

# Stenner Pump PCM Proportional Feed 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. If you are going to be turning off the water to you house and you have an electric water heater, shut off the power to the water heater before beginning installation.
2. 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.

## Installation

See typical installation for well water Fig 1. Pressure tank refers to your existing pressure tank. If you don't have a pressure tank, install the chlorination system on the main line to the home or building.

Fig 1: Typical installation with contact tank and optional carbon backwash or iron filter

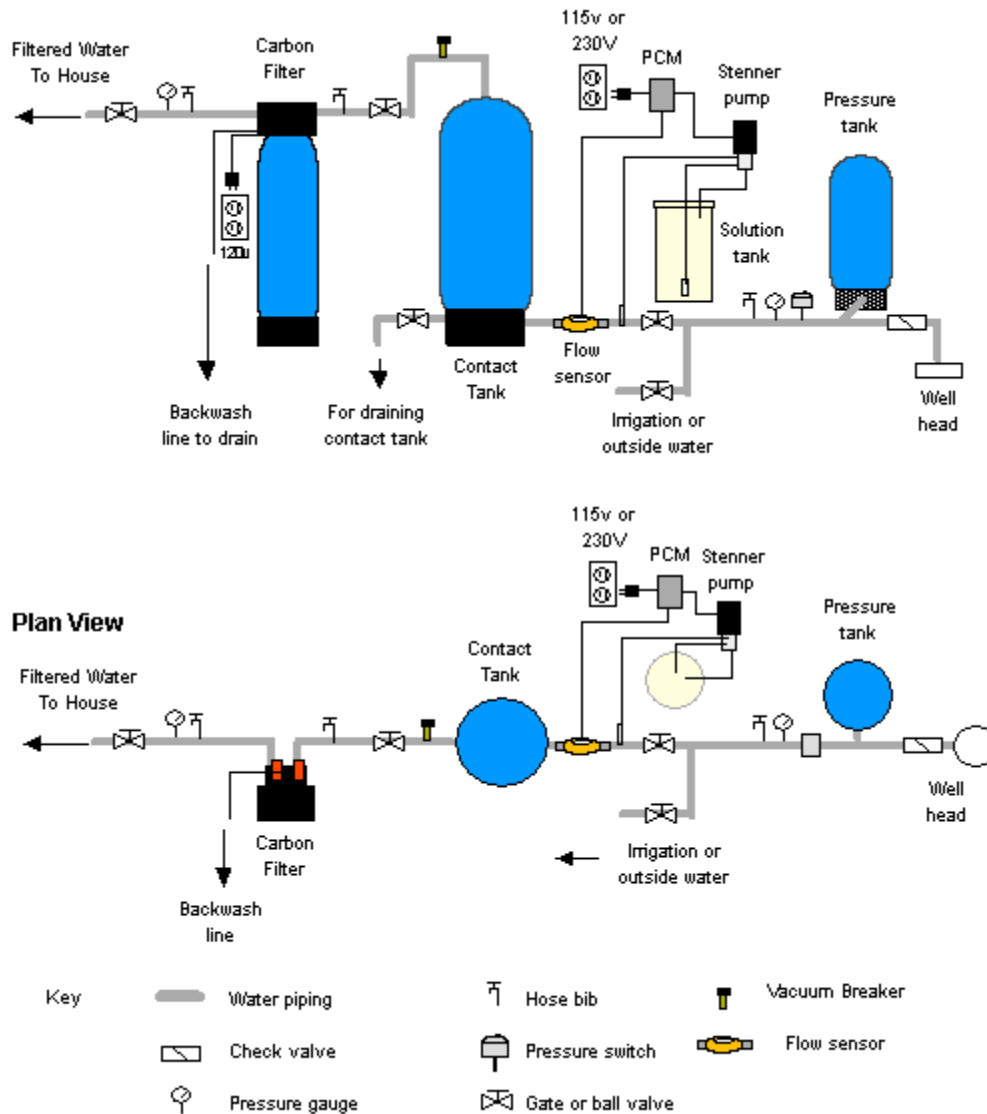


Fig 2: Proportional Feed Stenner connections

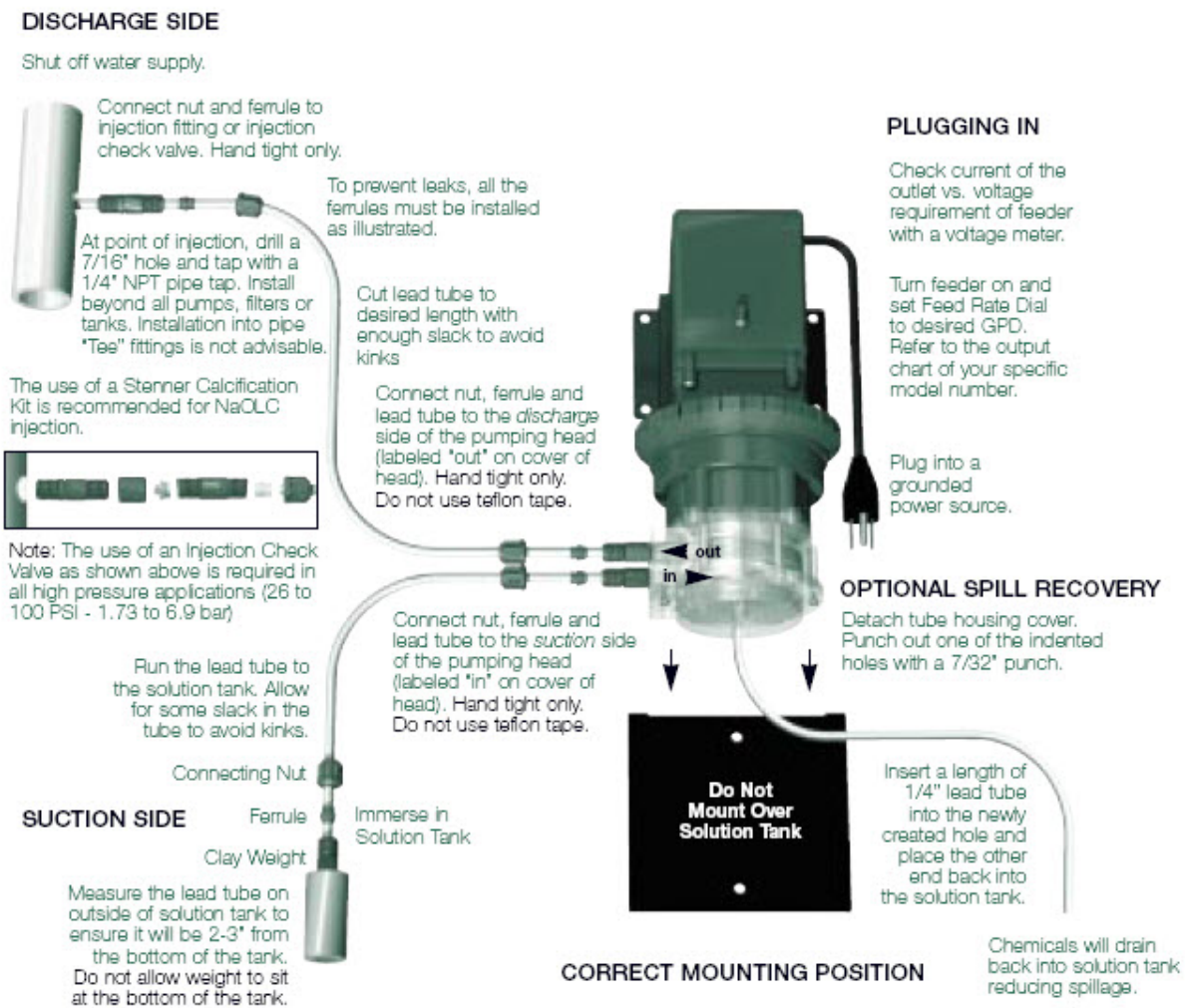


**Regarding optional vacuum breaker on contact tank:** the contact tank can withstand a line pressure of 75 PSI, but cannot take any vacuum. If the contact tank is drained or if the well system loses pressure, and water accidentally drains back down the well, or is drained after contact tank and a hose 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.

**Installation Instructions** - Follow instructions in the Stenner Classic Series Installation and Maintenance Manual, and PCM 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**



**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 and/or adjusting the PCM knob 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: 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 elements and bacteria 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 Two: 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, or adjust the PCM rate knob.

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.

### **Step Three: Determine what the PCM setting and pump setting:**

Open all fixtures and reading water meter, determine what your maximum flow rate is in gallons per minute. For this example below, we assume a maximum flow rate of 15 GPM.

- Assume a maximum flow rate of 15 gallons per minute.
- As a starting point we can estimate the chlorine demand (the amount of chlorine required to be injected) at 2 ppm, based on 1.0 ppm of iron and 0.5 ppm of manganese. You may need more or less but you can adjust the pump or settings later after you get the system running and test the actual free-chlorine residual.
- Assume a solution strength of 10,000 ppm (dilute one gallon of household bleach with 4 gallons of water)
- Water meter contracts are: 1 gallon per pulse

Steps (these steps are also listed in the PCM manual)

1. Determine available dose time: divide 60 seconds by the maximum system flow rate in GPM:  $60 / 15 = 4$  seconds per gallon

2. Calculate dose required:  $15 \text{ GPM} \times 2 \text{ PPM} \times 1440$  divided by  $10,000 = 4.3$  gallons per day. This means that at this setting, the metering pump would pump 4.3 gallons of the chlorine solution in 24 hours of the well pump running.

3. Select pump: 45MHP10 which can pump 10 gallons per day.

4. Determine feed time duration (seconds), (gpd required divided by gpd selected pump x available dose time in seconds = feed time duration):

$$4.3 / 10 \times 4 = 1.72$$

5. Determining PCM model and setting: select PCM5 which has 0.5 to 5.0 time range in seconds. To determine % setting of the PCM, divide feed time duration (Step 4) by maximum seconds of PCM model and multiply by 100:  $1.72 / 5 \times 100 = 34\%$

### **Summary: to inject 2 ppm of chlorine:**

Solution strength: 1 gallon of household bleach to 4 gallons of water, or 1/2 gallon of 10% pool bleach to 4 gallons of water. Set PCM to 34%

**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.