MASCon®2.0

Operating Instructions and Maintenance Manual

Preface

MASCon stands for Micro Aeration Sludge Consolidation. The MASCon®2.0 uses a diffuser connected to compressed air to produce micro bubbles which improves the efficiency of floatation consolidation systems.

Benefits of the MASCon®2.0 may include improved removal efficiencies, increased throughput, decreased maintenance requirements, lowered energy consumption, improved floatation efficiency, reduced disposal costs, and more optimized chemical usage.

This manual has been developed to provide the operator with a conceptual background of physical and chemical separation mechanisms, parts list, and maintenance procedures.

Contents

Introduction

The MASCon®2.0 is a supplementary aeration system which is added to the ALSI Palin® Paint Sludge Consolidation tank. The key to the system is the unique diffuser which uses compressed air to create microbubbles to significantly improve floatation of suspended solids in the Palin®.

Applications Include:

- ALSI Palin® Paint Sludge Consolidation
- Floatation
- Oil/Water Separation
- Wax Removal

ALSI Capabilities Include:

- Total System Design
- Retrofit Existing Equipment
- Design and Build Customized Turnkey Systems

Safety

To ensure maximum safety and to gain knowledge of this product, it is important that any operator of the MASCon®2.0 read and understand the contents of this manual and the solution the product is operating in before the equipment is operated.

The precautions mentioned in this manual are not intended to cover all the warnings or hazards which can exist in a plant or in these systems. Using this equipment safely requires the attention of everyone near the machines. Strong safety practices must be used by plant personnel for this system or any other equipment. Proper equipment maintenance and use of personal safety devices contribute as much towards safety as any number of mechanical safety devices.

Study this manual thoroughly before attempting to install, operate, or maintain this system. The plant is to make sure that the contents of this operation manual are fully understood by the personnel, and that they are qualified to operate them.

Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, then they must be trained and instructed by qualified personnel.

Technology and Design

The keys to a well performing MASCon®2.0 are as follows:

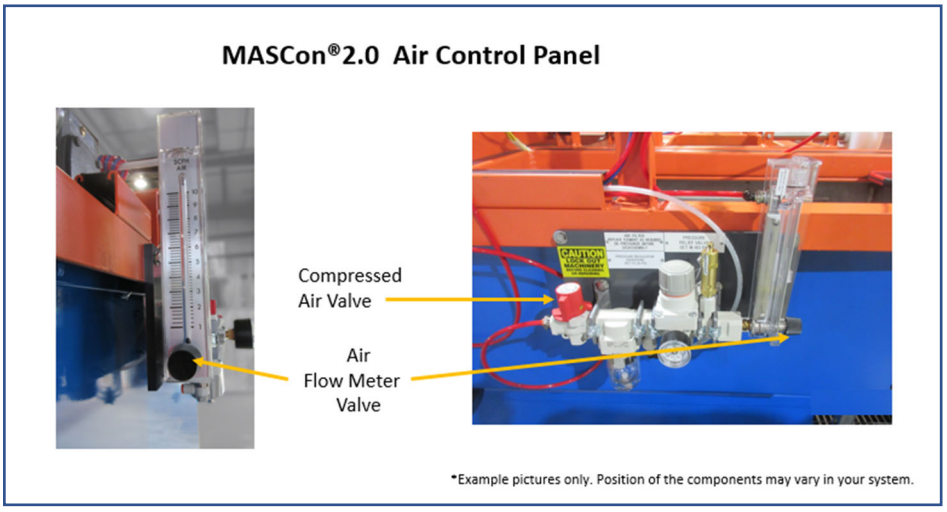
1. Saturation
    a. With high air/water saturation efficiencies, less energy is required, and less water is required to recirculate in the system. Recirculation of water in the unit reduces retention time, thus limiting capacity and/or performance. The MASCon®2.0 increases efficiency by improving the recycle rate of the water.
2. Bubble Size:
    a. The size of the microbubbles generated is a key to good performance; the smaller the bubble, the smaller the particle that can be removed. If smaller particles can be removed, less chemistry is necessary to coagulate the products into a large particle. Besides the operational cost savings, reduced chemical consumption can yield dewatering benefits.
    b. Many systems create 100+ micron bubbles. The MASCon®2.0 creates bubbles size distribution between sub-micron to about 250 microns.
3. Maintenance:
    a. The air dissolving technique must not be maintenance intensive. This is a critical part of the clarification process and must be reliable. Many systems are not reliable. The MASCon®2.0 is robust and highly reliable in a wide array of applications.

System Operation

Start-Up

1. Verify installation per installation drawing.
2. Verity that the Palin® pump is on and that there is flow to the overflow weir.
3. Turn on compressed air to the MASCon®2.0 by using the red compressed valve on the MASCon®2.0 control panel.
4. Set pressure to 30psi by using the pressure regulator on the same control panel.
5. Slowly open the air flow meter valve until a value of 2-6 SCFH (for size 200) or 4-12 SCFH (for size 400) is achieved.
6. Bubbles will begin to form in the tank.* It may take some time for the bubbles to begin forming; this is normal and does not indicate a problem.

   **If submerged for over 2 hours prior to start-up, it may take up to 2 minutes for full flow through the diffuser.*



Operation

Once properly set, the system should operate continuously without major adjustments.

Note: The MASCon®2.0 should remain on when solution is flowing through the Palin® to prevent buildup of solids on the diffuser.

Shutdown

1. In the case of a system shutdown, a procedure should be followed to ensure an easy restart (avoid Palin® filling with solids).
2. Stop the equipment which feeds water to the Palin®.
3. Move and position scraper away from the home position to the beach end. Follow safety protocol and lock it out.
4. Turn off the compressed air to the MASCon®2.0 by using the red compressed air valve on the MASCon®2.0 control panel.
5. Disconnect and lockout electrical system.

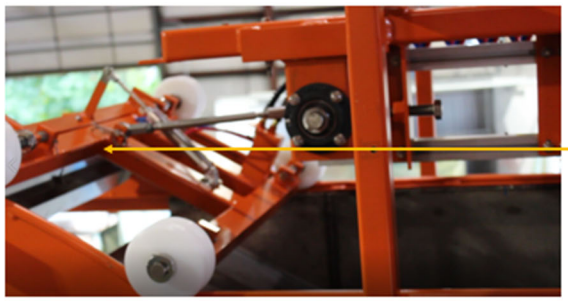
Maintenance & Cleaning

The MASCon®2.0 is designed for durability and long life. However, following some basic maintenance and cleaning procedures will assure the long life of the system.

- It's necessary to check and clean the MASCon®2.0 diffuser **every three months**. Cleaning will be required more frequently with foul water.
- It is recommended that the system be protected from freezing temperatures as water in the pipes and other areas may freeze and expand, causing damage.
- Do not expose the diffuser to temperatures above 140ºF (60ºC) as it will weaken the resin and cause cracks.
- Avoid physical shock (i.e., dropping) as this may cause damage or breakages. Always handle with care.

Remove the MASCon®2.0 diffuser for cleaning by using the following steps:

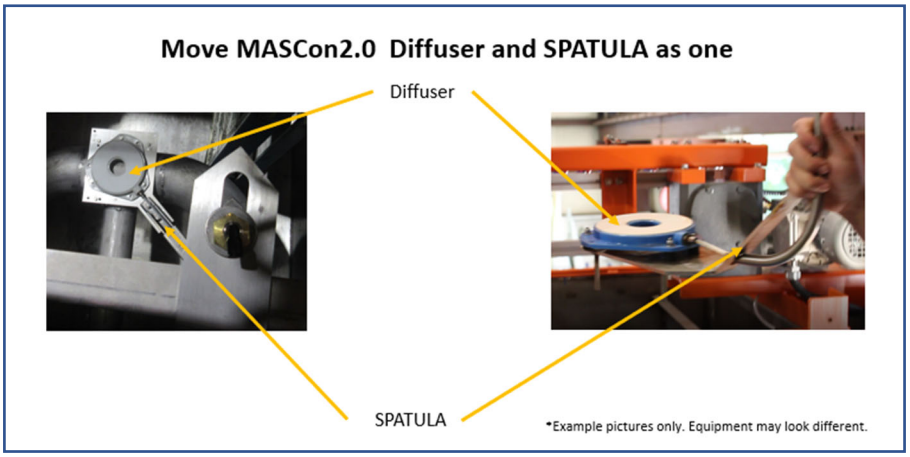
1. Remove scraper side guard if applicable.



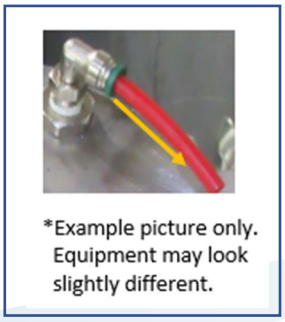
*Example pictures only. Equipment may look different.

2. Close the flow meter valve on the MASCon®2.0 control panel.
3. Shut off compressed air to the MASCon®2.0 by using the red valve on the MASCon®2.0 control panel and lockout the red valve.
4. Drain the Palin® tank until the water level is below the MASCon®2.0 diffuser.
5. Ensure electrical controls are turned off and locked out.

   Note: The MASCon®2.0 diffuser is secured inside the Palin® tank using a device called the 'Supporting and Protecting Aeration Transfer and Underwater-Lifting Apparatus' (SPATULA). It is not necessary or advisable to remove the MASCon®2.0 diffuser from the spatula. The MASCon®2.0 diffuser and spatula should be removed as a single unit when cleaning.



6. Disconnect air hose from the top of the spatula's handle.



7. Carefully lift the spatula and MASCon®2.0 diffuser out of the Palin® tank for cleaning.

*Example picture only.
Equipment might look slightly different.

8. Once the spatula is out of the tank, place it on a clean cloth/towel.
9. Wipe clean the diffuser with a soft sponge and fresh water is recommended. Cleaning will be required more frequently with foul water.
10. After cleaning the MASCon®2.0 diffuser, reinstall by following these steps in reverse order.

    For SERIOUSLY SOILED SURFACES follow the next steps:

    A. Using a spare plastic tube reconnect the MASCon®2.0 air hose to the Palin's compressed air.
    B. Open the red valve on the MASCon®2.0 control panel and turn on compressed air.
    C. Verify regulator pressure is 2.5 bar (30 to 36 psi).
    D. Open rotameter (full flow rate). You will see foaming on the ceramic surface, this pushes most water from the ceramic membrane, called purging.
    E. Clean the surface as best possible by wiping it with clean cloth/towel, after about 60 seconds close the air supply, the diffuser will now be dry enough for further cleaning. Soaking the diffuser in a 10% Hydrochloric Acid (HCI) solution overnight works well to remove salt deposits and organic matter.
    F. If the above cleaning does not work, use the 1000 grit sandpaper on the ceramic surface while its foaming during purging, this removes any build up on the surface and prevents anything from entering the pores while cleaning. Rinse the diffuser regularly or, if possible, do the sanding under water in a bucket. Do so until the surface is clean and reasonably white again.

G. In some extreme causes, soaking the diffuser in a 10% Hydrochloric Acid (HCl) solution overnight also works well to remove organic matter. This does not affect the diffuser seals or anything. It needs to be flushed properly before returning it to use. **Important Note:** Do not use soap or detergents as they may block the ultrafine pores.

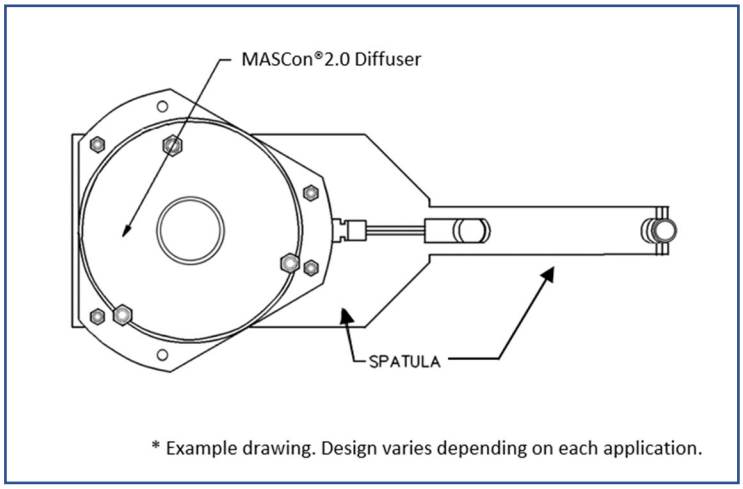
H. To get the MASCon®2.0 back to the tank, shut off the compressed air by using the red valve on the MASCon®2.0 control panel and lockout the red valve.

I. Disconnect the MASCon®2.0 air tube from the spare plastic tube.

J. Reverse steps above for reinstallation.

Appendix

Diagram of MASCon®2.0 Diffuser with Spatula



* Example drawing. Design varies depending on each application.

Customer Service

ALSI believes that responsive customer service is as important to customer satisfaction as is the proficiency of the system design.

We welcome customer calls.

For customer support call: 248-656-3610