

# Clack WS1 Birm Installation & Start-Up Guide

Thank you for purchasing a Clean Water System! With proper installation and a little routine maintenance your system will be providing treated water for many years.

Your new system comes with a printed Clack Service manual, which along with this start-up guide will help guide you in the installation and start-up of your new system. The Clack service manual covers other types of systems as well such as water softeners and filters, so there may be information in your Clack service manual that does not pertain to your system. Please review this start-up guide entirely before beginning to install your system and follow the steps outlined for best results.

BIRM MEDIA CONTAINS DUST.

USE PAPER MASK AND VENTILATE TO AVOID BREATHING DUST.



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## Pre-Installation

1. Review your packing list and make sure you have received all the parts before beginning installation.
2. If you are going to be turning off the water to the house and you have an electric water heater, shut off the power to the water heater before beginning installation in case water heater is accidentally drained.
3. Pick a suitable location for your filter system on a dry level spot where it won't be exposed to freezing temperatures. A minimum of 20 PSI is required. Maximum pressure is 90 PSI.
4. Get all of your plumbing parts together before beginning installation. Installation typically takes 3 to 5 hours. However after installation the Birm Birm Filter must be allowed to run through a complete backwash and rinse cycle.
5. After the system is installed and running, your water may be discolored, or full of sediment or rust, particularly if this is older or corroded piping. Typically this clears up over a day or two.

## Best Practices for Piping & Drain Installation

1. See typical installation (see Fig 2). The Birm filter is installed after the pressure tank.
2. Make sure to follow to connect the in pipe to the Clack WS1 inlet and the outlet to the outlet (see Fig 2). As you face the Clack WS1 control from the front, the water enters on the right and exits on the left. From the back (see Fig 2) the water enters on the left. The inlet and outlet are attached to the bypass valve which is marked with arrows as well.
3. Make sure there is a working gate or ball valve before the Clack WS1 Birm filter and also one after as shown in the diagram Fig 2. The pressure gauges are optional and perhaps not necessary but a hose bib (which is a faucet that you can attach a garden hose to) is strongly recommended after the Birm filter before the second ball valve. This makes it easy to rinse your new Birm filter on start-up and gives you a place to test the water before it enters your household plumbing.
4. If you will be using copper piping, do not sweat the copper pipe directly on to the Clack WS1 control valve. Avoid heating up the Clack WS1 control valve plastic with the torch.
5. You do not need unions to install your Clack WS1 control. If you need to remove it, the Clack WS1 has quick-release couplings that make it easy to put the Birm Birm filter on by-pass and remove the filter system from the piping.

- The drain line tubing (not supplied) is connected to a drain from the drain outlet using flexible ½" ID tubing. Note that the drain can run up above the Clack WS1 control and into a drain, it does not have to drain down, as the filter backwashes under line pressure from your well pump. Most plumbing codes require an air-gap connection, so that if your sewer or septic tank backs up, it cannot cross connect with the drain tubing.

## How Your Birm Works

See Fig 1. In your Birm the water enters the top of the tank (red arrows) and flows down through the media and up the distributor tube (blue arrows). The downflow type Birm removes sediment and can be backwashed, which cleans and re-classifies the Birm, preventing channeling. During backwash, the water flow is reversed and water flows down the distributor tube and up through the media, lifting and expanding the Birm media. During the backwash the Birm is cleaned by the action of the water flowing through it.

Figure 1 Birm media in tank

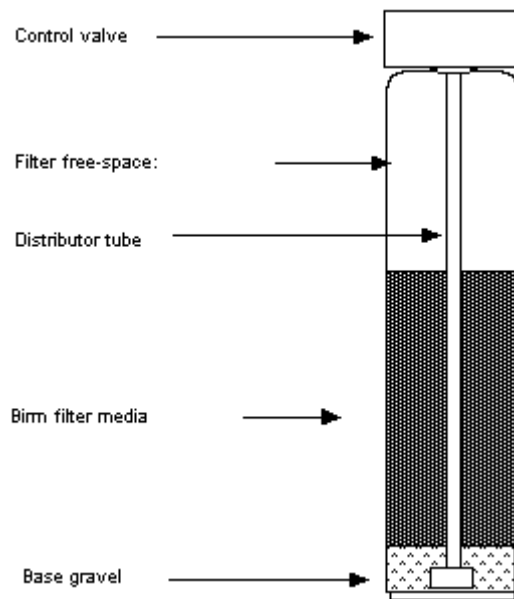
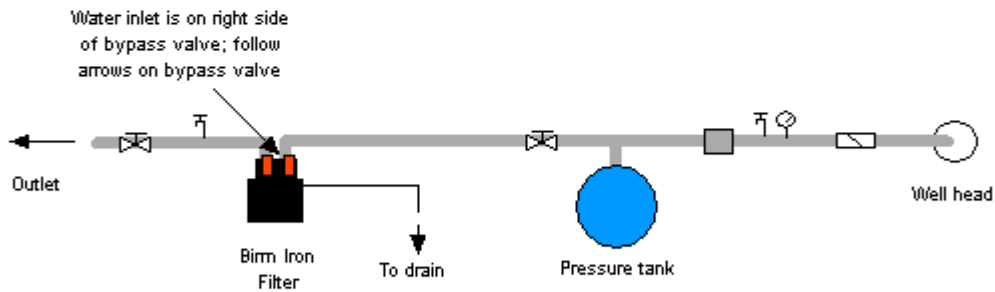
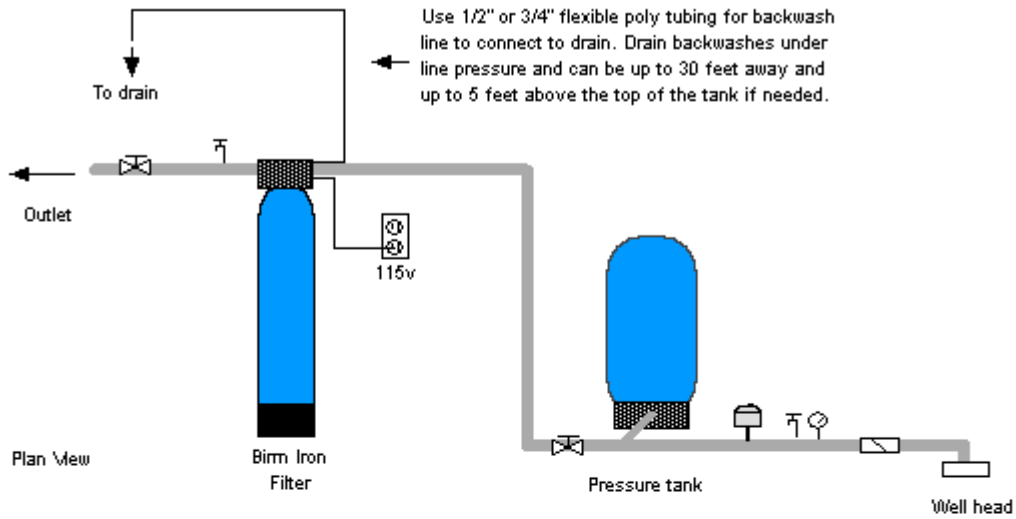








Fig 2 - Birm Birm Filter Tank Water Flow – Install Birm filter after the pressure tank

Auto Backwash Birm Filter System  
Flow Diagram Not to scale



- Key
-  Gate or ball valve
  -  Pressure gauge
  -  Hose bib (spigot)
  -  Water piping
  -  Check valve
  -  Pressure switch

## Assembly and Installation Instructions

1. Unscrew by hand the entire Clack WS1 control valve from top of tank if it was shipped screwed on. Place distributor tube in tank if not already inside tank. If not already done, make sure blue cap is on top of distributor tube, or wrap the top of distributor tube with electrical or duct tape. You do not want gravel or Birm media to go down the distributor tube.
2. Add filter gravel supplied first, using the funnel sent with the Birm filter.
3. Next add Birm. Tank should not be more than about 2/3rds or at most 3/4ths full.
4. Remove cap or tape from top of distributor tube. Be careful not to pull up distributor tube when removing cap or tape.
5. If possible at this point, fill tank completely with water. This will allow the Birm media to settle and eliminate the need of "purging" the air out of the tank later.
6. Add a small amount of silicone grease or vegetable cooking oil to the tank threads and screw on Clack WS1 control valve carefully. Do not use pipe-joint compound, Teflon tape, or Vaseline or other petroleum greases to lubricate tank threads.

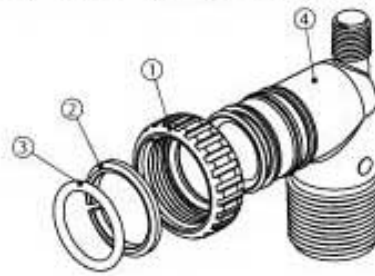
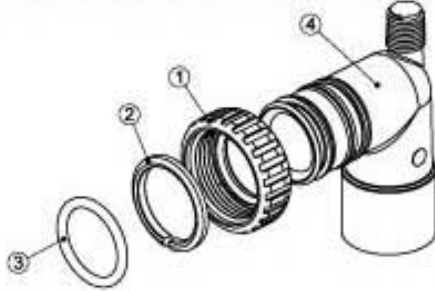
Fig 3 Birm WS1 Control Valve



7. Lubricate the by-pass valve o-rings with some vegetable oil or silicone grease and connect the bypass assembly to the Clack WS1 control by sliding the bypass valve firmly into the body of the Clack WS1. Once bypass is in far enough, you will be able to insert the red connector clips.

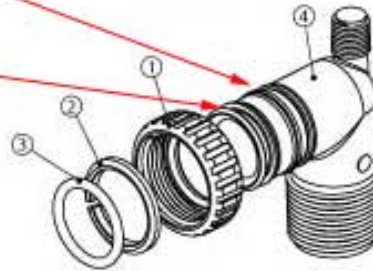
Figure 4 - Installation Fittings

C0710-PVC – 3/4" x 1" PVC Solvent 90° Assembly				C10-PVC – 1" PVC Male NPT Elbow Assembly			
No.	Part No.	Description	Qty.	No.	Part No.	Description	Qty.
1	C3151	Nut 1" Quick Connect	2	1	C3151	Nut 1" Quick Connect	2
2	C3150	Split Ring	2	2	C3150	Split Ring	2
3	C3105	O-Ring 215	2	3	C3105	O-Ring 215	2
4	C3189	Fitting 3/4" x 1" PVC Solvent 90°	2	4	C3149	Fitting 1" PVC Male NPT Elbow	2



**IMPORTANT:** Make sure the split ring is installed between these two ridges on the fitting.

Make sure the o-ring is between the ridges in the front toward the valve.

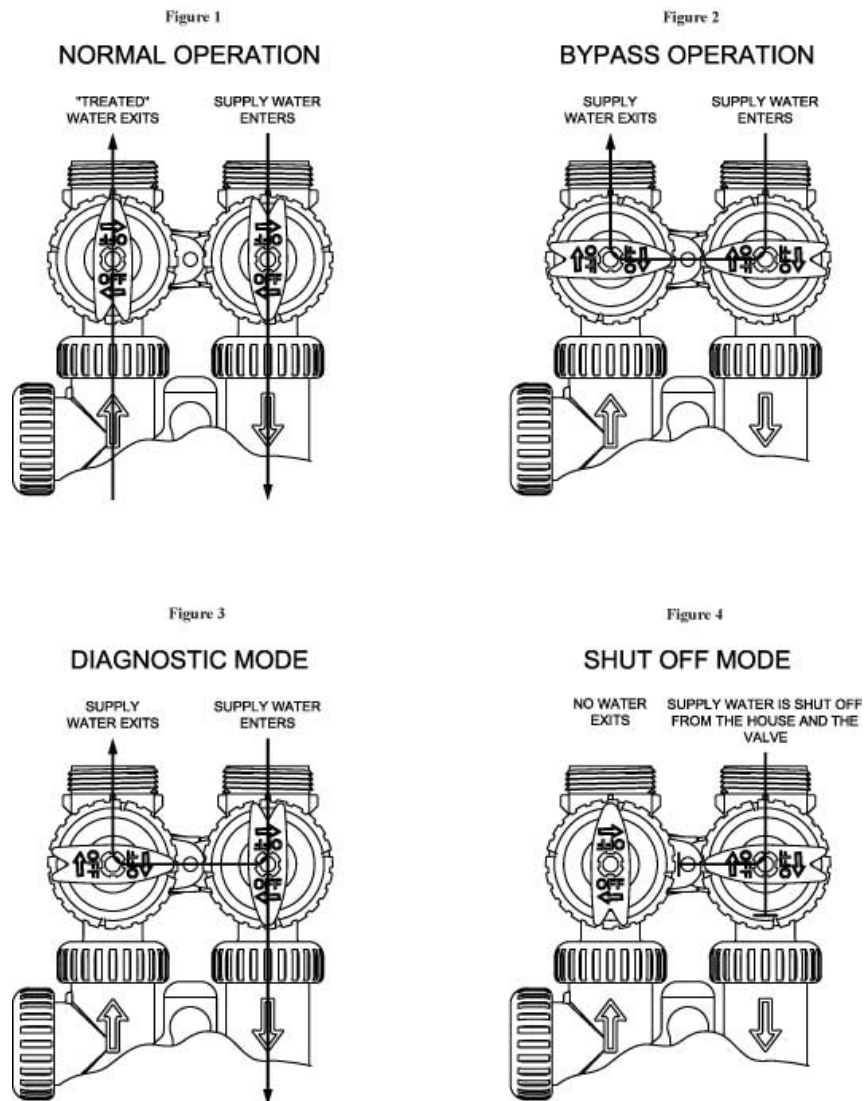


8. See Figure 4. If the O-ring (3) and Split Ring (2) are not inserted correctly, the Nut (1) will not tighten. If the Nut doesn't tighten up and is still loose when you go to connect the installation fitting assembly, then you know the O-ring and Split Ring are not inserted correctly.
9. See by-pass valves (Fig 5). If red valve handles are in-line with pipe they are in service, not bypass. Move both valves to the bypass position if not already in bypass.
10. Now install your water pipes to the Clack WS1 bypass end connectors. (See Fig 3). Make sure inlet is installed to the 'In' pipe connector on the bypass valve and outlet is on the "Out" connector.

- Connect some flexible tubing from the drain connection on the Clack WS1 control valve to a suitable drain such as a septic tank or drain to a sewer. It is OK to run the drain line up and over the Clack WS1 Birm filter up to 4 feet above the top of the tank. If the drain line will be more than 20 feet, use larger diameter tubing such as 3/4" or 1". Note that it is desirable to be able to run the drain line into a bucket in order to test the backwash flow rate in the future. This is why hard piping the drain line is discouraged, however, if you do use hard PVC piping for the drain line, and you are able to remove the hard PVC drain piping and attach flexible tubing should you ever desire for testing purposes, it is OK to use rigid PVC pipe for the drain. Make sure to use Teflon tap or Teflon pipe joint compound on the threads to attached the barbed fitting to the drain fitting on the control valve. The drain tubing is then firmly clamped to the barbed fitting with a hose clamp (not included with shipment) to prevent leaks.

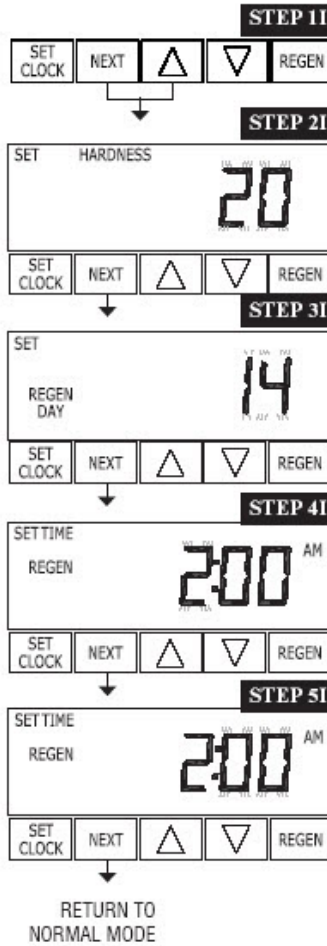
Figure 5

## BYPASS VALVE OPERATION



12. For programming your neutralizer filter, first set it to the real time of day using the up or down arrows. Then follow the steps below and set the filter to backwash every 4 to 7 days (or less if the water has very high iron or sediment). **If you have any difficulty programming it or see different values than what is shown below on this page, see Page 11 “OEM Filter System Setup Quick Reference” to set the control to the correct default settings for your filter.**

#### Installer Display Settings



STEP 11 - Press NEXT and ▲ simultaneously for 3 seconds.

STEP 21 -

Should be displaying "-nA". If not, then press REGEN to exit Installer Display Settings and see the page "OEM Filter System Quick Reference" and make sure it is set to those values on that page. If it is set to "-nA-", press NEXT.

STEP 31 -

Day-Override - This is where you set the number of days in between regeneration (backwash and rinse cycles). It should be displaying a number, typically 14, which you will want to change to 7 (for every 7 days). If it displays "oFF", then using the up or down arrows, adjust to number of days. Press NEXT to go to the next step.

STEP 41 - Next Regeneration Time (hour): Set the hour of day for regeneration using ▼ or ▲ buttons. AM/PM toggles after 12. The default time is 2:00 a.m

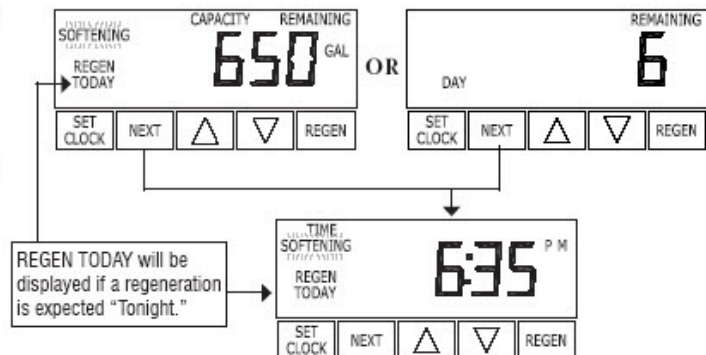
STEP 51 - Next Regeneration Time (minutes): Set the minutes of day for regeneration using ▼ or ▲ buttons.

To initiate a manual regeneration immediately, press and hold the “REGEN” button for three seconds. The system will begin to regenerate immediately. The control valve may be stepped through the various regeneration cycles by pressing the “REGEN” button.

#### User Display Settings

##### General Operation

When the system is operating one of two displays will be shown. Pressing NEXT will alternate between the displays. One of the displays is always the current time of day. The second display is the days remaining before the system goes through a regeneration (backwash and rinse) cycle. If your display is displaying gallons remaining, then it is not set correctly and can easily be changed. See the page "OEM Filter System Setup Quick Reference" and make sure it is set to those values.





13. Now you are ready to turn on the water. Turn on the water and leave the Birm filter on bypass and check for leaks. Leave the ball valve after the Birm filter closed, so water is still off to the house, but connect a garden hose and open up the hose bib after the Birm filter and allow the water to run. This will help to clear out any foreign material that may be in the pipes from the piping installation. If you do not have a valve installed after the Birm filter and you do not have a hose bib, you will need to turn the water on inside the house to let the water run. Use a bathtub or laundry sink or other fixture that does not have aerator screen.
14. Leave the water running out of the garden hose at a slow rate.
15. Press the REGEN button for several seconds which will start a manual backwash.
16. Now you can slowly turn the bypass valve to the service position. First open the Inlet Side of the bypass valve. Second slowly open the Outlet Side of the bypass until it is in the full service position.
17. There should be no Birm media coming out of the drain line, but the water will be gray or dirty looking. At this point the Birm will be in a backwash mode, which is the first of two cycles it goes through during backwash (also called regeneration"). The backwash takes 14 minutes. The next cycle is the rinse which takes 8 minutes.
18. After the backwash and rinse cycles are complete, repeat the process by pressing the REGEN button again for several seconds.
19. Note it is normal for some small amount of Birm dust and fines to come out during the backwash, although you do not want to see a large amount of media coming out, which would mean you have very high water pressure, or the drain flow for the Clack WS1 is missing.
20. If possible verify that the backwash flow is 5 gallons per minute, which is the recommended backwash flow rate for 1.0 and 1.5 cubic foot models. If you have a 2.5 cubic foot Birm it should be backwashing at 10 gallons per minute. You can easily run the drain hose to a bucket and using a watch verify the flow rate in gallons per minute. An adequate backwash is critical to properly clean the Birm media and prevent it from cementing together.
21. Refer to your Clack WS1 service manual for more information about how your control valve is programmed if desired.

## Maintaining Your WS1 Birm Filter System

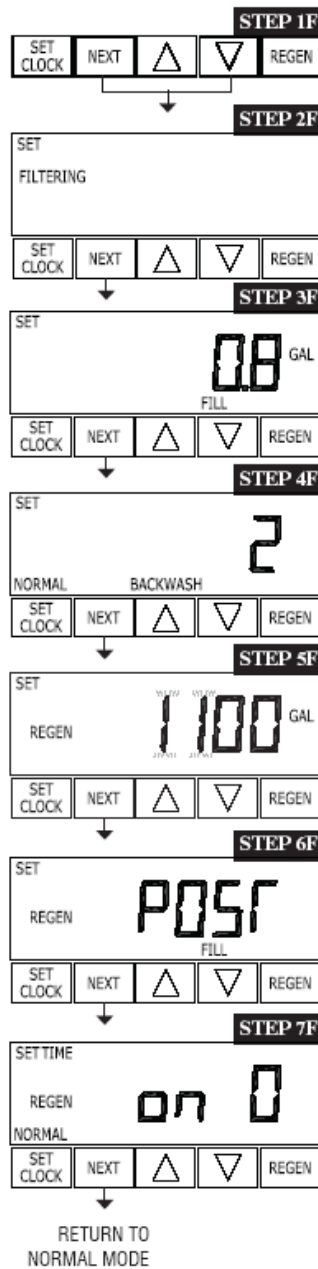
There is little or no maintenance required. Every 4 to 6 years the Birm media can be replaced for best results.

## Troubleshooting the Clack WS1 Birm Filter

One problem that may occur is if you do not have enough backwash flow rate to properly clean the Birm filter. You can verify the backwash flow rate by running the drain line into a bucket and timing it when the Clack WS1 is in Cycle 1 or backwash. A 1.0 or 1.5 cubic foot system should have 5 gallons per minute and a 2.5 cubic foot system should have 10 gallons per minute of backwash.

In some cases, the Clack WS1 may not be programmed correctly. See the Clack WS1 service manual for instructions on how to access the master programming.

## OEM Filter System Setup Quick Reference



**STEP 1F** – Press NEXT and ▼ simultaneously for 3 seconds. If screen in step 2F does not appear in 5 seconds the lock on the valve is activated. To unlock press ▼, NEXT, ▲, and SET CLOCK in sequence, then press NEXT and ▼ simultaneously for 3 seconds.

**STEP 2F** – Choose Filtering using ▼ or ▲ buttons. Press NEXT to go to step 3F. Press REGEN to exit OEM Filter System Setup.

**STEP 3F** – Using up or down arrows, set to "oFF" then press NEXT

**STEP 4F** – Backwash: Select using ▼ or ▲ buttons:  
Make sure it is set to "NORMAL" then press NEXT

**STEP 5F** – Set Gallons Capacity using ▼ or ▲ buttons:  
Make sure it is set to "oFF"; then press NEXT.

**STEP 6F** – Not applicable. Press NEXT

**STEP 7F** – Set Regeneration Time Option using ▼ or ▲ buttons:  
Make sure it is set to "NORMAL" then press NEXT to exit programming.