

TROUBLESHOOTING THE WATER PURITY MONITOR Some Frequently Asked Questions

- Q: Does monitor read "good" or "bad" when it is unplugged?
A: The monitor reads "bad-RED" when it is unplugged.
- Q: What if the light switches between GREEN and RED between successive depressions of the "push-to-test" water purity monitor?
A: Do not press the "push-to-test" button rapidly in quick succession. Wait at least 1 minute between two successive depressions of the button for an accurate reading.
- Q: How should the probe be mounted for an accurate reading?
A: The probe should be mounted VERTICALLY, at the bottom of the T.
- Q: How long does the battery last?
A: approx 1 year
- Q: How do you determine if the battery needs replacement?
A: Depressing "push-to-test" button does not give any light.
- Q: If the monitor shows a red light, what does it mean?
A: It means that either the membrane is bad OR either the probe or monitor is faulty.
- Q: How do you determine if the probe or monitor is faulty?
A: Follow this procedure:
1. Put the #8 switch in the ON position. All other switches must be OFF.
 2. Dry out the probe and suspend it in mid-air.
 3. Depress the push-to-test button.
3A. If the GREEN light is ON, immerse the probe in tap water.
Depress the push-to-test button.
If the GREEN light is ON, you have a bad monitor and/or bad probe.
If the RED light is ON, you have a bad cartridge and/or bad membrane.
 - 3B. If the RED light is ON, unplug the probe from the jack (Fig. D).
Depress the spring contact on that jack with a pencil tip so that it is no longer touching the main body of the jack. Depress the push-to-test button.
If the GREEN light is ON, you have a bad probe.
If the RED light is ON, you have a bad monitor and/or bad probe.
4. Be sure to restore the monitor to the #7 switch ON and all others OFF.

IMPORTANT NOTE: ONLY USE ALKALINE BATTERIES.
Other Batteries will cause erroneous readings

The Ultimate™ DI System

Reverse Osmosis / Ion Exchange Water Purification System

(Addition to an existing RO System)



INSTALLATION AND OPERATING MANUAL

REV 07-13-2006

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DEIONIZATION CARTRIDGES #3 and #4 REPLACEMENT

The third and fourth stages are dual layer cation/anion cartridges, or in some cases a mixed bed DI. The condition of these cartridges should be judged by observing either a RED or GREEN light indication from the monitor. Please note that the probe is located between stages #3 and #4. Thus, the monitor indicates the condition of the third stage cartridge, only.

Turn the on the system and allow water to flow past the monitor probe for at least 20 minutes before attempting to use the monitor. The monitor will indicate GREEN when the cartridge is in good condition and RED if it is exhausted and in need of replacement. (Be sure that switch #7 is in the ON position and all other switches are OFF.)

Replace the third stage cartridge **immediately** if the RED light is on.

Note: In addition to the monitor indicating the DI cartridge condition, the resin will also change color. Note that only the DI-AR-CI-10 cartridge is color indicating, not the lab grade mixed bed cartridge that is sometimes used.

The DI-AR-CI-10 cartridge's violet-colored layer is the resin layer used to indicate exhaustion and will change to an orange color when exhausted. The standard cartridge will change color from bottom to top while the "down-flow" version will change from top to bottom.

The color change that occurs in this stage gives a general indication of its condition but the monitor will provide the most accurate diagnosis of its condition. There may be local conditions that affect the color-changing characteristics of these DI cartridges. High pH water may prevent these cartridges from changing colors.

Materials Needed: One DI-AR-CI-10 Deionization cartridge, filter wrench.

Procedure:

1. Remove the filter housing from Stage #3 by unscrewing it counterclockwise as viewed from the bottom.
2. Remove and discard the old cartridge from the housing.
3. Remove the housing and cartridge from Stage #4 and re-install the cartridge in Stage #3. Make sure the cartridge is installed in the correct direction as marked on the filter housing and that the **top seal** is securely attached to the top of the cartridge.
4. Install a new cartridge (DI-AR-CI-10) into Stage #4. Re-install the bottom housings onto the caps by rotating them clock-wise and hand tighten ONLY.
5. If no other service is required, turn the system on and check for leaks.

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DEIONIZATION CARTRIDGES #1 and #2 REPLACEMENT

In order to determine the condition of stages #1 and #2, watch for the color to change from the bottom to the top. The color will change from a very dark blue to a lighter blue or tan color. Once cartridge #1 has changed color by 70 to 80% it **must** be replaced in accordance with the following instructions. (For "down flow" DI systems or systems that incorporate a permeate pump, the color will change from the top to the bottom). There may be local conditions that affect the color-changing characteristics of these DI cartridges. High pH water (due to soda lime softening) may prevent these cartridges from changing colors.

Materials Needed: One DI-SFCC-10 Deionization cartridge, filter wrench.

Procedure:

1. Remove the filter housing from Stage #1 by unscrewing it counter clockwise as viewed from the bottom.
2. Remove and discard the old cartridge from the housing.
3. Remove the housing and cartridge from Stage #2 and re-install the cartridge in Stage #1. Make sure the cartridge is installed in the correct direction as marked on the filter housing and that the top seal is securely attached to the top of the cartridge.
4. Install a new cartridge (DI-SF-CI-10) into Stage #2. Re-install the bottom housings onto the caps by rotating them clockwise and hand tighten ONLY.
5. If Stage #3 requires service, proceed to the instructions on page 9. If no other service is required, turn the system on and check for leaks.

Replacement Parts

Model	Replacement Part
(2) DI-SF-CI-10	SilicaFree™ Color Change DI Cartridge
(2) DI-AR-CI-10	Chloramine Removal Cartridge
(2) DI-MB-10	Mixed-Bed Cartridge for Laboratory Use
XWR-UNIV	Filter Wrench (ONLY USE TO UNSCREW HOUSING)

TERMS AND CONDITIONS OF SALE

1. Shipping charges on units or parts submitted to our facility for repair or replacement must be borne by the registered purchaser. After repair or replacement, the factory will return the unit or part freight prepaid to the customer.
2. We assume no warranty liability in connection with our equipment other than as herein specified.
3. This warranty is in lieu of all other warranties expressed or implied, including warranties of fitness for a particular purpose.
4. We do not authorize any person or representative to assume for us any other obligation on the sale of our equipment. This is the exclusive remedy and liability for consequential damages under any and all warranties which are excluded to the extent exclusion is permitted by law.
5. Proof of original purchase date must accompany all warranty claims.
6. SpectraPure, Inc. reserves the right to change prices without notice when necessary. All prices in the catalog are quoted in US dollars.
7. Claims for error in quantity or condition must be made within 10 days of receipt of material. SpectraPure, Inc. will not be responsible for any claimed shortages not reported within 10 days. Returns other than warranty claims may be subject to 20% restocking fee.
8. SpectraPure, Inc. cannot be held liable for damage or loss to a shipment by a freight carrier. Check shipment for damage before acceptance or note on freight bill subject to inspection for concealed damage. Consignee must file claim. SpectraPure, Inc. will offer as much assistance as possible.
9. A complete credit check is required prior to shipping on a Net 30 or "C.O.D. - CUSTOMER CHECK ACCEPTABLE" basis. In the interim period during which credit references are being evaluated, all orders must be shipped "C.O.D. - CERTIFIED FUNDS" (cash, cashier's check or money order).
10. All returned checks (due to insufficient funds or closed accounts) will be subjected to a **\$25 penalty charge**.

Invoices on Net 30 accounts not paid within 30 days of shipment will be considered delinquent and will accrue Finance charges at the rate of 1.5% per month (18% per annum).

THREE YEAR LIMITED WARRANTY

Effective on products purchased after March 10, 2005.

SpectraPure, Inc.® warrants the product to the original owner only to be free of defects in material and workmanship for a period of three years from the date of receipt. SpectraPure's liability under this warranty shall be limited to repairing or replacing at SpectraPure's option, without charge, F.O.B. SpectraPure's factory, any product of SpectraPure's manufacture. SpectraPure will not be liable for any cost of removal, installation, transportation or any other charges which may arise in connection with a warranty claim. Products which are sold but not manufactured by SpectraPure are subject to the warranty provided by the manufacturer of said products and not by SpectraPure's warranty. SpectraPure will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair or, if the product was not installed in accordance with SpectraPure's or other manufacturer's printed installation and operating conditions, or damage caused by hot water, freezing, flood, fire or acts of God.

SpectraPure will not be responsible for any consequential damages arising from installation or use of the product, including any water or mold damage due to flooding which may occur due to malfunction or faulty installation, including, but not limited to failure by installer to over- or under-tighten fittings, housings, and/or push-style fittings, or improper installation of push-style fittings. Consumable items such as pre filters and membranes are not covered under the three year warranty.

SpectraPure warrants (pro-rated) the performance of tested SpectraSelect™ RO membrane elements only, for one year from date of receipt by the buyer, providing that the loss of performance was not caused by fouling, neglect or water conditions exceeding the feed water parameters listed in the applicable product manual (refer to detailed membrane warranty information). SpectraPure will, on confirmation of loss of performance during the warranty period, credit the pro-rated amount of the current catalog price of the element. The disposable filters and cartridges are not covered under the warranty.

To obtain service under this warranty, the defective system or components must be returned to SpectraPure with proof of purchase, installation date, failure date and supporting installation data. Any defective product to be returned to the factory must be sent freight prepaid; documentation supporting the warranty claim and a Return Goods Authorization (RGA) number must be included. SpectraPure will not be liable for shipping damages due to the improper packaging of the returned equipment and all returned goods must also have adequate insurance coverage and a tracking number.

SpectraPure will not pay for loss or damage caused directly or indirectly by the presence, growth, proliferation, spread or any activity of "fungus", wet or dry rot or bacteria. Such loss or damage is excluded regardless of any other cause or event that contributes concurrently or in any sequence to the loss. We will not pay for loss or damage caused by or resulting from continuous or repeated seepage or leakage of water, or the presence or condensation of humidity, moisture or vapor, that occurs over a period of 14 days or more. "Fungus" and "fungi" mean any type or form of fungus or Mycota or any by-product or type of infestation produced by such fungus or Mycota, including but not limited to, mold, mildew, mycotoxins, spores, scents or any biogenic aerosols.

SpectraPure will not be liable for any incidental or consequential damages, losses or expenses arising from installation, use, or any other causes. There are no expressed or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

*** The three year limited warranty does not apply to consumable items, including but not limited to, filters and cartridges unless specifically stated above**

SYSTEM HOOK-UP

1. Before connecting The Ultimate DI to any Reverse Osmosis water source, check for the following conditions:
 - A. The Ultimate is designed to be used on RO water sources.
It is not intended to function as a tap water DI system.
 - B. Check the RO membrane rejection rate. Refer to your RO System manual for rejection rate calculations. The minimum rejection rate recommended for use with The Ultimate is 95%. For optimum performance, the rejection rate should be >97%. The longevity of the de-ionizing cartridges are directly related to the input water conductivity, pH, and chemistry.
 - C. Check the waste to product water ratio of the RO System. For line-pressure RO Systems, a 4:1 or greater ratio is recommended.
 - D. The flow rate from the RO System should be no greater than 1 gallon/min.
 - E. Water temperature should be less than 110 F.
2. If you are connecting The Ultimate to a new RO System or have installed a new RO Membrane in an existing system, allow the RO System to produce water for at least 2 hours before connecting it to The Ultimate.
3. Attach the product line from your RO System into the (left) input fitting on The Ultimate.
4. Attach the blue DI output water tubing into the (right) output fitting on The Ultimate. This is the Final Product output. Do not restrict flow in these lines.

OPERATION

1. Slowly open the cold water supply valve to the RO System and allow the DI housings to fill. You may use pressure up to 80 psi (5.5 bar). Discard at least 2 gallons of water before using the system or make sure the monitor's green light is on when the red button is pressed.
2. Initially, air trapped in the DI cartridges is a normal condition and will not affect the operation of the DI cartridges.

USING THE PURITY MONITOR (EPM)

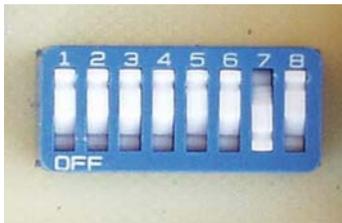
The purity monitor is typically used to monitor the condition of the DI cartridge, and with a simple procedure, monitor the RO membrane.

1. Before operating the monitor, allow at least 2 gallons of water to run through the system.
2. To test, press the red "push-to-test" button located on the front of the monitor box. At any point, a green or "good" indication means lower electrical conductivity (pure water), while a red or "service" indication means higher conductivity (less pure water). A red or "service" indication would normally imply that membrane replacement and/or deionization cartridge replacement is required.
3. If neither indicator illuminates, replace the battery with the 9 volt ALKALINE type ONLY.

Warning!!: The water purity monitor does not detect the presence of silica, organic contaminants or micro-organisms, nor should it be used as a medical or scientific instrument. It should be used as an indicator or guide only, and does not imply water safe for human consumption. No application other than monitoring the electrical conductivity of water is expressed or implied.

Switch Number	1	2	3	4	5	6	7	8
Setting in uS	100	50	20	10	5	2	1	0.5
Setting in ppm	67	33	13	6.7	3.3	1.3	0.67	0.33

Fig. B: Purity Monitor Switches

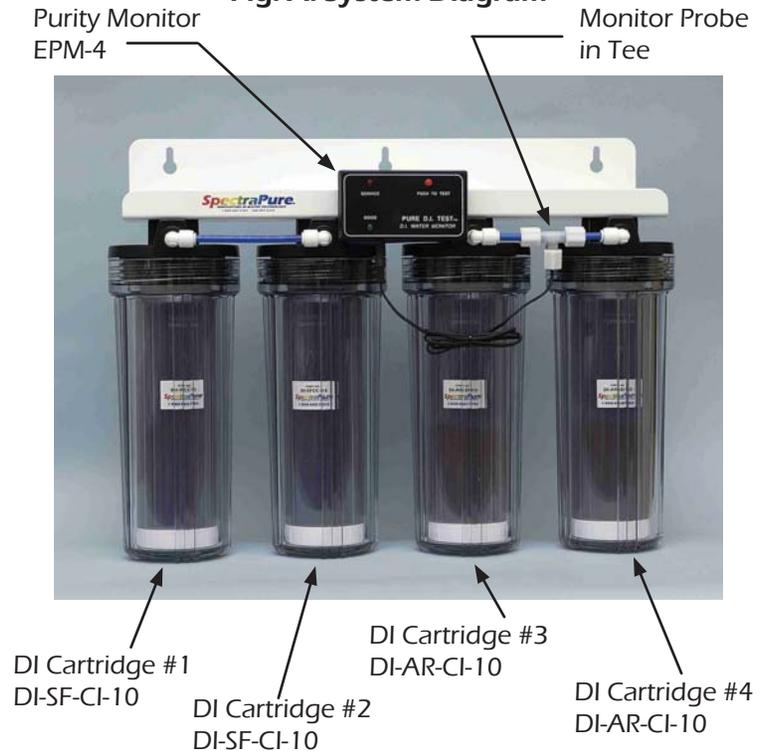


* If settings are changed for any reason (such as testing the quality of the RO membrane), They should be returned to the original #7 setting after completion of the test.

SYSTEM SPECIFICATIONS

1st Stage Cartridge	SilicaFree™ Color Change DI Cartridge
2nd Stage Cartridge	Back-up SilicaFree™ Color Change DI Cartridge
3rd Stage Cartridge	Chloramine Removal Cartridge
4th Stage Cartridge	Back-up Chloramine Removal Cartridge

Fig. A: System Diagram



SpectraPure®Inc. assumes no responsibility for water damage due to leaks. It is the user's responsibility to determine that the system is leak-free.

SYSTEM DESCRIPTION

SpectraPure's new Four-Stage Deionizing System, The Ultimate™ is optimized for use with RO water and provides the most complete removal of silica, colloidal silica, phosphates, nitrates, and heavy metals available.

The Ultimate™ eliminates contaminant leakage from exhausted DI cartridges with the addition of secondary back-up cartridges. An exhausted deionization cartridge will leach the removed impurities back into the water at levels many times higher than originally found in the source water. The addition of the two secondary DI stages prevents this leakage.

When the first SilicaFree Cartridge (DI-SFCC-10) changes color upon exhaustion, it is removed and the Stage 2 back-up cartridge is rotated to the first position and a new cartridge replaces the second-stage cartridge.

With this configuration, the possibility of contaminated product water due to exhausted cartridges is completely eliminated. With the majority of contaminants now removed by Stages #1 and #2, the water is then passed through two additional stages of DI resin. Stages #3 and #4 have our Chloramine Removal Cartridges (DI-AR-CI-10). They will provide longer life than standard mixed-bed cartridges, when used to treat water containing chlorine, chloramine and ammonia. These two additional stages of purification polish the water, adjust the pH to neutral, and remove any remaining contaminants to achieve greater than 18 megohm purity.

An electronic purity monitor has been included in order to provide accurate monitoring of the condition of stage #3. Stage #4 acts as a backup cartridge, which ensures that, if Stage #3 becomes exhausted, no contamination of the product water will result.

Stages #3 and #4 utilize the same scheme of rotating cartridges. These cartridges will also change color. With this superior configuration, you can count on the best quality water possible, combined with the longest cartridge life available.

The Ultimate™ is also available as a system optimized for laboratory water sources. This model has all the advantages of the standard Ultimate™ System, except Stages #3 and #4 are configured with our Semi-Conductor Grade Mixed-Bed Cartridges (DI-MB-10).

Any existing RO or RO/DI System can be converted to The Ultimate™. Contact the factory for further details.

INSTALLING THE WATER PURITY MONITOR

1. Remove front cover from the monitor and connect the supplied 9-volt battery to the snap terminals located on the circuit board (Fig. C). Support the battery terminals with your finger while inserting the battery. For proper operation use only an ALKALINE type battery.
2. Insert the plug from the test probe cable into the jack on the monitor box.
3. Locate the 8-position "dip switch" (Fig. B). Each of the internal settings corresponds to a specific electrical conductivity level measured in micro-siemens (uS). The equivalent natural water" TDS setting in ppm is shown below.
4. Locate switch #7 on the selector switch. Slide (or push-in) the switch to the ON position. Ensure that all remaining switches are in the OFF position. This is the recommended setting to determine the condition of the #2 cartridge.
5. Replace the front cover and fasten with the included screw. Locate monitor at an easily accessible location within 3 feet of the test probe. Attach by peeling the protective cover from the self-adhesive velcro tape and pressing onto the mounting surface.

Fig. C: Purity Monitor Without Cover

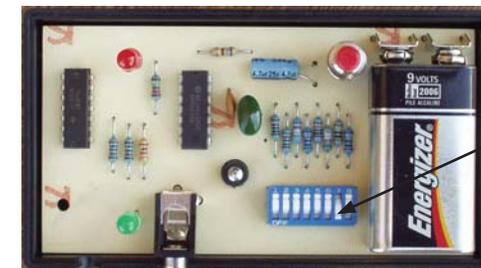


Fig. D: Purity Monitor Jack

