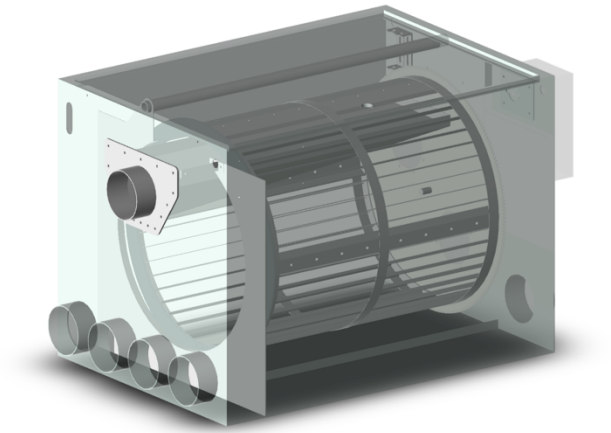
INSTALLATION and USER GUIDE

FREE Drum Filter
for Koi Pond



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1. INTRODUCTION

Congratulations with the purchase of **FREE Drum Filter** and thank you for choosing and using our product.

Please read the instructions in this document before installation and use, if you have any questions please contact the supplier or manufacturer for help.

Rotary Drum Filter (RDF) is an automated filtration machine of a Koi pond. It is a mechanical filtration that automatically remove the dirt and Koi fish waste out of the water column quickly and regularly through a standard 70 micrometer fine mesh with automated washing cycles.

With **FREE Drum Filter** help, you no longer need to perform painstaking tasks such as cleaning filter media pads or cleaning settling chamber, backwashing mechanical filters or changing the water periodically. **FREE Drum Filter** will take care all of those tasks automatically. It quickly remove waste from water column that help reduce toxins from the pond and help your fish grow optimally and maintain your pond water crystal clear.

The **FREE Drum Filter** was designed with the below key factors in mind that make it an excellent filtration system that handles all of the complex functionality to be a great filter for any koi ponds, but still simple enough to be most reliable and effective drum filter system:

- Stainless steel construction that can withstand the harsh conditions that are found in any koi pond environment.
- Robust and simple electronic components to mitigate failures and make troubleshooting an ease. No complex and delicate electronic modules that are prone to failure in the tough koi pond environment.
- Designed by engineers that are also pond-enthusiasts to assure the highest level of functionality as well as simplicity of use and maintenance for the pond hobbyist with little to no engineering background.
- The **FREE Drum Filter** is designed to assure maximum surface area of the mesh to assure maximum effectiveness and flow rate.

FREE Drum Filter and included accessories in the package:

- The Drum Filter
- Control Box
- High pressure sprayer pump and check valve for sprayer pump
- Automatic water supply valve *(from model FREE35 and above))*
- Electrical cords, signal cables and fittings
- Documentation of Installation and User Guide
- Warranty card

Parts in optional order (If any):

- Flexible hose and Stainless-Steel Hose Clamps
- Operarion Monitoring on Smartphone Box - IoT Box
- Auxiliary power for high power circulation pump - Pump Power Box
- Auxiliary spray noozle for hi-debris pond
- Pump-Fed Accessories kit

Product warranty and technical support:

All products provided by **FREE Drum Filter** are guaranteed free of charge for **02 years** from the date of purchase due to design errors, manufacturing faults due to quality of materials or workmanship.

All **FREE Drum Filter** products are supported, guided and answered by the manufacturer throughout the life of the product.

Modifications to any components of the **FREE Drum Filter** or its sensors void your warranty. Any replacement parts that are not from out manufacture approved spare parts will also void your warranty.

Notice upon receiving of goods:

Shipping may cause minor shifting of parts. Ensure that the filter mesh is not damage and 2 float sensors are still secured within soft pads protection. Notify our representatives immediately of any damages or defects upon receipt of the filter.

Check out all of the included accessories as mentioned above.

Details of the FREE Drum Filter components:

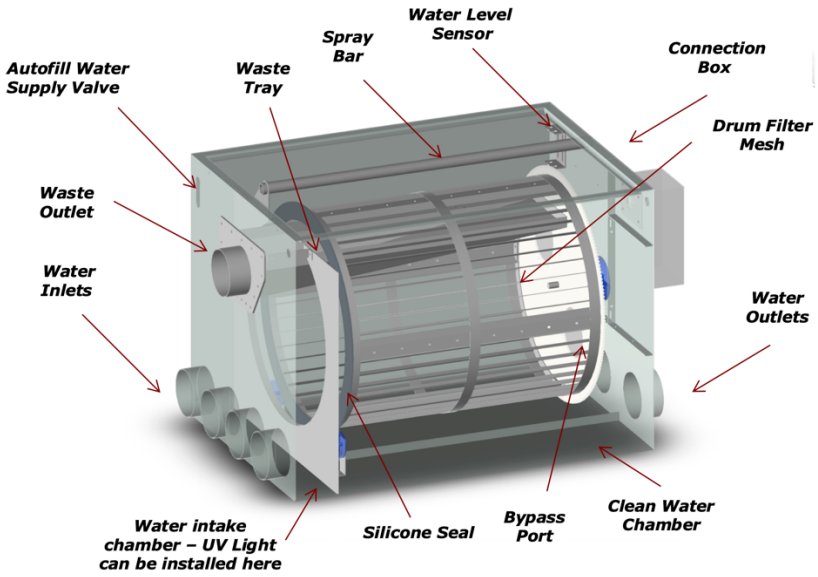


Figure 1

2. GENERAL GUIDELINE FOR GRAVITY-FED INSTALLATION

2.1. SITE PREPARATION:

The drum filter must be placed in a dry location and on a solid surface that is completely level.

Water inlets, outlets and waste outlet should be plumbed and ready to be connected to your particular filter (dimensions and plumbing specifications can be found at the website ***www.freedrumfilter.com***). You can connect Bottom Drains, Skimmers, and Mid-Water intakes to the inlet-connections. The outlet connections can be connected directly to the Pump(s) or to a Bio-filter chamber such as a Moving-bed, then to the pump(s).

In case of a water buildup and backup, it is recommended that the filter pit should have a sump pump installed to avoid accidental damage to the filter.

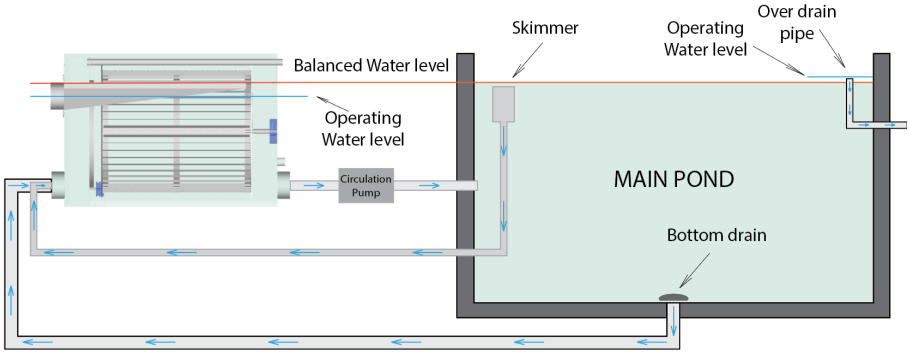
A electrical outlet should be installed above any potential water height by a professional and licensed electrician for use with the filter.

Recommended: An air pump (not included) should be running to maintain oxygen levels in the main pond at all times to prevent harmful situations if unexpected filter failure occurs.

2.2. INSTALLATION:

2.2.1. Determine the height of the drum filter:

Figure 2



Maintaining correct water level is crucial to ensuring proper and effective filter functionality and maximize the surface area of the mesh. Make sure that the placement of the filter allows you to adjust the height of the filter.

With the circulating pump is not running. Set the drum filter height so that the water level is equal to the top of the waste tray (the red line as shown below).

Another quick and simple way to determine the height of the drum filter by placing the filter so that the filter cover is approximately 4 inch above the desired level of the main pond water when circulating pump is not running.

Note that setting the drum lower than the recommended height can cause a loss of water when turning off the circulating pump or in the event of a power outage. Setting the drum higher than the recommended level will reduce the submersed area of the mesh which reduce the flow of the drum filter resulting in drum inefficient operation.

2.2.2. Connecting Water Inlets/Outlets:

Connect Bottom Drains, Skimmers, and Mid-Water intakes directly to the inlet-connections.

Connect the outlet-connections directly to the Pump(s) or to a Bio-filter chamber such as a Moving-bed, then to the pump(s).

It's recommended to use flexible couplings with hose clamp such as Rubber Fernco Couplings for these connections.

Try to connect all available inlets to ensure enough water intakes and to take full advantage of the filter capacity.

2.2.3. Connecting Waste Outlet:

Waste outlet can be connected directly to the drain or to a container for collecting waste before draining out.

Try to keep the waste pipe straight, avoid using reducers or having many elbows/turns which may restrict the discharge of the waste.

2.2.4. Installation of the spray pump:

Connect water supply outlet for spray pump from the clean water compartment of the Drum filter *(See Figure 2)* to the supplied Check valve, then to the inlet of the spray pump.

The check valve allows you to install the spray pump at any location. Please note that if it is installed at a position higher than the water level in the Drum filter, you will need to prime the spray pump before turning it on (For the first time only), after that, the check valve will keep your pump primed.

The spray pump outlet will connect to the spray bar *(See Figure 1)*.

Connect the spray pump to the spray pump power wire on the Connection Box (see Electrical connection section below).

2.2.5. Autofill water supply installation:

Maintaining a correct water level is crucial to ensuring proper and effective filter functionality. The water supply Autofill Valve will compensate the water loss due to the washing process, pond water evaporation, which helps maintain the proper water level.

Autofill valve is optional. You may choose not to use it, but you must have other ways to maintain the good water level.

It is important that the water supply must be treated to eliminate harmful chemicals before water's going to the Autofill valve. Failure to do so may endanger your Koi fish in the event of excess water discharged into your pond.

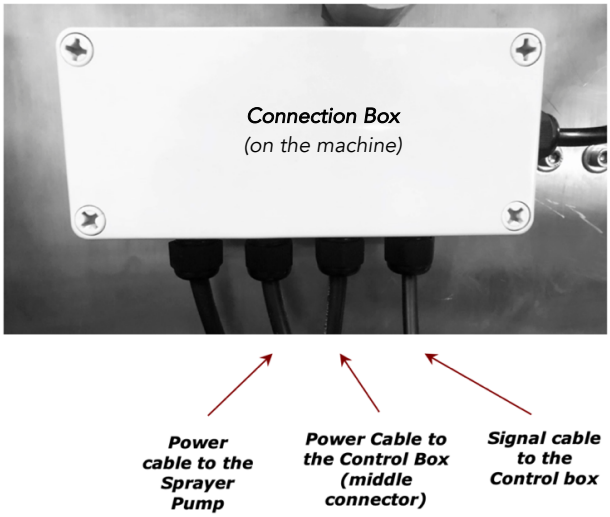
2.2.6. UV Lamp Installation:

UV lamp (optional) can be placed in the water intake or water outtake compartments.

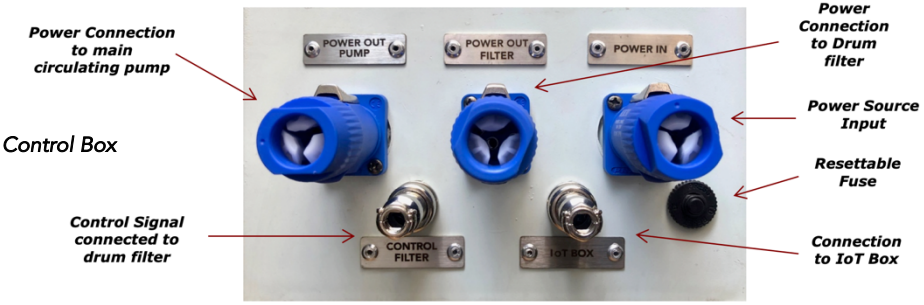
2.3. ELECTRICAL CONNECTION:

The Control Box ***placed in a dry place, avoiding direct sunlight and rain***. All connections are shown in the below picture.

Caution: *Power socket for circulation pump on Control box with maximum current load:* ***5 Amps*** *(with models under FREE35);* ***7 Amps*** *(with models from FREE35 to FREE100);* ***10 Amps*** *(with models above FREE100). If using higher pump power, please order* ***Auuxiliary Pump Power Box****.*



Notes: Connection Box (on the machine) and Control Box are wired, plugged and labeled available. Not necessary to open the Box for connection.



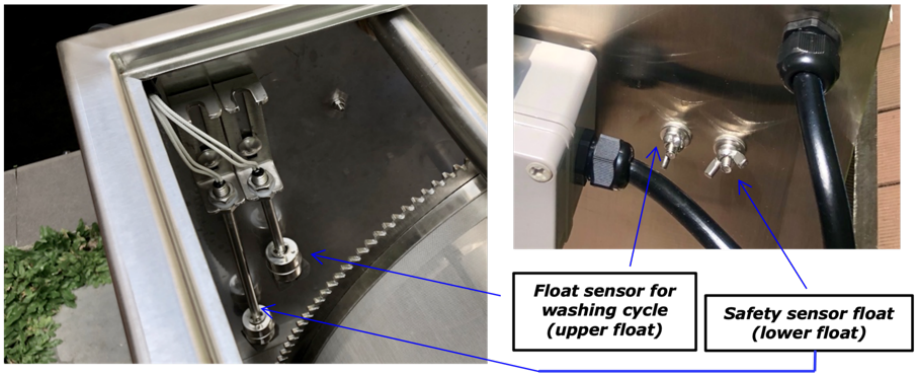
2.4. PREPARATION FOR THE FIRST TEST RUN:

After all pipe connections and electrical connections are complete, perform the steps in the following checklist to prepare for the first operation test run of the Drum filter:

- Making sure all system pumps are turned off.
- Prime the sprayer pump if it is installed higher than the water level.
- Make sure the foam protecting the float during shipping is removed.
- Check the water level in the drum to ensure it is at the recommended level and the two sensor floats are submersed at the desired depth level (See Aligning the Sensor Floats section below).
- Turn on the Power button (green) on the Control Box and turn the rotary switch to Automatic mode.
- Press the Rinse Push button (yellow) on the Control Box to test the drum spinning and washing action.
- After testing the drum rotation and washing operations, turn on the circulating pumps and watch the Drum filter operation. The cleaning cycle should automatically start within the next 10-30 minutes depending on how dirty the water is and how deep the water sensor float is set.
- When you first turn on the system, it is normal that the washing cycle will be running more often, sometimes every few minutes, because water is still dirty. The water clarity will gradually improve and once it's stabilized, the cleaning cycle should only run every 15-30 minutes. Once it's stable, perform further adjustment for the sensor float if needed (See Aligning the Sensor Floats section below).

Note that during the first run, some time the spray nozzles may be clogged by glue or debris entered the system during the pipe installation. If this happens, remove the nozzles with the 14 mm or 9/16 inch wrench to clean the nozzles.

2.5. ALIGNING THE SENSOR FLOAT:



2.5.1. Aligning the Washing Cycle Float Sensor (Upper Float):

When the water is dirty and clogging the drum mesh, the water level around the automatic spray sensor float goes down. Once the water level is lower than the float sensor, it will trigger the sprayer pump to wash the mesh.

After spraying, the water level rises which brings the sensor float up and wait for the next cycle to be repeated. Therefore, the deeper the sensor float, the longer the interval between the spray cycles and vice versa. We recommend adjust the sensor float so that the cleaning interval is between 15 minutes to 30 minutes.

After turning the system pumps on the first time, wait until the water becomes clear and cleaning cycles stabilized, observe the water level at the sensor float and adjust the float so that the float is submerged about 2 to 4 cm below the water level when the drum has just been sprayed. That should give you the cleaning interval of around 15-30 minutes. Move the sensor float down if you want to have a longer interval and move it up if you want to have a shorter interval.

In case the water level is lower than the spray sensor float for some reason such as water intake being blocked, or the pond is losing water that brings the water down too low... the controller automatically switches to MANUAL mode, which will run as a preset time interval. This preset interval and be adjusted. (See Preset washing time interval in MANUAL mode below).

Caution: Switch the drum into STOP Mode before aligning sensors for safety reasons.

2.5.2. Aligning the Safety Float Sensor (Lower Float):

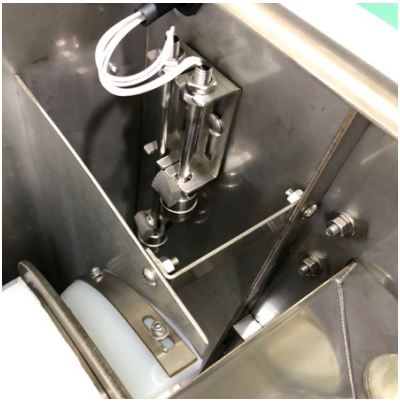
In case there is an issue with the system that brings the water level to a dangerous low level which is lower than the safety float sensor, the Control Box will alarm with a continuous warning sound and stop all drum activities including the circulation pump (if this pump is plugged into the power source from the Control Box).

Adjust this safety float to a desired level if you wish to.

3. GENERAL GUIDELINE FOR PUMP-FED INSTALLATION

FREE Drum Filter can be fully compatible with Pump-Fed type installation which system pumps would pump pond water directly into the inlets of drum. This type of installation allows drum filter to be put above the main pond water level and the water output will be flowing to the pond by gravity. In this installation type, Control Box is still set to AUTO mode as normal, however, we will need to change in the installation as follows:

- Move the 2 float sensors from the clean water side of the drum filter to the dirty water side (intake chamber) in opposite and symmetric position (see picture below).
- The floats on the 2 sensors will need to be flipped (take out float away the rod sensor, reverse the end of float and put back).
- In the connector box, swap the wires positions of both sensors so that the wires from the long float sensor will be connected to the slots that used to be for the short float sensor and vice versa. Basically, the former "spray sensor" (short float sensor) will now function as the safety sensor and the former "safety sensor" (long float sensor) will now function as the spray sensor. (See picture below)
- The Outlets must be attached to Z-shaped pipes (see picture below) so that when water



flowing out by gravity, there will always be a minimum amount of water remained inside the drum which should be at least 1 inch higher than the center of the rotary drum to keep the drum filter operate effectively and avoid damage to the drum filter.

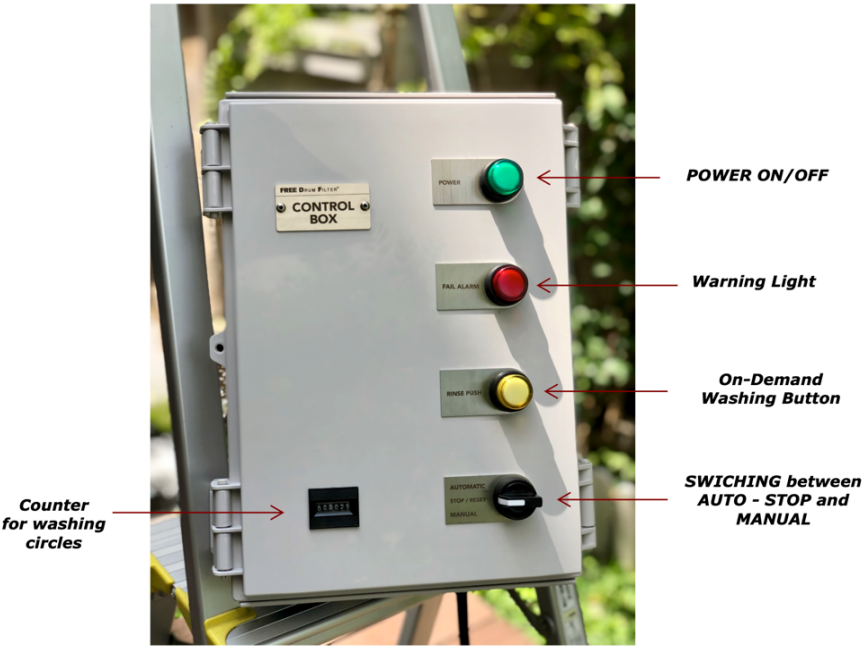
Note: The Z-shaped pipes are not supplied. They can be made by connecting two PVC elbow fittings together.

- With circulating pump(s) running, adjust the lower float sensor (long float sensor) so that the float is about 1-2 inches above the water surface. When the water gets dirty that clog the mesh, the input water raising will lift the float sensor which would start the cleaning cycle.
- Adjust the safety float sensor (warning sensor) so that the top of the float is about 1-2 inches lower than the top of the waste tray. That will prevent excessive water spilling into the waste tray which would result in water loss.

Note: User need to receive a Pump-Fed Accessories Kit free of charge from Dealer including extend wires, terminal connection… and User Guide for this setup.

4. HOW TO USE THE DRUM FILTER

4.1. *FUNCTIONS ON CONTROL BOX:*



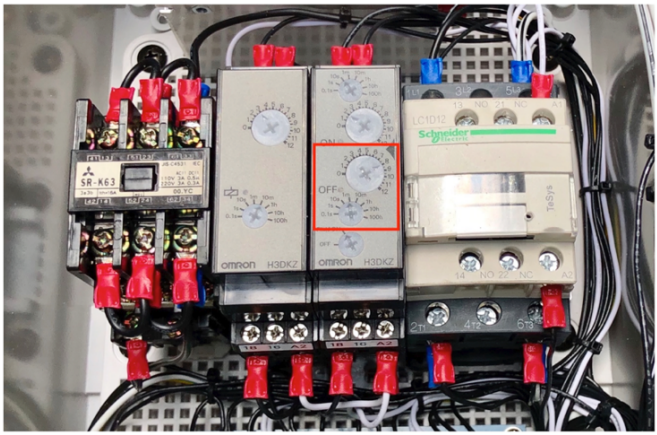
4.2. *PRESET WASHING TIME INTERVAL IN MANUAL MODE:*

In MANUAL mode, the default setting ***10-15 minutes***. This can be changed but adjusting the two dials in the "red" box as shown below.

For Example:

If you want to adjust the cycle to ***20 minutes*** interval, set the big dial ring to ***number 2***, and the small dial ring to ***10m***.

If you want to adjust the cycle to ***12 minutes*** interval, set the big dial ring to ***number 12***, and the small dial ring to ***1m***.



4.3. NOTICES IN USE:

4.3.1. Maintenance:

Drum Filter should be checked periodically for any large debris in the waste tray such as leaves, algae (if any) that may obstruct the drainage especially during string algae blooms or during Falls season (leaves).

Observe the cleaning cycles to make sure that it's cleaning at the normal interval. When you see that the cleaning cycles happen more often than usual, you should check the water level and the drum mesh condition. There are two reasons that normally cause the washing happen more often:

- The amount of water input is lower than normal. This could happen when the pipes are clogged with algae, leaves, etc. or when the water level in the pond is lower than the recommended level.
- The drum mesh is so dirty or the biofilm is formed on the mesh that it needs to be clean.

4.3.2. Cleaning of the drum filter mesh:

Drum mesh should be inspected periodically and should be cleaned every 6 months to 1 year depending on the condition, with a solution of dilute Muriatic Acid 30-35%.

Caution: Muriatic Acid is a dangerous chemical that could cause severe burns to skin, eye, nasal and respiratory system… even with a short term inhalation or exposure to muriatic acid. Strictly follow the safety instructions from the manufacturer and make sure to wear a mask, gloves and glasses when handling the solution.

- Change the drum to STOP mode.
- Use a paint brush to brush the solution on the mesh to clean the biofilm.
- Press and hold the RINSE PUSH button (yellow) to spin the drum to the area that has not been cleaned. Repeat until finish the whole drum.

Caution: Do not use high pressure washer to clean the mesh, it may caused damages on screen.

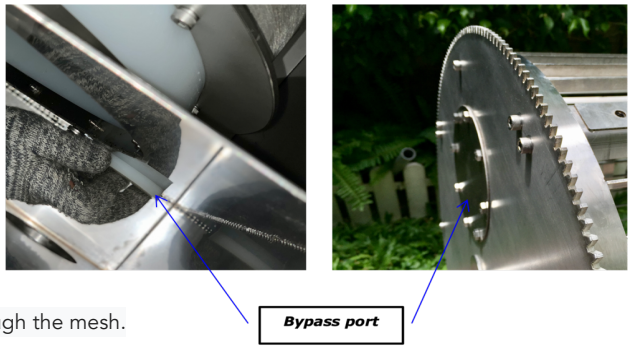
4.3.3. What to do in the event of the alarm sounds:

- Turn off the POWER button (green) to stop the alarm.
- Turn off other circulation pumps (if any).
- Check the water level in the main pond to make sure it is at the recommended level.
- Check for any obstruction in the waste tray and from the inlet pipes. Also check skimmers and bottom drains for any large debris that may obstruct the flow.
- Check the drum mesh for biofilm forming on the mesh.
- After everything is clear and the water level is at the correct level, turn on the POWER button (green) and press and hold both FAIL ALARM button (red) and RINSE PUSH button (yellow) at the same time for about 15 seconds. Observe to make sure if the drum spins and rinses normally then you can restart the system. If the drum does not spin or does not spray, please contact the supplier / manufacturer for technical support.

It's important that if you have to stop the circulation pumps. You should make sure to run air pumps to provide plenty of oxygen in the pond.

4.3.4. *Using bypass ports:*

In the event that you have to stop the filter operation when the device is waiting for repair, you should open the two covers located on the back of the drum or below the partition wall between the chambers (depending on models). This will allow water to flow directly without going through the mesh.

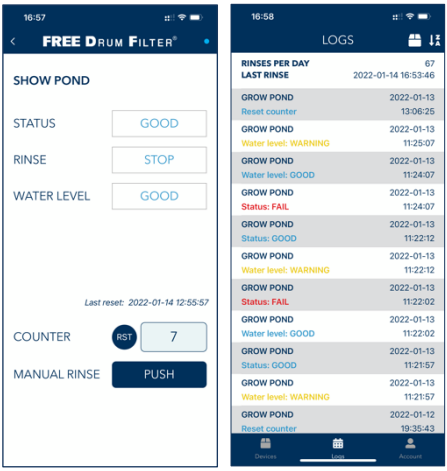


4.4. *OVERVIEW FEATURES OF THE IoT BOX:*

The **IoT Box** is the smart device using our proprietary cloud-base App developed by **FREE Drum Filter**, can be downloaded from the **Apple Store** or the **Google Play Store**, allows users to monitor, control the RDFs and receive notification on their smartphone (**iOS** or **Android**). Below are the list of features/Indicators:

- Indicatior and Push notification for Power outage or Connection status.
- Indicatior and Push notification for Operation status or failure alert.
- Indicatior and Push notification for Water level status or water level should be inspected.
- Indicates rinses status.
- Counting the total number of rinses and resetable.
- Push button to start a cleaning cycle.
- Indicates total number of rinses within the last 24 hours and push notification when excessive cleaning.
- Log panel recording important events with real time.
- Monitor and control multiple RDFs using the same App.

Detailed installation instructions of the IoT box will be included with box when you order product.



(*) Disclaimer:

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