

HARDNESSMASTER™

The Vitalus/Equinox Products HardnessMaster™ electronic water conditioner is an alternate way to soften water to prevent scale and scum deposits. The electronic converter produces a rapidly oscillating, pulsing signal to the water flowing in the pipe. This high frequency signal moves back and forth through the water. It affects the hard water minerals in the water, which are present as electrically charged ions. By a complex physical chemistry process, this increases the solubility of the calcium, magnesium carbonates and bicarbonates, which normally deposit as "limescale", especially on heated surfaces and around small orifices.

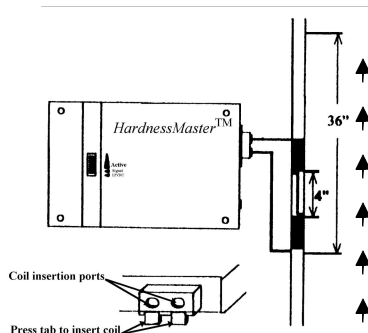
COMPONENTS

- The Frequency Converter
- Transformer with 110-volt grounded plug, 12VDC output
- Twenty (20) feet of signal cable
- 4-nylon cable ties
- 4-mounting screws
- Instruction sheets

INSTALLATION

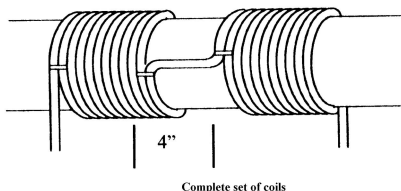
A. LOCATE THE HardnessMaster™

1. Find the pipe carrying all the water into the installation.
2. Find a straight length of 36-inches. This is optimum. A shorter length of 24-inches minimum will also work, but at less efficiency in descaling. The water needs time to complete the mineral solution process.
3. Find a 110-volt wall outlet nearby. The converter must be between 60-inches max and 12-inches minimum from the coil around the pipe. Use an extension cord, if needed.
4. Make sure the coil around the pipe will be at least 6-inches away from any pipe grounding clips and least 12-inches away from major Iron/steel objects, or electric motors and electric switching panels. Keep the coil at least one foot away from grounding straps attached to the pipe and always downstream.



B. WRAP THE SIGNAL COIL

1. The converter box must be at least 1-foot and no more than 5-feet from the signal coil on the pipe.
2. Before winding the signal wire around the pipe, make sure there is enough lead wire to reach to the converter box.
3. Wind the cable around the pipe for (12) turns. Make sure the windings are touching each other but not overlapping. At the 12th turn use a cable tie to secure it to the pipe. (See figure below)



4. Move the free end of the cable along the pipe for 4-inches, then start another coil. Tie the first coil with a cable tie to the pipe. Wind the coil in the same direction for 12 more turns. Tie the last coil with a cable tie.
5. Bring the two ends of the cable to the converter- between 1-foot and 5-feet. Cut off any unneeded length. Strip the insulation from the ends, about ¼-inch.
6. It is recommended that the coil be taped over with electrical or duct tape to hold firmly in place and protect it from abrasion and/or vibration. There is no danger of shock because the voltage in the coil is only 12 volts DC

C. ATTACH CONVERTER BOX

1. The converter box has 4-through holes at the corners of the box. Take the 4-screws supplied and fasten the box to a wall. Make sure the converter box is turned so the converter clips are facing the ends of the cable.
2. Attach the 2-coil ends to the converter box. Press down on the clips and insert the stripped end of the signal coil wire. Make sure they are all the way in. Release the clip.

D. POWER THE UNIT

1. Insert the round end of the connector from the power/transformer into the matching receptacle in the converter.
2. Plug in the power cord to the wall outlet.
3. The converter will begin operating. The light on the front pane will be scrolling up and down.
4. The indicator light will not go on if the signal wires are not connected, or if there is no power to the converter box.

NOTE: Polarity is not important for the signal coil. The unit may be left on continuously, even when the water is not being used. The power generated in the signal coil is small. There is no concern for heat buildup. This unit is for indoor use. The converter is housed in a tight enclosure and a plastic coating called "potting" further protects the electronics. In high humidity areas, or where there may be some moisture falling on the unit, the two connectors to the signal coil and the power connector should be further protected. Use silicone cement and cover the power plug connection into the converter. Cover the 2-signal wire connections at the converter box. A small amount of sealant around the edge of the converter cover can be made also.

OPERATION

1. If the establishment is new, there will be no scale on the pipes.
2. Therefore the HardnessMaster™ will operate to condition the minerals in the water to prevent scaling in the pipes and water heaters
3. On older places where scale has built up on the piping and fixtures, there will be a period of time of 60 to 90 days when "Descaling" the old deposits of limescale occurs. Most of this will go into the water. The water may appear milky and feel "harder". That is because the old scale is being put back into the water. This usually clears up in 60 to 90 days.
4. Some pipe scale will flake off and find its way into screens and sumps. You will have to clean these once or twice in the 90-day period.
5. Likewise, there may be more scum on the bathtub, and in the dishwasher. You will find the scum to be soft and will wipe off easily. Some vinegar on a cloth will help, particularly in the dishwasher.
6. If there is a water softener in the system, let it operate along with the HardnessMaster™ for about a month before turning the softener off. (The HardnessMaster™ should be installed ahead of the water softener.)
7. 230 volt operation-If the source of power is 230 volt, order a power converter/transformer for 230 volts, which will provide the proper DC voltage to the converter. There is no need to change the entire system.
8. Bar Graph Indicator
 - a. Bottom segment on-indicates the 12-volt internal voltage ON.
 - b. 2nd segment from bottom ON-signal present at the output to the coil.
 - c. Top segment flashing-indicates signal coil is connected.
9. Water Quality
Check the water analysis report from the city provider or have a water analysis made. Check for "TOTAL HARDNESS AS CaCO₃". It will be reported in PPM (parts per million). Soft water will have an analysis of 0 to 17 PPM. (1-grain) No conditioning is recommended. Slightly hard water has an analysis of 17 to 60 PPM. (1 to 3 grains) Medium hard water has an analysis of 60 to 120 PPM. (3 to 7 grains) Hard water is 120 to 180 PPM. (7 to 11 grains) Very hard water is over 180 PPM (11 grains and up). U.S. have waters that are 3-11 grains, but some areas may be as high as 42 grains.
10. Trouble Shooting
If there appears to be no effect or the conditioning has stopped, make these checks:
 - a. Check that the signal light is flashing. If not, but the lower bar is on, it means the signal coil is not connected.
 - b. If there is no signal light at all-it means there is no power to the converter. Check that the power plug to the converter is connected. Then check that the power converter is plugged in properly. Finally, check that there is power to the wall outlet. Make sure there are no operating magnetic devices nearby.

SPECIFICATIONS

- Converter dimensions: 9 ½" by 6" by 1 ½"
- Converter enclosure material: ABS plastic
- NEMA rating-of enclosure: 2 (general purpose)
- Weight: 2 ½ lbs.
- Operating temperature range: -4 to 122 deg. F
- Supply voltage required: 110 V, 60 HZ, @<500 ma.
- Power Supply: Converter output 12VDC@200ma
- Power Consumption: Less than 10 watts
- Signal Cable: 16AWG stranded, 600V.insulation
- Output Reading: Bar graph, measures internal supply volts, output to signal coil, and continuity of signal