TERMINATOR™

Water Treatment System



Eliminate iron, sulphur and turbidity without the use of expensive chemicals with The TERMINATOR™. The TERMINATOR™ can correct rusty water stains and rotten egg odors through its filtration system. Periodic backwashing is all that is required to keep The TERMINATOR™ working at peak performance.

TERMINATOR™ Plus

The TERMINATOR PLUS™ system incorporates all of the time tested features of The TERMINATOR™ with the added ability to control low pH.

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TERMINATOR SYSTEMS

The Terminator™ water filtration systems have the capability of removing Iron, Sulfur, Manganese and Turbidity from water. The Terminator Plus™ systems combine all of the removal capabilities of the Terminator™ with the additional ability to raise the pH of acid waters. The Terminator™ systems perform all of the functions without the use of chemical regenerants like potassium permanganate, chlorine or sodium chloride. Please note that both the Terminator™ and Terminator Plus™ systems will not remove Hardness. A properly sized Water Softener should be installed to correct Hard water problems.

Water Chemistry

All water treatment devices, including the Terminator™ systems, possess different capabilities and limitations. A complete water analysis, an understanding of the capabilities of the homeowners water system and proper sizing all contribute to a successful installation.

IRON

Iron is a very common element often present in groundwater in amounts ranging from 0.01 to 10.00 ppm (mg/L). Iron may be found in three forms: (1) Ferrous Iron which is dissolved in the water and appears clear; (2) Ferric Iron which is suspended in water and visible as “rusty” water; or (3) Iron Bacteria which is a living organism.

The Terminator™ Systems precipitate dissolved solids like ferrous, or clear water, iron into suspended solids. This process is accomplished by introducing air into the water supply thru the air injector which precipitates or oxidizes these solids and filtering them from the water with the filter media. Ferric Iron, which exists in the suspended form, is simply removed by the filter media bed.

Iron Bacteria may be detected in the water supply by examining a toilet tank in the home. Long, stringy globs of iron present in the tank indicate the possible presence of Iron Bacteria. Iron Bacteria require iron to survive. As an iron remover, the Terminator™ Systems can control small amounts of iron bacteria. A small amount of chlorine should be introduced into the system periodically to control fouling. This is accomplished by attaching a small tube to the injection fitting on the air injector and introducing the tube into a cup of bleach. The chlorine will be drawn into the system when the pump is operating and a vacuum is created across the injector. Serious Iron Bacteria problems should be treated with an alternative treatment device and the Terminator™ Systems should not be installed.

MANGANESE

Manganese causes dark brown or black staining of fixtures and clothing to occur. Manganese usually exists with Iron. The Terminator™ Systems are capable of removing Manganese when there is an Iron to Manganese ratio of at least 10 to 1 and there is sufficient air draw into the system. For example, if a water analysis shows an Iron concentration of 10 ppm and a Manganese concentration of 1 ppm the Terminator™ Systems should remove the Manganese as long as the pH is not too low. Do not apply the Terminator™ Systems on water supplies where there is Manganese present without Iron. An alternative treatment device should be installed.

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SULFUR

Sulfur, or Hydrogen Sulfide, possesses a “rotten egg” smell when present in water. The Terminator™ Systems are capable of handling concentrations up to 4 ppm of sulfur. The air introduced into the system by the air injector and the mixing that occurs in the Terminator™ mixing tank all contribute to the removal of Sulfur.

pH

The standard Terminator™ systems will slightly raise the pH of water by removing the carbon dioxide present. A high level of carbon dioxide in water can form carbonic acid which lowers the pH. The oxygen introduced by the air injector and the mixing tank reduces the carbon dioxide making the water less corrosive.

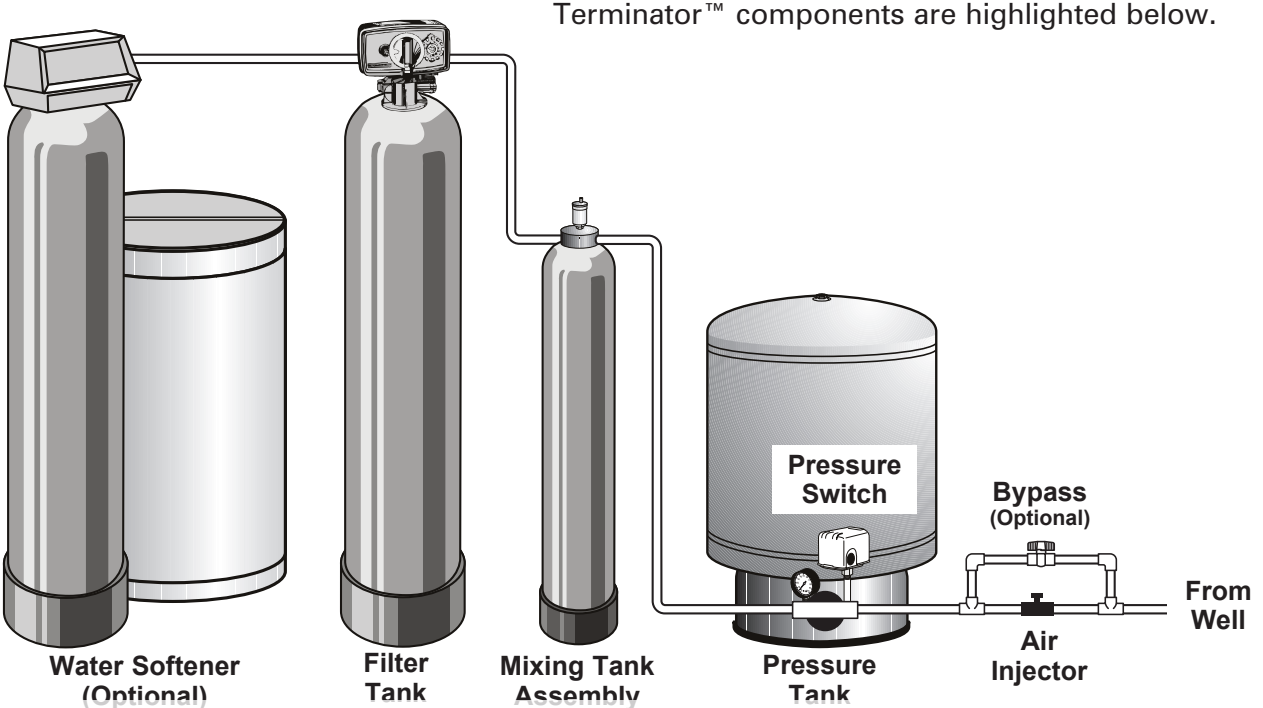
The Terminator™ Plus Systems contain an additional filter media in the filter bed designed to raise pH. This media will slowly dissolve into the water supply making it necessary to be replaced approximately every 12 to 24 months.

HARDNESS

As previously mentioned, the Terminator™ systems will not remove hardness. A properly sized water softener should be installed after the Terminator™ System.

Principles of Operation

The Terminator™ Systems consist of an air injector, mixing tank and filter tank. The other basic equipment that should be installed or exist as part of the water system and the Terminator™ components are highlighted below.

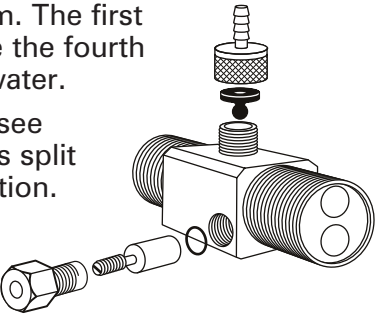


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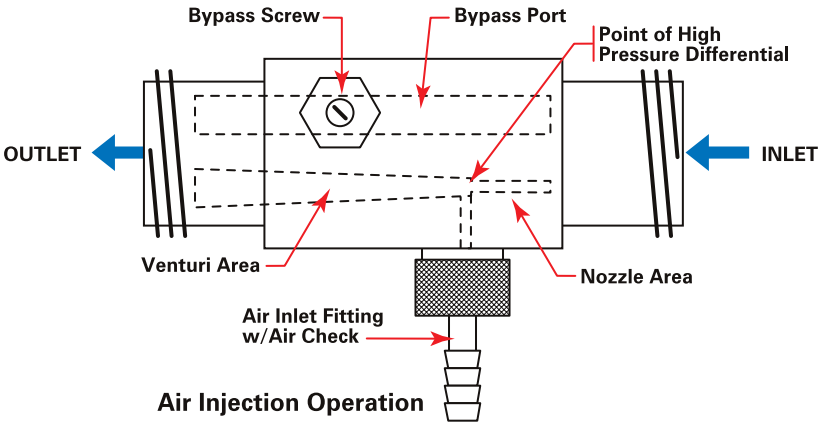
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A. Air Injector

- There are four types of air injectors available for the system. The first three described operate on a nozzle/venturi concept where the fourth option is an air pump which actually pumps air into your water.



The operation **of the nozzle/venturi air injector** - As you can see by the diagram to the right, as water enters the air injector it is split between the nozzle portion of the injector and the bypass portion. The amount of water entering the nozzle area is regulated by the bypass screw. The further the screw is tightened (clockwise) into the air injector the greater the flow of water into the nozzle. As the water is restricted into the nozzle and enters the venturi a vacuum is formed at this point. This vacuum creates the air draw into the water. As mentioned, the further the bypass screw is tightened into the air injector the greater the air draw during the pump cycle. Also, as the air draw increases the water flow rate through the air injector and to the home decreases. As you attempt to achieve a minimum air draw of 50% of the pump cycle it should be noted that the water flow rate to the home should not be less than the backwash flow rate to the Terminator™ filter or other water treatment devices on the system.



Air Injection Operation

The Waterite W-988 Air Injector

- This is the standard air injector included with all Terminator™ systems. This plastic air injector features plumbing connections of 1" Male Threads and a flow range for effective air draw of 3.8 - 16 GPM.



The Dema 206B Air Injector

- This optional injector is constructed of solid brass with 3/4" Female threads and features a flow range for effective air draw of 5.3 - 17 GPM.



The Dema 204B Air Injector

- This optional injector is constructed of solid brass with 1/2" Female threads and features a flow range for effective air draw of 2.9 - 9.5 GPM. While this air injector achieves air draws at lower flow rates, it should be noted once again that you cannot reduce the water flow rate below the backwash rate of your equipment.

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Special Notation Regarding Air Injectors – You may want to consider installing a “bypass” around the air injector. The installation of a “bypass” allows you the opportunity to fine tune your water flow and air draw. A “bypass” may be constructed by simply installing a tee before the air injector, plumbing to a ball valve from the branch of the tee then reintroducing the water flow downstream of the air injector.

Air Pump

- An air pump wired to the pressure switch on your pressure tank can be a great option of jet pump systems and other systems with low flow rates. The air pump actually pumps air into your water line oxidizing dissolved solids without the restriction of an air injector. Consult the installation diagram provided with the air pump for proper application.

B. Pressure Switch

A good quality pressure switch should be installed after the air injector and before the Pressure Tank. The switch should be set to turn the well pump on at a minimum of 30 psi and off at 50 psi. Please keep in mind that the pressure switch must be installed **AFTER** the air injector as illustrated.

C. Pressure Tank

A good quality pressure tank should be installed to insure sufficient run time on the well pump.

D. The Mixing Tank

Residential Applications with Honeywell Air Release: As oxygenated water enters the mixing tank it is sprayed thru a series of holes enhancing the oxidation process and venting excess oxygen from the water supply. Water is picked-up off of the bottom of the tank by an outlet tube as it exits the tank. The excess air is picked-up by a small tube and vents to an air release located on the top of the mixing tank. The air release features both an on and off position which allows for disassembly without turning off the entire system. The air release should be in the OPEN position when operation allowing excess air to vent to drain. The air release fitting and tubing should be attached to the air release and run to an open drain. The tubing will direct any water discharged by the air release to the drain. Make sure you adhere to local plumbing codes when installing this tubing at the drain.

Applications with Universal Tank: As oxygenated water enters the branch of the inlet tee it drops into the top of the tank thru the air pocket. Water is picked-up by the outlet tube in the bottom of the tank. The excess air is released thru the Whitewater Air Release located inside the tank. Properly plumb drain tubing from the top of the tank to an open drain. The drain tubing will direct any water discharged by the air release to the drain. Make sure you adhere to local plumbing codes when installing this tubing to the drain. See the installation instructions provided with the air release for additional information.

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E. The Filter Tank

As the oxygenated water enters the filter tank the precipitated iron is filtered by the media in the tank and any dissolved iron left in the water is removed by the media. The Filter tank should be backwashed approximately every three days to clean the bed and redistribute the filter media.

F. The Filter Media

The media in the filter tank is a blend of media's designed to maximize the effectiveness of the Terminator™ system.

Terminator™ Systems

The standard Terminator™ systems contain a mixture of BIRM and FILTER AG.

BIRM

Birm is the tradename for a manganese dioxide-coated aluminum silicate used as an oxidizing-catalyst filter for iron and manganese reduction.

FILTER AG

Filter Ag is the tradename for an aluminum silicate (pumcite) granular product used as a general purpose filter medium.

Terminator™ Plus Systems

The Terminator™ Plus systems contain a mixture of BIRM, FILTER AG, CALCITE & COROSEX.

CALCITE

Calcite is a finely ground marble or limestone which is used to raise the pH reading of low pH (acidic) water.

COROSEX

Corosex is a reactive magnesium oxide used to correct low pH conditions of water.

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System Specifications

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GENERAL SPECIFICATIONS FOR TERMINATOR & TERMINATOR PLUS SYSTEMS

Model Number	Control Valve Model	Mineral Tank Size	Air Mix Tank Size	Air Injector Type	Service Max.	Backwash Minimum	Mineral Mixed Blend (cu. ft.)	Gravel (lbs.)
T1000	Fleck 5600	10" x 44"	8" x 44"	Waterite	4.0	5.0	1.0	20
T1500	Fleck 5600	10" x 54"	8" x 44"	Waterite	5.0	5.0	1.5	20
T2000	Fleck 2510	12" x 48"	16" x 57-¼"	Waterite	7.0	7.0	2.0	20
T2500	Fleck 2510	13" x 54"	16" x 57-¼"	Waterite	8.0	10.0	2.5	30
T3500	Fleck 2750	14" x 65"	16" x 57-¼"	Dema 3/4"	10.0	12.0	3.5	35
T4000	Fleck 2750	16" x 65"	21" x 62-¾"	Dema 3/4"	12.0	15.0	4.0	75
T5000	Fleck 2850	18" x 65"	21" x 62-¾"	Dema 1"	15.0	20.0	5.0	150
T7000	Fleck 2850	21" x 62"	21" x 62-¾"	Air Pump	20.0	25.0	7.0	150
T10000	Fleck 2900	24" x 72"	(2) 21" x 62-¾"	Air Pump	25.0	35.0	10.0	200
T17000	Fleck 2900	30" x 72"	(2) 24" x 73-¼"	Air Pump	40.0	55.0	17.0	350

Model	Ferrous Iron P.P.M.	Sulfur P.P.M.	pH	Turbidity F.T.U.	Taste, Odor and Color
Terminator	20	5	7.0 to 8.0	125	Wide App.
Terminator-Plus	20	5	6.0 to 8.0	125	Wide App.

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