



Hydromix

Anti-Scaling and pH proportioning System



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Safety Guidelines

- ◆ Follow all state and local codes.
- ◆ Protect from impact damage and install with adequate, redundant leak protection.
- ◆ Regulate inlet at 40 - 80 PSI (UPC Code 608.2)
- ◆ Operating temperature 40°-100° F
- ◆ Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system
- ◆ Protect the unit from freezing.
- ◆ Protect from excessive exposure including UV, rain, high temperatures etc.
- ◆ CAUTION! pH adjustment chemicals can be dangerous! Personal Protection Equipment (PPE) must be worn when mixing or handling chemicals including but not limited to eye protection, face shields, gloves and proper clothing. Serious injury or death can occur from exposure to certain chemicals. Always add pH adjusting chemicals to water. Never add water to the pH adjusting chemicals. Store chemicals properly and never store different pH adjusting chemicals near each other. Store oxidizing chemicals separately. This system must not be accessible to children or those without proper training and a strong understanding of the potential dangers this type of equipment can pose.

General Description

The proportional pH adjusting systems is a chemical injection system that automatically adjusts the water pH so as to maintain the desired lower or higher pH regardless of water flow. A sample port and a handheld pH meter are used to adjust the chemical pump rate to deliver the desired pH consistently. Sampling should be done well after the injection point so as to allow the pH adjusting injection and the treated water adequate time to blend. A static mixer is highly recommended and is available as an option. The chemical pumps are easily adjusted as is the solution strength to accommodate a wide variety of applications. Contact Freedom Water for assistance in designing systems outside of these general parameters.

Intended Use

This unit is ideal for most residential and many light commercial applications. Flow rates up to 20 GPM can have their pH corrected with this simple design. "Neutra-5" is ideal for pre-treatment and raising the pH for iron reduction systems. Neutra-7 includes polyphosphate and is ideal for post treatment where polyphosphate can be beneficial for protecting copper and metal plumbing. Do not use "Neutra-7" ahead of carbon, Katalox Light, Filter-Ox or other medias that can become damaged with polyphosphate. Ban-T is food grade citric acid that is ideal for lowering the pH in lieu of a traditional anion based dealkalizer.

Stenner Econ-FP Pump, 3/4" or 1" Meter, 30 Gallon Chemical Tank

The Stenner Econ-FP 30 GPD pump and 30 gallon chemical tank come pre-assembled for easier installation. The 3/4" flow meter is rated for up to 22 GPM and the 1" meter is rated to 50 GPM. Larger meters and chemical tanks are available. The dilution instructions below can accommodate up to 20 GPM flow rates in most applications.

Connect the red and black wires from the Econ-FP pump to the black and red wires from the flow meter. All other wires should be capped. These wires are not energized and can simply be folded back and taped. If the job will be inspected we recommend putting the wires inside of an enclosure to eliminate the potential of an inspector being confused or concerned.



Programming the Stenner Econ-FP

- 1: Plug the Stenner Econ-FP power cord into a continuously energized 110v outlet and program. Remove the screw that secures the plastic cover over the display/keyboard.
- 2: To make changes to the settings the pump must be unlocked. If the pump is locked, push and hold the **MODE** and the **%** buttons at the same time and hold them for 5 seconds. The "pump locked" will disappear. If "STANDBY" is on the screen, push and hold the **MODE** and **STBY** buttons and "STANDBY" will disappear.
- 3: Change the "**MODE**" to "**5 SECONDS**", hold the **MODE** button while using the **↑** or **↓** arrows to change the setting.
- 4: Change the percentage to 30%, press and hold the **%** button while using the **↑** or **↓** arrows to change the percentage to the desired rate.

Chemical Dilution Guidelines For Neutra-5/Neutra-7/Soda Ash

1. Add 5 gallon of clean water to the chemical mixing tank. Water temperature must be above 65°F. If your water temperature will be lower, the Soda Ash may have difficulty staying in solution. A mixer should be installed to prevent caking of the chemicals.
2. If you have the optional tank mixing system, turn it on and leave it on while slowly adding the Neutra-5/Neutra-7/Soda Ash.
3. Add 4 cups (5 pounds) of Neutra-5 or Neutra-7 to the water in the chemical mixing tank stirring constantly to ensure the chemical dissolves completely.
4. Run the water at the location for 10 minutes and test the pH. Adjust the % up or down to achieve your desired pH level.

Chemical Dilution Guidelines For Ban-T (Food Grade Citric Acid)

1. Add 5 gallon of clean water to the chemical mixing tank. Water temperature must be above 60°F.
2. If you have the optional tank mixing system, turn it on and leave it on while slowly adding the Ban-T.
3. pH reducing using "Ban-T" (Citric Acid). Mix 1/2 pound (1 cup) of "Ban T" into 5 gallons of clean treated water and mix well.
4. Run the water at the location for 10 minutes and test the pH. Adjust the % up or down to achieve your desired pH level. Adding more Ban-T can be done to increase the pH if adjusting the pump to **100%** does not raise you pH high enough.

These are generic starting points. By adjusting the pump settings and the dilution rates very accurate pH control can be achieved. Regular testing and adjustments may be necessary.

Neutra-5, Netra-7, Soda Ash, Ban-T

These are generic starting points. By adjusting the pump settings and the dilution rates very accurate pH control can be achieved. Regular testing and adjustments may be necessary depending on may factors. Freedom Water offers both inline pH meters and simple pocket pH meters. Calibration of your pH meters is important and must not be ignored.

Adjusting the pH

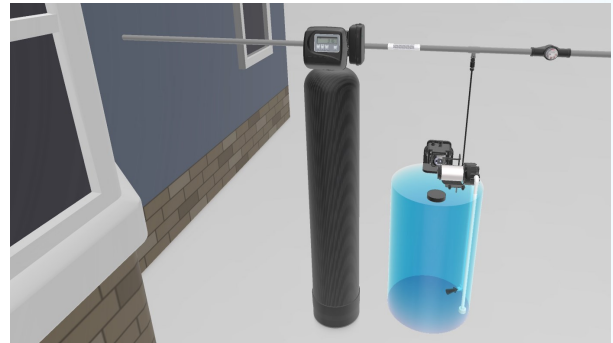
1. To make changes to the settings the pump must be unlocked. If the pump is locked, push and hold the **MODE** and the **%** buttons at the same time and hold them for 5 seconds. The "**KEYBOARD LOCKED**" sentence will disappear. If "**STANDBY**" is on the screen. Push and hold the **MODE** and **STBY** buttons and "**STANDBY**" will disappear.
2. Push and hold the **Mode & PRIME** buttons until the solution reaches the injection point in the plumbing.
3. Run water so that the meter and pump begin to operate and inject the pH adjusting chemical into the water supply. Let this run for no less than 5 minutes and test the pH at a sample port at least several feet away from the injection point.
4. Adjusting the "**Seconds**" and "**Percentage**" may be necessary. A pump with a mode setting of "**5 SECONDS**" with a percentage setting of "**50%**" will engage for 2.5 seconds. The same pump set at "**25%**" will engage for 1.25 seconds.
5. If the system is under-dosing the pump % rates would be increased. If the pump is overdosing, the pump % rate should be decreased.
6. An inline static mixer or small contact tank should be installed for more consistent pH correction.

Maintenance

1. Refill Chemical tank with proper dilution as needed. Typical is 5 pounds of Neutra-5 or Neutra-7 or 1/2 pound of Ban-T into 5 gallons of clean water
2. The "H" pump tube and injection Duck Bill Check Valve should be change annually or more often in heavy use applications.
3. The Econ-FP Black Roller Assembly should be changed every 2 years or more often in Heavy use applications.
4. The complete pump assembly should b replaced every 5 years under normal use conditions.

Soda Ash (Neutra-5, Neutra-7, Sodium Carbonate, Na_2CO_3) can be used to raise the pH of acidic water without raising the hardness. If you are dealing with low hardness and low pH, chemical injection usually makes more sense versus a calcite filter which can significantly raise the hardness of water. If your water is already hard and a softener is going to be installed a calcite neutralizing system may make sense. Soda Ash solubility is highly variable based on the water temperature. One gallon of 50°F water can dissolve ~1 pound of Soda Ash. At 68° water can dissolve approximately 1.75 pounds of Soda Ash. ~0.926 pounds of Soda Ash in one gallon of water will make a 10% solution (100,000 ppm) and it is common to inject between 50-500 ppm of Soda Ash to increase the pH of your water. To get the correct injection amount some trial and error will be necessary. Each ppm of CO_2 is neutralized with 2.5 ppm of Soda ash. Only .85 ppm of Caustic Soda (Sodium Hydroxide, Lye, NaOH) would be needed to neutralize 1 ppm of CO_2 . Caustic Soda should only be used commercially by qualified personnel as it is far more dangerous to work with than Soda Ash and a failure in the chemical injection system can cause dangerously high pH levels in the plumbing. Use the chart below as a good starting point to raise the pH of your water. Using the Econ-FP with a meter is preferred over non metered injection systems if the water flow rate will vary. Larger pumps are available for higher flow rate applications.

~Soda Ash Chart Pounds per Gallon of Water (Do not exceed 1.5 pounds per Gallon)				
Pounds	.93	1	1.25	1.5
PPM	100,000	110,000	135,000	160,000
Dilution	10%	11%	13.5%	16%
Cups	.6	.75	.95	1.15



Setting the Chemical Tank Mixer

The chemical tank mixer is a unique and simple device that can prevent the chemical tank from becoming fouled with sludge that is common with many chemicals especially Neutra-5, Neutra-7 and Soda Ash. Set the pump to recirculate for 3 minutes every 6 hours. Adjust as needed. See the instructions included with the electronic timer for more details.

Order of Installation

Chemical injection systems can be installed before or after treatment. Contact Freedom Water for more details on the best way to install you pH adjusting system.

i5 Valve w/Meter

If your system will include an i5 valve with a flow meter, you can use the relay driver on the valve to operate the pump in place of a separate meter. Insert the pumps **BLUE** wire into the **"COM"** and the **BROWN** wire into the **"RLY1"** connector on the i5 electronic board. If **RLY1** is already being used you can connect the **BROWN** wire into the **RLY2** connector. Program the relay in OEM programming mode by pressing the **"Next"** and **"↓"** buttons simultaneously for 8 second. Press the **"NEXT"** multiple times to advance to the **"SET RELAY 1"** or **"SET RELAY 2"** programming screen. Press the **"↓"** to change this setting **"VOLUME"** and press **"NEXT"**. **"RELAY 1 SETPOINT"** will appear, use the **"↑"** or **"↓"** buttons to set this to **"1.0 GAL"** then press **"NEXT"**. **"RELAY 1 DURATION"** will appear on the screen, use the **"↑"** or **"↓"** buttons to set this to **"0:03 MIN"** and Press **"NEXT"** multiple times to exit programming mode. Set the **ECON-FP** pump to **"AUXILLARY 50%"**. Run the chemical injection system for at least 5 minutes and test the water. Raising or lowering the pH can be done by increasing/decreasing the time on the i5 valve and/or the **"AUXILLARY %"** on the **ECON-FP** pump.

