

Stenner Pump Chlorinator

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 Stenner installation manual, which along with this start-up guide will help guide you in the installation and start-up of your new system. Please review this start-up guide and the Stenner installation manual entirely before beginning to install your system and follow the steps outlined for best results.

CHLORINE BLEACH CAN DAMAGE CLOTHING AND IRRITATE SKIN AND EYES.

USE RUBBER GLOVES AND EYE PROTECTION WHEN HANDLING.

WARNING: Risk of electrical shock. Read Stenner Installation Manual before installing. The pump is supplied with a grounding conductor and grounding type of attached plug. To reduce risk of electrical shock, be certain that it is connected to a properly grounded grounding-type electrical receptacle.

This pump is intended for indoor use. Suitable for outdoor use when installed with a Stenner rainroof.



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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 chlorination system on a dry level spot where it won't be exposed to freezing temperatures. Maximum line pressure is 100 PSI.
4. Get all of your plumbing parts together before beginning installation. Installation typically takes 1 to 5 hours.
5. After the system is installed and running, your water may be discolored, or full of sediment or rust, particularly if you have older or corroded piping.

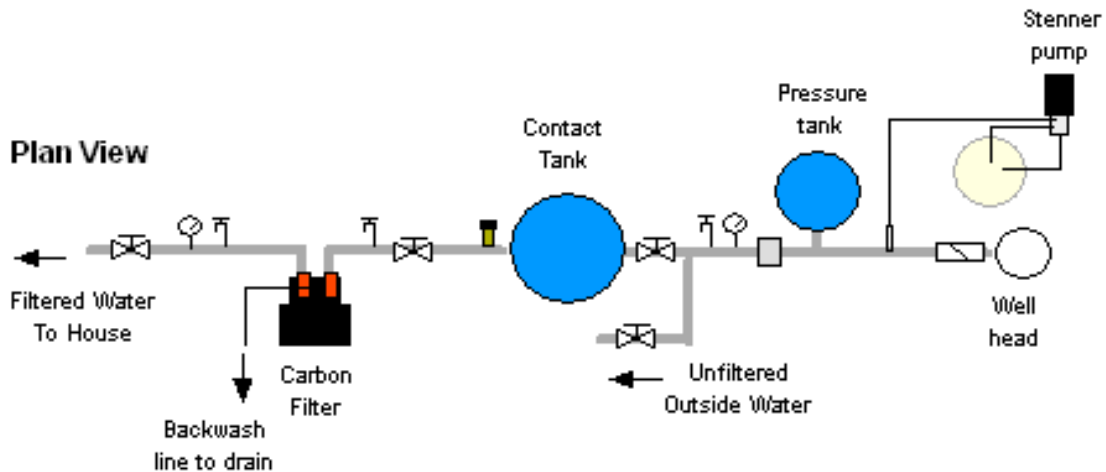
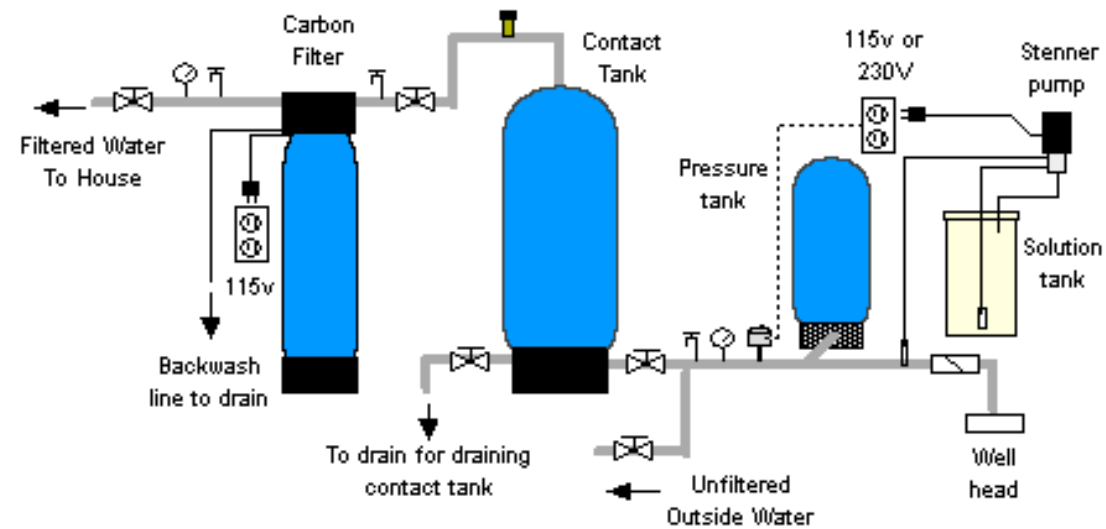
Best Practices for Installation

1. See typical installation for well water. (see Fig 1).
2. Make sure that the Stenner pump turns on and off with the well pump, or if you are using a flow switch, plug into the flow switch so the Stenner pump is activated based on water flow.
3. Do not cut the cord on the Stenner pump for direct wiring to the pressure switch. It is better to install a dedicated wall receptacle that is wired to power on and off with the well pump, unless you are using a flow switch.

How Your Chlorinator Works

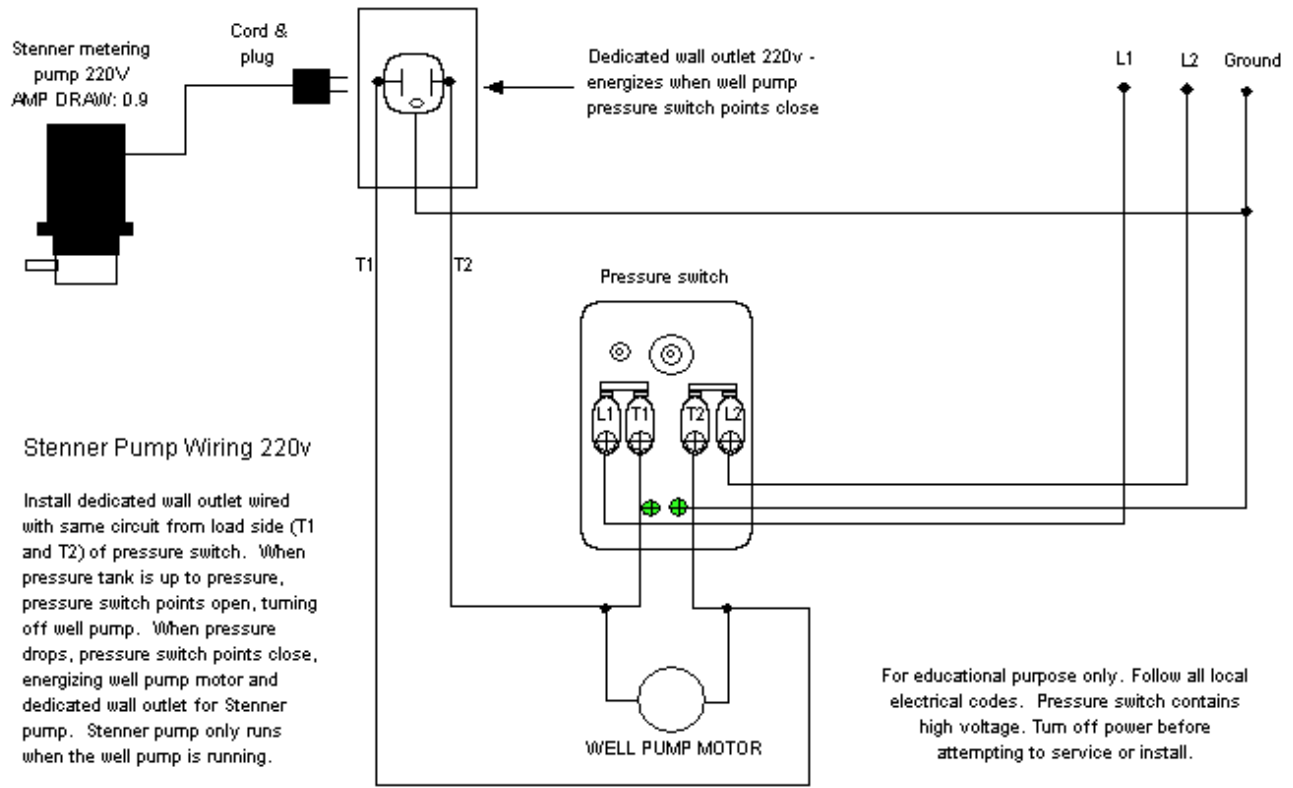
See Fig 2. The well pump is controlled by the pressure switch. A dedicated outlet for the Stenner pump is installed and wired so it is energized when the well pump is energized. When the water pressure in the pressure tank drops below the cut-in point on the pressure switch, the well pump and metering pump turn on. As water is pumped through the system, a small amount of chlorine is pumped into the water by the chlorine metering pump.

Fig 1: Typical installation with contact tank and carbon backwash or iron filter. NOTE – Stenner pump must be wired so it switches on and off with well pump by wiring to same circuit as well pressure switch. Alternatively a Flow Switch can be used. The Stenner pump cannot just be plugged into a wall and left to run for 24 hours a day.



Key	Water piping	Hose bib	Vacuum Breaker
	Check valve	Pressure switch	
	Pressure gauge	Gate or ball valve	

Figure 2: Typical wiring 220v Stenner pump on same circuit as well pump. Run wires from T1 and T2 (load side of pressure switch) to dedicated wall outlet, and plug Stenner pump into outlet so Stenner pump only runs when well pump is energized.



Installation Instructions -

Typically the Stenner pump is wall mounted, facing down. As outlined in the Stenner installation manual, the Optional Spill Recovery is recommended, where you punch out one of the indented holes at the end of pump assembly and insert a length of ¼" tubing (included with pump) so that if the Stenner pump tube fails, the chlorine solution will drain back into the solution tank instead of leaking on to the floor.

As the water flows into the contact tank, the chlorine is thoroughly mixed in the water, allowing contact time to kill any bacteria and oxidize iron, manganese or hydrogen sulfide gas. Precipitated oxidized particles of iron, sulfides and manganese are filtered out of the water by the greensand plus filter system.

Adjust the Stenner pump and the solution strength so there is a free-chlorine residual of 0.2 to 1.0 ppm after the contact tank before filtration.

Regarding optional vacuum breaker: the contact tank can withstand a line pressure of 75 PSI, but cannot take any vacuum. If the contact tank is drained or if the well system loses pressure, and water accidentally drains back down the well, or is drained after contact tank and a hose bib or faucet is not opened to allow air into the tank, a vacuum may occur inside the tank. This will cause contact tank failure, so a small 1/2" or 3/4" vacuum breaker is recommended to prevent this rare occurrence.

Follow all local plumbing and electrical codes.

Follow instructions in the Stenner Classic Series Installation and Maintenance Manual. If you need a copy of the manual you can download it from the Stenner site:

<http://www.stenner.com/support.htm>

THIS IS THE RECOMMENDED INSTALLATION SET UP

NOTE – do not plug Stenner pump into a standard wall outlet. The outlet must be wired so it switches on and off with the well pump, OR a flow switch can be used so the Stenner pump switches on and off based on flow of water.

DISCHARGE SIDE

Shut off water supply.

Connect nut and ferrule to injection fitting or injection check valve. Hand tight only.

To prevent leaks, all the ferrules must be installed as illustrated.

At point of injection, drill a 7/16" hole and tap with a 1/4" NPT pipe tap. Install beyond all pumps, filters or tanks. Installation into pipe "Tee" fittings is not advisable.

The use of a Stenner Calcification Kit is recommended for NaOCl injection.



Note: The use of an Injection Check Valve as shown above is required in all high pressure applications (26 to 100 PSI - 1.73 to 6.9 bar)

Run the lead tube to the solution tank. Allow for some slack in the tube to avoid kinks.

Connecting Nut
 Ferrule
 Clay Weight
 Immerse in Solution Tank

Measure the lead tube on outside of solution tank to ensure it will be 2-3" from the bottom of the tank. Do not allow weight to sit at the bottom of the tank.

Connect nut, ferrule and lead tube to the discharge side of the pumping head (labeled "out" on cover of head). Hand tight only. Do not use teflon tape.

Connect nut, ferrule and lead tube to the suction side of the pumping head (labeled "in" on cover of head). Hand tight only. Do not use teflon tape.

PLUGGING IN

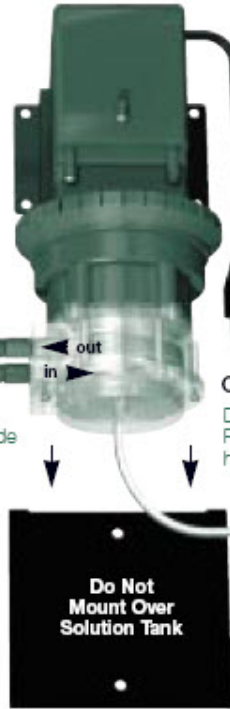
Check current of the outlet vs. voltage requirement of feeder with a voltage meter.

Turn feeder on and set Feed Rate Dial to desired GPD. Refer to the output chart of your specific model number.

Plug into a grounded power source.

OPTIONAL SPILL RECOVERY

Detach tube housing cover. Punch out one of the indented holes with a 7/32" punch.



Insert a length of 1/4" lead tube into the newly created hole and place the other end back into the solution tank.

CORRECT MOUNTING POSITION

Chemicals will drain back into solution tank reducing spillage.

Accessory Kit included with each Stenner pump:

3 connecting nuts 1/4" or 3/8"; 3 ferrules; 1 injection check valve 100 PSI; 1 weighted suction line strainer; 1 20" roll of suction/discharge tubing; 1 spare pump tube; 1 mounting bracket; 1 Stenner manual

How To Select the Chlorine Solution Strength and Pump Setting

The goal of a properly functioning chlorine injection system is to have a free-chlorine residual of 0.2 to 1.0 ppm after sufficient contact time, before any carbon filter system. Or if no carbon filter or other de-chlorination is used, to have a free-chlorine residual of 0.2 to 1.0 ppm at the end of the distribution system or furthest point in the plumbing.

This can be accomplished by adjusting the chlorine bleach solution strength and setting the Stenner Feed Rate Control Dial until you achieve the desired residual.

In determining your metering pumps settings and solution strength, keep in mind that its best to make up fresh solution once every 1 to 3 months. The chlorine solution loses strength as it ages, and is sensitive to heat and light. Generally, keep solution tank out of the sun and use fresh solution regularly for best results.

Step One: Determine flow rate of the water stream you are injecting into, in Gallons Per Minute (GPM)

1. Open any hose bib or faucet until pump turns on.
2. Close hose bib or faucet and let pump fill up pressure tank until it turns off.
3. Using a 1 or 5 gal. bucket, open faucet, collect and measure all water discharged until pump turns on.
4. When pump turns on, immediately close faucet and start timing pump cycle.
5. When pump turns off, record pump cycle time to refill pressure tank in seconds.
6. Divide the number of gallons collected in Step 3 by the number of seconds in Step 5.
7. Multiply the answer from Step 6 by 60.
8. The answer in Step 7 is the average pumping capacity of the pump in gallons per minute (GPM).

Step Two: How Much Chlorine Should Be Injected? Determine the parts per million of chlorine you are trying to achieve in parts per million (PPM).

Chlorine is injected in parts per million ('ppm') which is the same as saying milligrams per liter ('mg/L'). The amount of chlorine to add depends on the "chlorine demand" of the water. Chlorine demand is the amount of various contaminants in the water that combine with the chlorine after the chlorine has been injected and sufficient contact time has occurred. After the chlorine has combined with the various substances such as bacteria, iron, manganese and odor, some level of uncombined or "free" chlorine will exist. The goal is to have some small amount of free-chlorine, usually around 0.2 to 0.4 ppm of free-chlorine, up to a maximum of 1.0 ppm of free-chlorine.

For bacteria you want to inject 1 – 2 ppm of chlorine with approximately 10 minutes of contact time. If the water is colder than 50F (10C) and/or the pH is higher than 7.5 you may need longer contact time or a higher residual.

For each part per million of iron or manganese generally you want to inject 1 ppm of chlorine. For each 1.0 ppm of hydrogen sulfide gas (which causes the rotten egg smell in water) you want to inject 2 to 3 ppm of chlorine. So say you have bacteria and 2.0 ppm of iron. For our example here, we will assume you want to inject 3 ppm of chlorine.

Step Three: Determine what solution strength of bleach to use

Household bleach is approximately 5% chlorine; pool chlorine is 10 to 12%. 5% is the same as saying 50,000 parts per million (PPM) and 10% is the same as saying 100,000 PPM.

Regarding the solution strength: If you dilute the bleach by using 1 gallons of pure water to 1 gallon of household bleach, you end up with solution strength of approximately 2.5% or 25,000 ppm. In other words, household bleach has a solution strength of 50,000 ppm, and if you dilute it with 1 gallon of water, you end up with solution strength of 25,000 ppm.

Regarding setting the output of the metering pump: You can vary the applied dosage of chlorine by adjusting the chlorine bleach solution strength and setting the Stenner Feed Rate Control Dial until you achieve the desired residual.

After you use the formula below to compute the gallons per day adjust the pump to end up with the desired applied dosage. The formula is simple, you only have to:

Multiply the Flow Rate (in gallons per minute) times the Applied Dosage in Parts Per Million Desired times 1440. Then divide by the Solution Strength in PPM that is being used.

Example: Assume that you have a well pump that has a flow rate of 12 gallons per minute (12 GPM) and that you want to inject 3.0 ppm of chlorine into the water. You have decided to use a solution strength of 25,000 ppm or 1 gallon of 5% bleach to one gallon of purified or at least softened water. There are 1440 minutes in 24 hour period, and the formula will tell you how many gallons of chlorine you will use for every 24 hours the well pump runs.

The formula is: $12 \text{ GPM} \times 3.0 \text{ PPM} \times 1440$ and then divided by 25,000 = 2.07 Gallons Per Day

This means that you need a metering pump that has an output of 2.0 gallons per day. You can use the Stenner 45MHP2, which has a maximum output of 3 gallons per day, and set the pump at the 66% level, since 2 is 66% of 3, the maximum output of the pump. Theoretically this will give you an applied chlorine dose of 3.0 ppm, and you can adjust it later once you determine your actual free-chlorine residual. The Stenner pump has a Feed Rate Control Dial with numbers from 1 to 10. If you set the pump at 6 or between 6 and 7, you will have the desired adjustment of 66%.

Your well pump might run for 1 hour a day, so at this rate you would use 2.0 gallons of your chlorine bleach solution every 24 hours the pump runs. It is better to add more solution every one to two months as the solution can lose its potency over time.

Whatever your initial setting be sure to test for total and free-chlorine and then adjust the pump and/or the solution strength to achieve your desired free-chlorine residual in your piping.

NOTE: if you find you do need to dilute the bleach, use only distilled water, water from a reverse osmosis system, or at least softened water. Do not use untreated well water.

Maintenance: Check free-chlorine residual at least once per month and adjust Stenner pump and/or solution strength if needed. See the Stenner manual for routine maintenance. Change the pump tube every 1 – 3 years.

Winterizing: do not let the Stenner pump or tubing freeze. If you need to winterize, drain the chlorine solution tank and discard chlorine solution. Place the suction of the pump into a bucket of clean water and allow the pump to run until the Stenner pump is free of any chlorine solution. Remove the suction from the water, and allow the pump to pump dry. Pump is ready to store.