Marsh Nutra-Lite SBR

Installation Guide

Marsh Industries Ltd. Addington Park Industrial Estate, Little Addington, Kettering, Northamptonshire, NN14 4AS. Tel:01933 654582

The Marsh Nutra-Lite SBR wastewater treatment plant is the latest innovation by Marsh Industries. The plant is a two chamber system and is controlled by the Marsh Nutra-Lite SBR controller. Please read this entire guide before starting the installation.

Caution:

The following notes are critical to the correct functionality of operation and installation.

1. **All electrical installations and connections must be carried out by a suitably qualified person.**
2. **The controller should only be powered off by shutting down the controller correctly. Hold the OK button for 3 seconds and disconnect the mains when instructed to do so.**
3. **Do not power off by unplugging the mains or removing the batteries.**
4. **Do not remove the cover in an environment where water may enter the controller.**
5. **Do not make changes to the programming of the controller unless you are instructed to do so by a Marsh Industries representative.**

Basic Installation.

There are very few steps required for the basic installation. The controller is pre-programmed for operation and only requires connection to the mains supply, air hose connections and the compressor electrical connection to the controller.

1. Mount the controller in a dry environment within 10 meters of the plant
2. Connect the air hose from the compressor to the ½ inch connection on the controller
3. Connect the compressor power cord to the controller
4. Connect a high level float switch
5. Connect the four air hoses from the controller to the plant
6. Turn on the controller

In more detail

1. The controller is supplied with a mounting bracket. This should be fastened to a stable surface using suitable fixings (not supplied). The controller is not waterproof or rated to be located in a damp or wet environment. Under certain circumstances, the controller may need to be operated with the cover removed, for example, during an Operating System update or upgrade. The controller operates from Mains electrical power and only a suitably qualified person should attempt any installation or alteration.
2. The compressor should also be positioned in a clean and dry environment close to the controller. The outlet from the compressor should be connected to the large hose tail connection on the controller with 19mmID flexible hose and secured with suitable hose clips.

3. Remove the four retaining screws from the underside of the controller cover. Only the four screws in the corners need to be removed. Be careful not to damage or put tension on the ribbon cable joining the display panel to the controller. Remove the black plastic cover from the right hand side to gain easy access to the cable way. Pass the compressor power cable through the side of the control panel and connect the compressor live wire to **OUT5.** Connect the Earth to **PE** and Neutral to **N**.
4. Connect a high level float switch to **D1 (or In1)** in the left hand side of the control panel. Remove the black cover from the side to ease installation. Replace both side covers, left and right, and replace the control panel cover and retaining screws.
5. There are four ¼ inch hose connectors on the control panel. They are connected as follows, left to right.
    1. Fill - to the pipework fill system in the first chamber
    2. Discharge – to the pipework with the ball valve assembly
    3. Sludge return – to the pipework with the large perforated pipe
    4. Aeration / mix – to the diffuser in the base of the tank.

    Secure all hoses with suitable pipe clips.

6. Plug in the power lead for the controller and the controller will start.

What happens next?

The first operation of the controller will be Discharge. That is, to empty Clearwater from chamber 2 to ground. The reason for this is that if a controller is off for more than an hour, as it obviously has been while in transit, the first operation is to prepare the plant ready for more inflow. This behaviour is normal so that in the event of a power failure lasting more than an hour the plant prepares for inflow. During this hour (or longer) there will have been no activity so the second chamber will have been settling as it would in normal operation.

Clearwater / discharge normally operates for approximately 15 minutes for a standard program and will run for this time or until the pre-programmed level is reached in the second chamber. The controller has a built in air pressure monitor that monitors and records the operating pressure of each of the processes listed above 5.1 to 5.4. The controller program has a setting that is configured to control the low level of the Clearwater operation.

Float switches, Section 4 above, do not have any control over the Clearwater process. Clearwater is controlled by the pre-programmed time (usually 15 minutes) or the minimum pumping pressure set in the controller program. Clearwater will end when either the programmed time or minimum pressure is reached, whichever occurs first.

The controller will now start to run the standard SBR process.

Standard SBR process

After Clearwater, the controller will run the normal complete cycle.

The fist process is **Fill**

Effluent will be pumped by Air-Lift to refill chamber 2 from chamber 1, usually 15 minutes. The process measures the water level using air-pressure monitor.

The second process is **Denitrification**

This is mixing using the diffuser and then air off for periods of time. This will be short periods of air and longer periods with no air.

The third process is **Aeration**

This is long periods of aeration to saturate the water with oxygen for Nitrification.

The fourth process is **Settling**

This is to allow any solids to settle at the bottom of chamber 2 before Clearwater discharge.

The fifth process is **Sludge Return**

It's important to know that sludge return will not take place for 90 days. This is to allow build-up of bacterial biology in the second chamber.

The sixth and final process is **Clearwater**, the discharge of clean treated effluent to ground.

Please note

All of the processes operate using air from the compressor. During each process, the air pressure is measured and recorded for level measurement and fault diagnosis. The pressure is also used for automatic calibration of the plant and for activating ECO mode. Automatic calibration will take place after 14 days. The active process and pressure is displayed on the controller.

Most of the settings of the program can be altered directly on the control panel but this should not be necessary as the controller is supplied pre-programmed.

Also supplied with the controller is a Marsh Industries (Marsh) memory stick. This can be used to restore or reinstall the operating program on the controller. This should be kept in a safe place as replacements are not free and will cause delays if a replacement is required to be purchased, delivered and installed. The program is unique to Marsh, is not to be distributed and will not operate on any controller other than the one provided by Marsh.

The control panel has 3 buttons and is self explanatory so we don't provide an in depth guide for it's use. There are better options for monitoring the processes that follow.

Monitoring the Processes

The display on the control panel shows the active process, the time left to run for the process and the air pressure if the compressor is running.

The panel also has a built in web server that can be browsed on a mobile phone, laptop, tablet or similar.

On your device, browse for Wireless Networks while you are within wireless range of the controller. Connect to WWTP_Controller from the network list. Then go to the browser on your device and put in an address of 192.168.117.1 (http:// 192.168.117.1). If prompted for a password use 12345678.

This will display a login page.

Login as USER, no password required. From here, the SBR controller will sync the controller time to your browsing device and you will have access to:

Home	Status Screen	Plant Status, Last Alarm, Outputs (last recorded pressures), Digital Inputs, Pressure limits Min, Pressure Limits Max, Calibration, Plant Info
	Operating Hours	Operating Hours, Counters, Control Commands
	Periodic Op. Hours	Periodic Op. Hours
	Event Log	Events (power fail, low pressure, unit start, overfill alarm,), Control Commands (export to csv)
	Network Settings	Access point Settings, Station Settings, Global WIFI controls, Cellular Network Settings
	Settings	Language, Set Clock, Buzzer Settings Also includes device “restart”

SBR Controller Configuration and Monitoring

The SBR controller supports various options for configuration and monitoring.

Basic configuration is available through the panel and 3 buttons on the front of the controller. More advanced options are available and detailed in the table below.

Basic Configuration	Using the 3 Buttons on the controller		
WIFI Configuration	Browse to the controller on a phone or tablet		
Remote monitoring and configuration	Controller connects to a Hotspot (mobile phone sharing)	Controller can be defined in a portal and remotely monitored and controlled.	
	Controller connects to home WIFI or Wired Network	Controller can be defined in a portal and remotely monitored and controlled.	
	Controller Connects to GSM network	Controller can be defined in a portal and remotely monitored and controlled.	Requires GSM module installed in the controller and GSM coverage at the installation location.