



# Owner's Manual

# *Scale Doctor*

Residential series

*Hard Water Treatment System*

*Instructions*

*Performance guide*

*Warranties*

*Specifications*

Index of contents	Page
<b>About/General Installation</b>	<b>2-3</b>
<b>Performance Guide</b>	<b>4</b>
<b>Frequently Asked Questions</b>	<b>5</b>
<b>Indicators/User Experiences</b>	<b>6</b>
<b>Appliances</b>	<b>7</b>
<b>Guarantees</b>	<b>8</b>
<b>General Warnings</b>	<b>9</b>
<b>Installation (Indoor use only)</b>	<b>10-11</b>

Congratulations for purchasing an environmentally friendly electronic water conditioner, and thank you for choosing the Scale Doctor system to treat your home or swimming pool. Please read this short manual in its entirety for a quick and successful installation.

If you have any installation concerns please contact your supplier.

## **ABOUT THIS MANUAL**

This manual contains the information common to all models and separately at the end what pertains specifically to each model.

### **Tools needed:**

- Phillips screwdriver
- Pliers
- Wire stripper
- Drill

**IMPORTANT:** Scale Doctor does not remove hard minerals, it puts them in suspension, so a hardness test will show identical results before and after Scale Doctor treatment as it only measures minerals present.

## **INSTALLATION INSTRUCTIONS**

Locate the incoming water supply and if possible find a straight length of pipe after the water meter (if any) of at least four inches. The pipe can be horizontal, vertical or diagonal. However if there is not enough space in the house for the coil, the coil can be wrapped around the pipe outdoors. In that case cover the coil with duct tape to protect it from UV damage and moisture. If no electrical outlet is present near the installation site, consult a qualified electrician. (A grounded extension cord may be utilized as a temporary solution only)

In case the water supply is from a roof tank, install the coil after the tank. The signal coil should not be closer than six inches (15 cm) from any major steel/iron objects, motors and appliances for best performance.

Install the Scale Doctor System unit upstream of the water softener if you plan to run them together. If you have a whole house water treatment system, install the Scale Doctor downstream for best results.

The coil can be installed on any pipe material including copper, PVC, steel, galvanized, lead and fibro-cement. When the option is available, wrap the coil on PVC, as the electric fields will be more effective in plastic than in metal pipes.

### **Distance between coil and control box**

The units can be mounted 10 to 20 feet away from the coil if necessary. Do not install unit and converter closer than 6"/15 cm from the coil. We include 39 feet (13 m) of wire with the model. It takes about 14 feet (3.5 m) for 2x20 wraps of coil on a 1" (25 mm) pipe, which allows for a maximum of 12 feet (4 m) of cable length (each way) from controller to coil. It is acceptable to add another few feet of cable if necessary.

## Installing the coil

Secure the middle of the cable to the pipe with a cable tie. (Image 1). Make 20 windings with one half of the cable, starting at the vertical arrow of image 2. The horizontal arrow gives the winding direction. Secure the last winding with a cable tie. Start winding the second half of the cable on top of the first layer with 20 windings following the direction of the cable (image 3), in such a way, that when done both cable ends are on opposite sides of the pipe and on one side of the coil.(Image 4). Secure again with a cable tie. Cut the cable to appropriate length to reach the location where you will mount the energizing unit and remove 0.2” (0.5 cm) of the insulation of both cable ends. Insert the cable ends in the spring connector, polarity is not important.

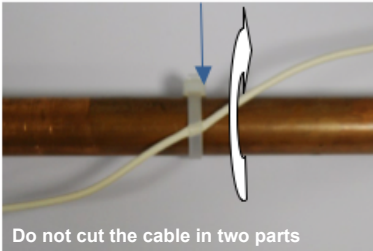


Image 1

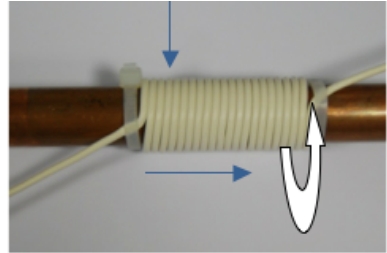


Image 2

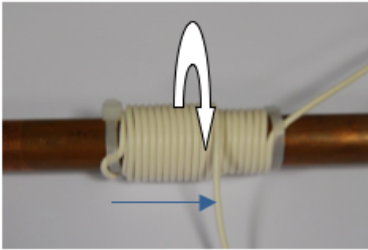


Image 3



Image 4

## Number of wraps for the coil

Although the standard coil of two layers of 20 wraps is sufficient in most cases, if your water consumption is high, continue to wrap another 10, 20 or more turns to increase the treatment time. The exact number is not important, a longer coil provides a longer treatment time increasing the performance of the Scale Doctor treatment.



Example of wrong wrapping

## Scale Doctor PERFORMANCE GUIDE

The Scale Doctor hard water conditioner system treats all incoming water as it passes the coil and alters the scaling properties of the dissolved minerals so that it does not adhere to surfaces and form hard scale.

### Your Scale Doctor System will:

- Prevent any further hard-scale buildup
- Remove the existing scale that is inside your water system
- Soften the existing hard scale around taps, basins, toilets, etc.
- Reduce soap scum and improve the lather of soap
- Make the water feel softer
- Reduce the harsh effects of hard water on skin and clothes.

### IMPORTANT NOTES

#### Clean aerator screens



During the descaling period, some deposits may collect inside the nozzles or aerator screens. Make sure to inspect those places regularly during the initial three months until no more loose scale appears: unscrew, shake loose scale, reinstall.

#### Older buildings

In older buildings with existing scale, for some time after installation, the unit will be descaling your water system. This often results in the water appearing to be harder and loose scale particles appearing in places like shower heads and aerator screens. Once interior descaling is complete, your water system will be scale-free and the Scale Doctor will deliver the best results.

#### Evaporation effect of treated water

The calcium hardness previously in solution is now in SUSPENSION in the form of a fine invisible powder which flows to the drain. As water evaporates on dishes or sinks, some white spots may become visible in a form of a fine and innocuous powder which will easily wipe away leaving no marks or spotting.

#### Water softeners

Water Softeners often leave deposits inside a water system. Therefore, if a softener is in use, you may want to allow the Scale Doctor System to remove the deposits before the softener is switched off. In that case, it is strongly recommended to leave the softener and the Scale Doctor System on, together during 7 to 14 days (depending on water usage and amount of existing deposits). You will notice your softener working more efficiently and using less salt.

#### Tankless water heaters

Tankless water heaters and radiant heating applications: periodically inspect and clean the sediment filtering screens until no more scale particles are visible.

## FREQUENTLY ASKED QUESTIONS

### **How will you know that the Scale Doctor system is working?**

The amount of time required before you experience the effects of the system varies depending on the amount of water used. Generally, signs of aggressive descaling are seen within one to two weeks. Note: The system may initially seem to be less than fully effective at times. This is due to the removal of the existing scale, which is brought back into solution briefly creating the effect of increased water hardness. Once the pre-existing scale has been removed from the pipes, the full effectiveness of the system will be experienced.

### **How can I monitor the descaling process?**

If your house or building is not new and you have pre-existing scale, your descaling process can be easily monitored as follows: Measure the hardness at the incoming hot treated water supply and treated water from a trap being frequently used, immediately after installing the Scale Doctor system, then in intervals of one to three weeks. Scale Doctor treated water hardness is typically between 5 and 15% higher than the incoming water until the descaling is complete. Thereafter, since the same amount of minerals goes thru, no change in hardness level will be measurable indicating that pre-existing scale has been eliminated.

Note: you can do this only if you want to see actual chemical proof of the process. Usually most people are satisfied by watching the external indications: if shower heads and faucets become scale free and aerator screens show no scale, you can safely assume that the Scale Doctor system has completed the descaling process and is preventing scale buildup inside the entire water system being treated.

### **What does the Scale Doctor System do that a water softener does not?**

- It removes scale buildup in hot water heaters, saving energy costs.
- Saves money by not requiring the purchase or use of salt.
- Provides salt-free water, a concern for many health-conscious people.
- Provides environmentally clean water while eliminating the discharge of salt-laden water into the water table as a result of the periodic regeneration cycle of conventional water softeners.
- Reduces the consumption of detergents.

### **What does a water softener do that a Scale Doctor System does not?**

- The water softener softens hard water by replacing the calcium and magnesium with sodium.
- The water softener adds salt in the water and drains damaging chlorides into the environment.
- The water softener requires that one purchases salt periodically.
- The softener gives a silky feeling that one cannot get rid of.
- The water softener makes the skin dry.
- The water softener requires that one wastes water for regeneration.

## **External Scale Indicators**

It is good to use external scale as a tracking reference to determine that the system is working. Areas to identify are:

- Scale around taps, sinks, etc. will begin to soften, provided that the newly treated water is in regular contact with the area. Once softened, the deposits will disappear on their own, or they can be easily removed using a stiff scouring pad.
- Surfaces in contact or splashed with water become easier to clean.
- Scale on shower heads softens and disappears, periodic shower head cleaning or replacement becomes unnecessary.

## **Internal Scale Indicators**

- As the heating element inside your hot water system is descaling, water heating will become progressively more efficient. Water will then heat faster saving up to 30% in energy use. You may save additional energy by reducing thermostat settings while still having sufficient hot water.
- If the water system was severely scaled, an improvement in water flow also may be noticed.

## **Soap, scum, and skin effects**

You will usually notice:

- A reduction of around 20% in soap detergents needed.
- Less scum forms on the bathtub and there is improved soap lather.
- A great improvement in skin condition for anyone suffering from dry or itchy skin. Even those with normal skin can expect improvements and reduction in the use of hand creams.

## **TYPICAL USER EXPERIENCES**

### **Soft water feeling**

The treated water is immediately altered and will start dissolving scale buildup in the pipes. The hard scale dissolves one particle at a time, so there are no problems with clogging filters or screens in the plumbing system. If you have never used a water softener before, you will experience a dramatic difference in the “feel” of the water. The water will have a softer feeling and you will notice that your hair is “squeaky clean” after a shampoo. You will experience that Scale Doctor treated water cleans better.

### **Reverse osmosis systems**

The Scale Doctor System will gradually clean up scale deposits clogging the Reverse Osmosis membrane resulting in longer lifetime and more efficient drinking water production.

### **Replacing a salt based water softener**

If you have replaced a salt water softener, you may notice the water becoming harder as the scale begins dissolving. You may wonder, “What have I done here?” Do not worry. This is a consequence of descaling, and the condition will improve daily as the scale is removed. Your plumbing took years to get full of scale. However, it only takes a short time to clean it up. This period may be brief for a newer home, or take several months for older homes with low water usage. We recommend draining your water heater regularly to shorten the descaling process. (The suspended hardness and loosened scale tend to settle down at the bottom and should be removed by draining)

## **Espresso machines, electric kettles and other appliances where water does not circulate**

Scale Doctor treated water will show a significant improvement in the scale condition of these appliances as compared with untreated water. However, compared with salt softened water the results will not be as good, yet, health experts strongly discouraged to drink salt softened water for obvious health reasons.

### **Dishwasher**

If you use a dishwasher and had pre-existing scale, you may notice increased spotting or a White film. This situation will diminish when the descaling of pre-existing deposits is completed. If you experience this problem, you can easily solve it with the use of a good rinser like: Lemishine, found at your local Target or Wal-Mart, or from [www.lemishine.com](http://www.lemishine.com). You will get sparkling glasses every time, guaranteed. Some people recommend using one tablespoon of Lemishine along with your regular Dishwasher soap or with Cascade Complete (Granular) for picture perfect results. If Lemishine is not available in your country, experiment with any good rinser.

### **Bathroom fixtures**

You should notice that spots on chrome or stainless fixtures, the toilet bowl, tub and glass shower stall come off easier with normal cleaning after the first several weeks of use. Another benefit of the Scale Doctor system is that the naturally present microorganisms causing black mold in the bath area will diminish and then disappear completely.

### **Scale in toilet bowls**

To remove pre existent scale, use a pumice stone (found at any hardware store) to easily remove white or rust (brown) scale. Work it with confidence; it will not scratch the ceramic.

### **Back splashing stains**

One common problem is existing scale buildup caused by back splashing on faucets and tub/shower enclosures. Since there is not direct water flow across these surfaces, unlike inside a pipe, the scale can be easily removed manually as it gets softer. After initial cleaning, there will be no new accumulations.

### **After the first 90 days**

All descaling should be complete and you will be left with:

- Soft-feeling water from every tap.
- Clean pipes, faucets and shower heads.
- Cleaner dishes, sinks, tubs and shower stalls.
- Savings in energy and detergent expenses.

Check the Scale Doctor control panel periodically: It is recommended that you verify that the green LED lights on the control panel are on. You should verify this at least twice a year. The practical ramifications of Scale Doctor water treatment extend far beyond mere softening. The descaling action can have a huge energy cost reduction impact for residential, commercial and industrial property owners while reducing greenhouse gas emissions. For commercial or industrial models please contact our friendly customer service.



## THE SCALE DOCTOR GUARANTEES

### Performance guarantee twelve months

The Scale Doctor system will prevent or highly reduce accumulation of scale in your pipes, faucets, shower heads, water heaters and other water appliances. If you are not satisfied with the results after SIX MONTHS of continuous use, take the following steps:

- Check that the green LED's of the bar graph are flashing.
- Check that signal coil is correctly wrapped and connected (see installation instructions for details).
- Check that the signal coil is not closer than 6 inch (15 cm) from any major steel/iron objects, motors and appliances.

This guarantee does not include the total elimination of scale in non-free flowing water systems such as steam generators and kettles.

If you are still not satisfied, then contact your supplier, who may be able to advise on an alternative method of installation. You must call or email your supplier before disconnecting the system.

Should he be unable to assist in resolving the problem, then you will be given a REFUND OF 100% OF YOUR PURCHASE PRICE upon return of the unit in good condition including proof of purchase, freight prepaid, within TWELVE MONTHS, but having used the product for at least six months, from the date on which you received the product.

### Manufacturer's guarantee

The manufacturer's guarantee operates for TEN YEARS following the date of purchase. In the unlikely event of Scale Doctor becoming unserviceable, i.e. the green lights fail to illuminate, send the unit back for replacement, quoting date of purchase and serial number. This guarantee does not extend to any other electrical or water appliance or device that may be in use by the user of Scale Doctor and we accept no liability for the malfunction of any device other than Scale Doctor which has, either directly or indirectly been sold to the user. Scale Doctor does not affect the potability or the natural mineral content of the water, as there is nothing in contact with the water. Therefore, we accept no responsibility for water quality. These guarantees shall only remain valid provided that the product is used for the precise purpose that it was designed and manufactured and provided that it is installed and in strict accordance with the appropriate instructions.

You only pay for shipping.

## GENERAL WARNINGS

- Do not immerse in water.
- Removing the back plate will void the Warranty and Performance Guarantee.
- Scale Doctor treated water reverts to its original state after 48 hours. This means that the water sitting in your water heater for several days will tend to behave as untreated water causing those nasty hard water stains. After the existing water has been replaced by freshly treated water, the anti-scaling effects of Scale Doctor will be noticeable again. If you plan to keep taking frequent long periods of absence, not using your hot water, we recommend installing a supplemental treatment unit on the outlet of the water heater.
- Do not dismantle your existing water softener before you are fully satisfied.
- Do not install in direct sun light.

# Scale Doctor

*For indoor use only*

## **YOUR BOX CONTAINS:**

- Scale Doctor energizing unit
- UL approved AC/DC switching power supply
- One core signal cable of sufficient length
- Six cable ties
- Four screw with wall anchors
- Instruction manual.

## **MOUNTING THE CONTROL BOX**

Use the four screws and if necessary the wall anchors to mount the control box to the wall. A screwdriver and a drill are needed. You can mount the unit horizontal or vertical. The unit can be mounted on any convenient surface and it can be installed at any angle, above or below the coil. Distance between voltage converter and coil should be at least 6" /15 cm.

## **PUTTING THE SCALE DOCTOR INTO OPERATION**

Insert the 12VDC plug of the voltage converter into the power jack at the side of the Scale Doctor and connect the voltage converter to either 110 V AC or 220 V AC.

## **BARGRAPH INDICATOR**

### **Signal cable not connected**

The two bottom LEDs of the bar graph show, indicating power present. The two LEDs above flash, indicating the software in the microprocessor is running. All other LEDs are off.

### **Signal cable connected**

The two bottom LEDs are on and the remainder of the bar graph flashes in a continuous up and down motion, indicating correct signal being generated.

## **TROUBLESHOOTING**

### **All LED'S fail to light up**

Check the voltage converter. Measure the output voltage on the plug with a multi meter set for a range of 20VDC. This voltage should be at least 12 V. If there is no voltage, check the mains voltage at the mains outlet on the wall with the multi meter set at 250 VAC. If normal, inform your supplier and obtain a new original voltage converter.

### **Only the two bottom LEDs show**

Unplug the unit, wait a few seconds and plug back in. (This reboots the system). If the problem persists, inform your supplier and request for a replacement.

# Scale Doctor

## WARNINGS

- Should your voltage converter become defective replace only with an identical converter available under warranty replacement from Scale Doctor.
- Do not shorten the power cords of the voltage converter. This will void the Warranty and the Performance Guarantee.
- Do not bypass the voltage converter.

## TECHNICAL SPECIFICATIONS

Supply voltage	110 – 240 V AC, $\pm 10\%$ , 50/60 Hz
Power	8 Watt
Power supply	External voltage converter
Coil cable	18 AWG/1 mm <sup>2</sup> stranded
Maximum Coil Temperature	176 °F/80 °C
Capable of driving	2 coils double stacked or in series
Output Reading	Bar graph
Enclosure material	ABS, Grey
Maximum ambient temperature	140 oF /60 oC
Minimum ambient temperature	14 oF/-10 oC
Enclosure material	ABS, Grey
Protection rate	NEMA2/IP54
Dimension unpacked (LxWxH)	9"x6"x1.5"/ 229x152x38 mm <sup>3</sup>
Dimension packed (LxWxH)	14"x8"x3"/ 356x203x76 mm <sup>3</sup>
Weight unpacked	1 lbs/0.45 kg
Weight packed	3 lbs/1.4 kg