



Clean Water Made Easy

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CWS Time Clock Birm Filter 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 neutral pH water for many years.

Your new system comes with a printed CWS Service manual, which along with this start-up guide will help guide you in the installation and start-up of your new system. The CWS service manual covers other types of systems as well such as water softeners and filters, so there may be information in your CWS 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.

Questions?

Call us toll-free: 1-888-600-5426 or 1-831-462-8500

Email us: support@cleanwaterstore.com

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Clean Water Made Easy

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Table of Contents

Packing List.....	3
Birm Filter 0.75 cubic foot size.....	Error! Bookmark not defined.
Birm Filter 1.0 cubic foot size.....	3
Birm Filter 1.5 cubic foot size.....	3
Birm Filter 2.0 cubic foot size.....	3
Pre-Installation.....	4
Best Practices for Piping & Drain Installation	4
How Your Birm Filter Works	5
Fig 1 - Birm Filter Tank Water Flow.....	6
Fig 2 - Typical 65 Birm Filter piping installation with ball valve and hose bib after filter	6
Assembly and Installation Instructions.....	7
Fig 3 CWS Time Clock By-Pass and Pipe Connectors.....	10
Troubleshooting the CWS Time Clock Birm Filter.....	12

Packing List

Birm Filter 0.75 cubic foot size

Quantity 1 CWS Time Clock Backwash Control Valve w/ Bypass Assembly & Pipe connector kit (1" or ¾")

Quantity 1 8" x 44" filter tank with distributor tube

Blue media funnel for adding the Birm media

10lbs. Filter gravel

0.75 cubic foot of Birm media

Birm Filter 1.0 cubic foot size

Quantity 1 CWS Time Clock Backwash Control Valve w/ Bypass Assembly & Pipe connector kit (1" or ¾")

Quantity 1 10" x 44" or 9" x 48" filter tank with distributor tube

Blue media funnel for adding the Birm media

12lbs. Filter gravel

1 cubic foot of Birm media

Birm Filter 1.5 cubic foot size

Quantity 1 CWS Time Clock Backwash Control Valve w/ Bypass Assembly & Pipe connector kit (1" or ¾")

Quantity 1 10" x 54" filter tank with distributor tube

Blue media funnel for adding the Birm media

16lbs. Filter gravel

1.5 cubic foot of Birm media

Birm Filter 2.0 cubic foot size

Quantity 1 CWS Time Clock Backwash Control Valve w/ Bypass Assembly & Pipe connector kit (1" or ¾")

Quantity 1 12" x 52" filter tank with distributor tube

Blue media funnel for adding the Birm media

20lbs. Filter gravel

2.0 cubic foot of Birm media

CWS Time Clock Birm Filter Installation & Startup Guide

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 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. This typically clears up over a day or two.

Best Practices for Piping & Drain Installation

1. See typical installation on page 7 (Fig 2). The Birm filter is installed after the pressure tank.
2. Make sure to connect the IN pipe to the CWS Time Clock inlet and the OUT pipe to the outlet (see Fig 2). As you face the CWS Time Clock 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 CWS Time Clock Birm Filter and also one after as shown in 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 and 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.

CWS Time Clock Birm Filter Installation & Startup Guide

4. If you will be using copper piping, do not sweat the copper pipe directly on to the CWS Time Clock control valve. Avoid heating up the CWS Time Clock control valve plastic with the torch.
5. If you have copper pipe before the Birm Filter and it is too difficult to change out, you may still experience some copper staining of fixtures and have a copper residual in the water because this section of pipe will still have acidic water flowing through it. We recommend PEX or PVC pipe up to the Birm Filter and then copper after it, if you have copper plumbing.
6. You do not need unions to install your CWS Time Clock control valve. If you need to remove it, the CWS Time Clock has quick-release couplings that make it easy to put the Birm filter on by-pass and remove the filter system from the piping.
7. 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 CWS Time Clock 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 Filter Works

See Fig 1 below. In your Birm Filter 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 Filter removes sediment and can be backwashed, which cleans and re-classifies the media, preventing channeling. During backwash the flow of water is reversed and water flows down the distributor tube and up through the media, lifting and expanding the media. During the backwash the media is cleaned of any iron by the action of the water flowing through it.

Fig 1 - Birm Filter Tank Water Flow

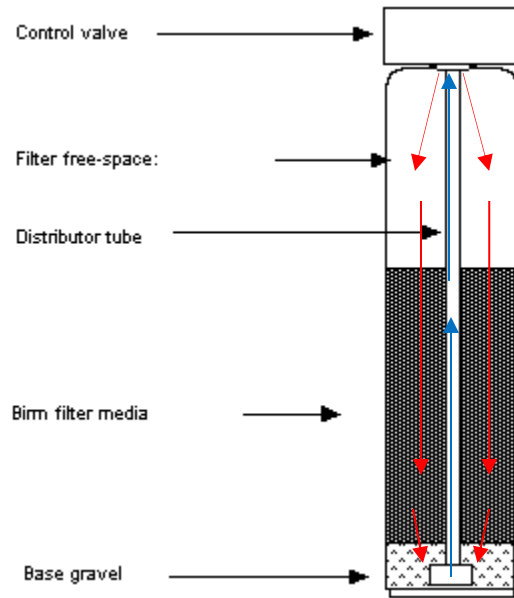
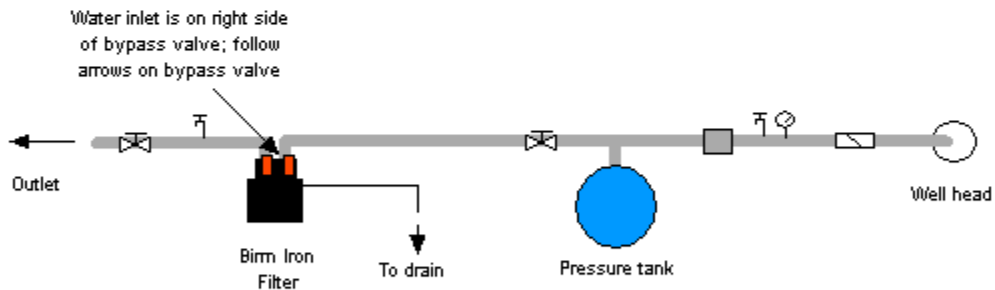
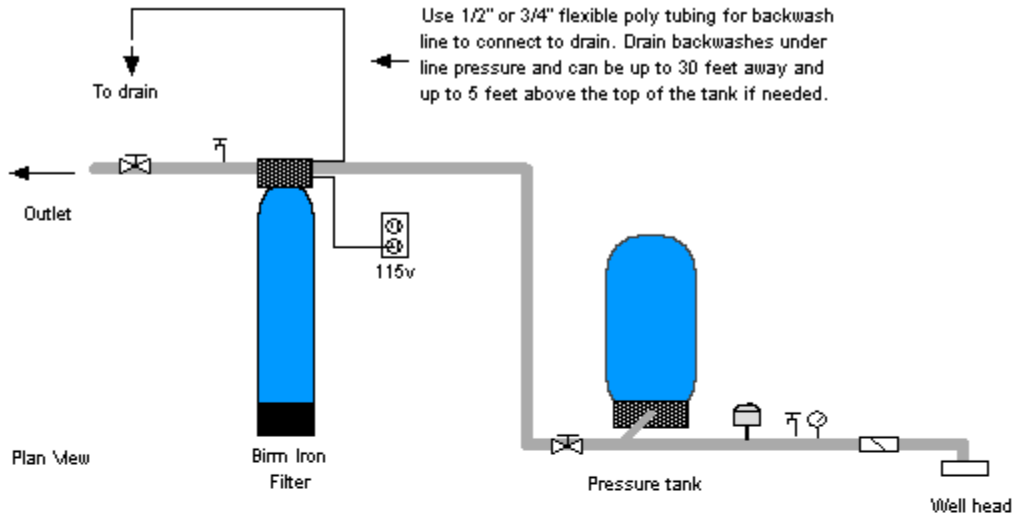


Fig 2 - Typical Birm Filter CWS Time Clock piping installation with ball valve and hose bib after the filter

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

Fig 3: CWS Time Clock from the rear showing the inlet (left) and outlet (right) end-connector fittings 1" or 1-1/4" NPT in Noryl plastic. Brass end-connectors are also available for connecting to copper tubing.

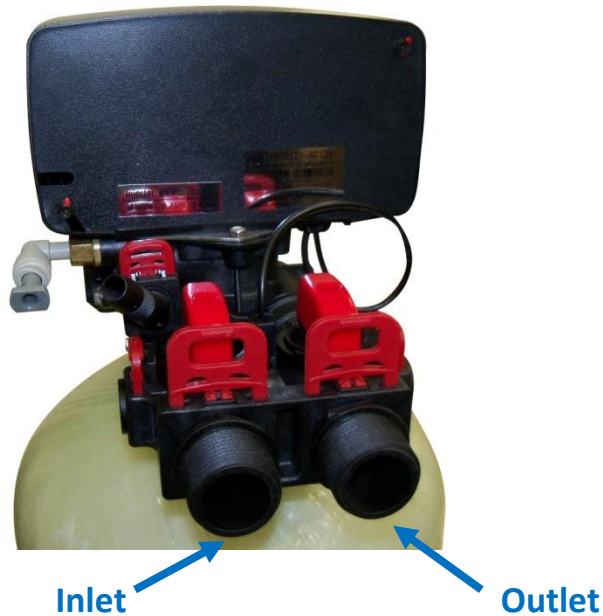
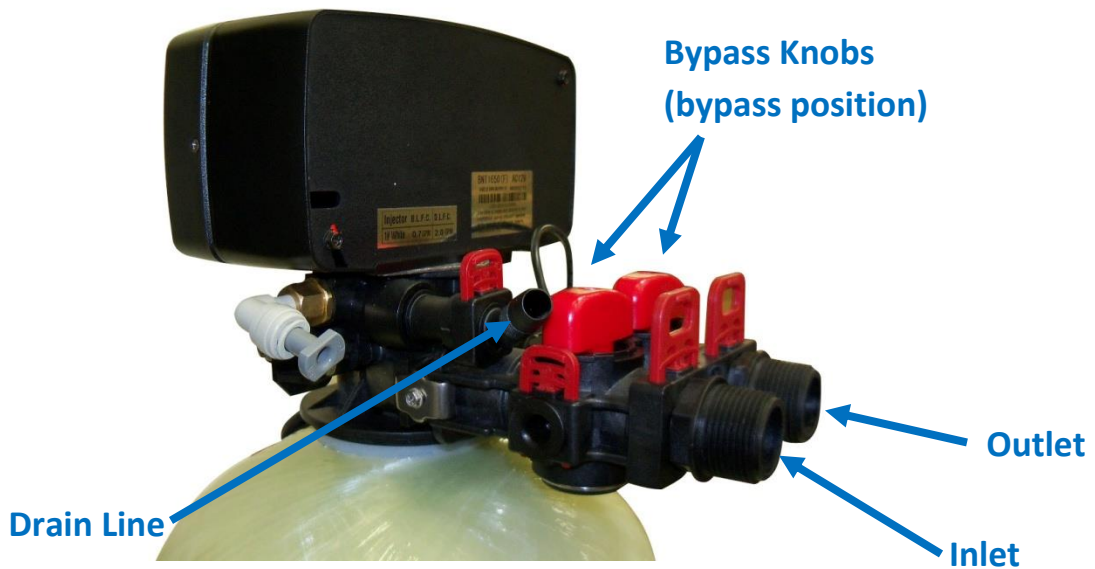


Fig 4 CWS Time Clock side view



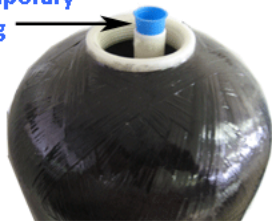
CWS Time Clock Birm Filter Installation & Startup Guide

Assembly and Installation Instructions

1. By hand, unscrew the entire CWS Time Clock control valve from top of tank if it was shipped screwed on. Place distributor tube in tank if not already inside. If not already done, make sure the 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 media to go down the distributor tube.

Plug or tape top of distributor tube to prevent media from entering distributor tube when adding media. Remove when finished.

Temporary plug



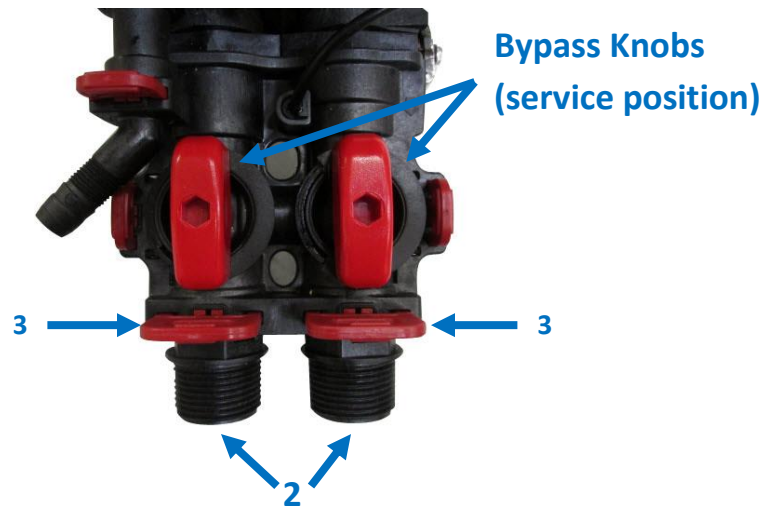
2. Add the filter gravel that came with your order. You want the gravel to cover the bottom distributor screen before adding the media.
3. Next add media. The tank will be about 2/3rds full of media.
4. Remove cap or tape from top of distributor tube. Be careful not to pull up distributor tube when removing cap or tape.
5. If possible at this point, fill tank completely with water. This will allow the Birm Filter media to settle and eliminate the need of "purging" the air out of the tank later.
6. Attach plastic top screen to the under-side of the CWS Time Clock control valve. It is a funnel-shaped plastic screen that snaps on to the control valve and prevents resin from being backwashed out to drain during the regeneration cycles.



CWS Time Clock Birm Filter Installation & Startup Guide

7. Add a small amount of silicone grease or vegetable cooking oil to the tank threads and screw on CWS Time Clock control valve carefully. Do not use pipe-joint compound, Teflon tape, or Vaseline or other petroleum greases to lubricate tank threads.
8. See how the CWS by-pass is connected. Note that Items 2 in Fig 3 below are the pipe connectors and the other end is what gets attached to the control valve. Items 3 are the red clips that hold the pipe connectors to the by-pass valve. **Your CWS Time Clock is usually shipped in the by-pass position, as in Figure 4.**

Fig 5 CWS Time Clock By-Pass and Pipe Connectors

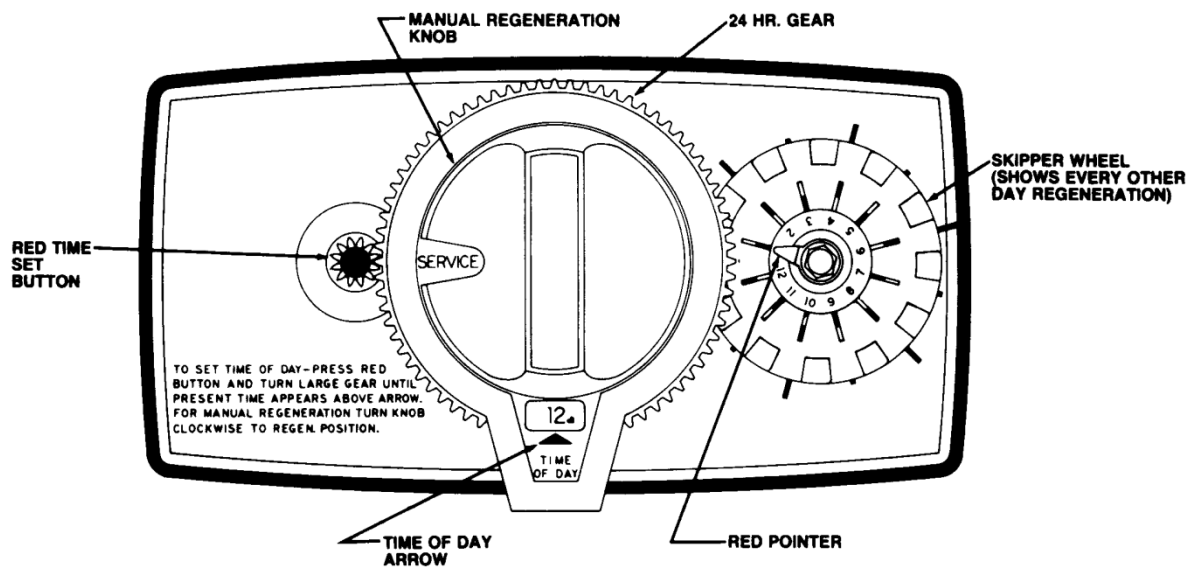


9. Lubricate the by-pass valve o-rings with some vegetable oil or silicone grease and connect the bypass assembly to the CWS Time Clock control by sliding the bypass valve firmly into the body of the CWS Time Clock. Once bypass is in far enough, you will be able to insert the red connector clips.
10. Next lubricate the end-connectors (#2 in Fig 3) with some silicone grease or vegetable cooking oil and insert them into the bypass valve and then insert the red clips (#3).
11. Note that the CWS Time Clock is usually shipped in the bypass position. There is a bypass valve knob on both the inlet and the outlet (Fig 3 #1). You can easily tell if it is in bypass because the two knobs will be in line with each other (Fig 4). If the valve is in the Service position (Fig 5) the knobs will be parallel to each other. Make sure both sides are in the by-pass position.
12. Do NOT remove the red clips in order to put the bypass valve in either bypass or service, it is not necessary nor desired to remove the red clips on the bypass valve hand knobs (see Fig 3 item 1, which are the knobs you will turn to move the bypass valves).
13. Now install your water pipes to the CWS Time Clock bypass end connectors. Make sure inlet is installed to the 'In' pipe connector on the bypass valve and outlet is on the "Out" connector.

CWS Time Clock Birm Filter Installation & Startup Guide

14. Connect some flexible tubing from the drain connection on the CWS Time Clock 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 CWS Time Clock 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 $\frac{3}{4}$ " 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 the drain tubing is firmly clamped to the barbed fitting with a hose clamp to prevent leaks.

Fig 6 CWS Time Clock Diagram



15. Plug your CWS Time Clock control valve into an outlet. Your Birm filter comes preset to backwash at 2:00 am if the timer is set to real time of day.
16. Set timer so it reads the real time of day
17. Slide two pins outward on the skipper wheel (Fig 6) to set the system to backwash once every six days (two pins sticking out).
18. Start a manual backwash by turning the Manual Regeneration knob clockwise to backwash. Very slowly turn the inlet knob on the bypass valve towards the service position, but DO NOT open the valve all the way. We want to allow all of the air in the tank to escape before allowing the water to flow freely. The bypass valve knobs may be a little stiff at first.
19. Once water begins to flow from the drain line open the inlet valve all the way. Continue to let the water run from the drain line for about five minutes or until any media fines in the water are no longer present.

CWS Time Clock Birm Filter Installation & Startup Guide

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 Filter 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 Carbon media and prevent it from cementing together.
21. Allow to go through full cycle automatically. Wait 2 hours and initiate another backwash, or set the skipper wheel so it backwashes the same night as the installation. The filter media should be backwashed twice for best results when the media is new. This eliminates any potential for milky colored water in the household water, and allows the media to be rinsed thoroughly.
22. After backwashing is completed, open up hose bib, bath tub faucet or other faucet such as a laundry sink without an aerator screen in house and allow water to run for 5 to 10 minutes. If piping inside house is corroded, turning on and off the water may dislodge some loose mineral or material. Aerators on faucets may need to be cleaned later if some of the fixtures inside house start to run more slowly.
23. Pull out two pins so it backwashes every six days; the numbers on the skipper wheel represent a 12 day cycle, so sliding pins 1 and 7 out would be every 6 days. If your water has a lot of sediment or iron in it, set to backwash every 3 - 4 days. If your water is very clean, clear water, and there are only 1 or 2 people in the house, you can set it backwash every 12 days.

Troubleshooting the CWS Time Clock 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 CWS Time Clock 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 CWS Time Clock may not be programmed correctly. See the CWS Time Clock service manual for instructions on how to access the master programming.