otherwise specified.
- **Opening doors and windows are not recommended, as this can overload the mechanical equipment, interrupt the intended air flow patterns, and/or create an environment with bad (or worse) air conditions.**
- Owner/operator may reduce exhaust air further in the existing mechanical system during off-hour / unoccupied times to recover energy costs as design allows. Technology now exists that allows facilities to run below ASHRAE minimum outdoor air volumes based on certain criteria.
- Reduce the exhaust rate of the existing mechanical system as required. In some cases, the exhaust fan(s) in the existing mechanical system may be shut down completely as Evacuator Technology may handle 100% of the required exhaust.
- Source-capture exhaust removes a much higher amount (percentage) of airborne chloramines and other disinfection by-products per CFM exhausted than conventional return exhaust.
- Turn off / disconnect supplementary exhaust fans in the space, per design. The majority of exhaust will typically be through the Evacuator, unless otherwise designed. Please check with your installer or the supplied drawings to verify this information.
- **The Evacuator should run 24 hours per day, 365 days per year.**



### **Owners Responsibility & Suggested Operating Guidelines to Complement Evacuator Technology:**

- Ensure Evacuator is running at all times: 24 hours per day, 365 days per year. If Evacuator is deemed to not be operational, contact Paddock or your local mechanical representative immediately.
- Reduce organics introduced into the pool area by enforcing aggressive patron hygiene and maintenance programs.
- Maintain pool water chemistry based on the guidelines provided above.
- Maintain Evacuator, Pool, & Mechanical System as outlined above for best results.
- Balance existing mechanical system to ensure a recommended 0.05"—0.15" WC negative pressure exists in the facility.
- Maintain existing mechanical system to ensure proper airflow and outdoor air introduction as designed per the facilities operating parameters.
- HVAC Maintenance Company / Mechanical Contractor is scheduled to provide routine maintenance as defined by the mechanical equipment manufacturer. Preventative maintenance is key!