



PHIX[®] Owners Manual

Acid Neutralization Systems



Congratulations!

You now have the most efficient and innovative wastewater neutralization system. The PHIX Cartridge System, manufactured by Zurn, is a point-source acidic wastewater treatment solution complying with local plumbing codes throughout North America. Your engineered system protects your building's plumbing piping and the local sanitary sewer infrastructure from corrosive acids.

Now, you have a safe, easy and worry-free neutralization solution treating low pH where it starts – at the sink.

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1) PHIX Cartridge Overview

1.1 The PHIX Advantage

Traditional wastewater neutralization relies on old, ineffective and often toxic and hazardous technologies to treat acidic wastewater. PHIX technology represents the next generation in point-source/in-line wastewater neutralization and can be used in various applications requiring pH adjustment in the treatment process, to ensure effluents meet by-law regulations.

PHIX neutralization systems are point-source wastewater neutralization technologies that treat acidic wastewater safely and effectively in process and/or prior to discharge into a municipal sewer system. The advanced neutralization systems are adaptable, use simple designs and straightforward techniques to adjust pH efficiently to within discharge limits, preventing sewer surcharges or fines.

1.2 PHIX Cartridge Design

The PHIX Cartridge System, designed for direct installation under the sink, treats acidic wastewater at the source. The PHIX Cartridge System is compatible with various sink sizes, and is easy to install in most commercial, institutional and industrial applications.

The PHIX Cartridge System features an engineered flow-through design to maximize efficiency and minimize maintenance. The Cartridge uses all natural and safe to handle PHIX Media which permits better control over effluent pH. PHIX Media requires no special storage or handling and ensures optimal and neutralization treatment within the space-saving unit.

The PHIX Cartridge reduces the cost of all new construction projects by eliminating the need for glass, glass lined or PVDF piping. For retrofit projects, the PHIX Cartridge fits directly underneath the sink removing the need for a collection tank to treat and store acidic wastewater prior to discharge into the sewer system.

1.2.1 PHIX Media and Performance

The PHIX Cartridge uses PHIX Media, a mix of solid alkali non-resin materials, to neutralize acidic wastewater. It is used throughout the neutralization process and is replaced as required. It permits better control over effluent pH and eliminates the need for special storage or handling required by traditional hazardous neutralizing chemicals. PHIX Media has several formulations. To ensure the correct Media formulation is used, Zurn works with its clients to analyze the specific wastewater inputs and requirements for each application.

For acid neutralization applications, PHIX Media replaces the regular use of marble or limestone. PHIX Media is a cost-effective treatment that ensures continuous wastewater neutralization and by-law regulations compliance.

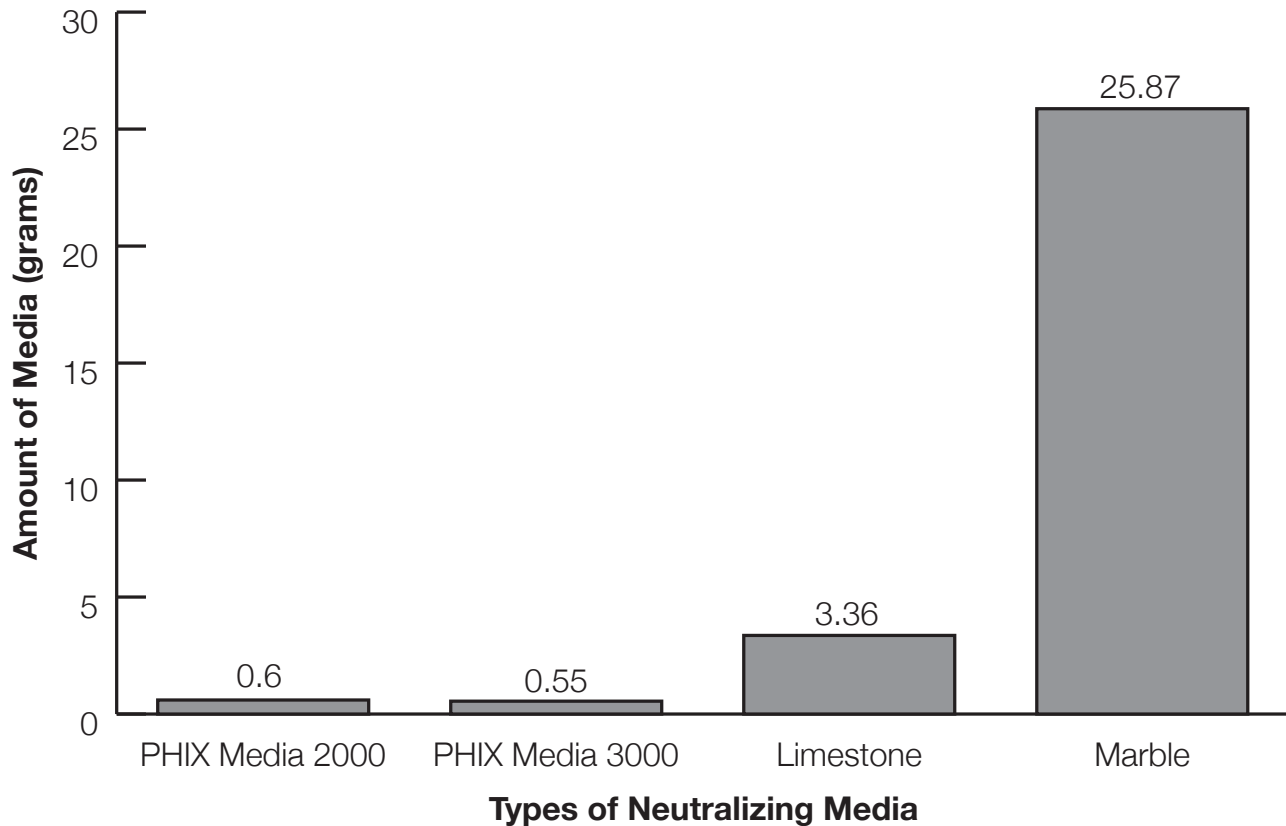
Performance testing evaluated the treatment efficiency of PHIX Media in the PHIX Cartridge System. A standard neutralizing capacity test was used to compare the ability of specific neutralizing chemicals to adjust the pH of a sample to within acceptable by-law levels.

Standard concentrations of hydrochloric acid (HCl samples were ran through a series of titrations until the required by-law pH levels were attained. Once the testing stage was complete, usage rates were used to calculate the total amount of media required to neutralize the samples. Figure 1.1 illustrates the results of neutralizing capacity test of the PHIX Cartridge System and the effectiveness of PHIX Media.

1.3 Applications

The PHIX Cartridge System may be used in numerous non-residential pH adjustment applications including:

- Laboratory sinks
- School laboratory benches
- Hospital laboratories
- Maintenance sinks
- Commercial rinse sinks

Figure 1.1 PHIX Media Required to Neutralize 1 g (0.03 oz.) of HCl

PHIX Media is five times more efficient than limestone and 43 times more efficient than marble chips.

PHIX Media vs. Traditional Acid Neutralization Chemicals

	PHIX MEDIA	LIMESTONE	CAUSTIC SODA
Safety	Contact with skin rarely causes irritation.	Hazardous to handle.	Extremely hazardous to handle.
Environmental Effects	Harmless with no by-products.	Highly caustic and can cause immediate damage to the environment.	Highly corrosive causing severe physical injury to plant and animal life coming in contact with it.
Ease of Handling	No special handling or equipment required.	Expensive solids and handling equipment is required.	Requires elaborate safety equipment and rigorous, time-consuming safety procedures.
Equipment Costs	No initial capital cost.	Initial capital cost required. Expensive and regular maintenance required due to the abrasiveness of lime.	Expensive capital and maintenance costs. Regular maintenance, heated system and safety equipment required.
Application	Flow through system.	Conventional batch treatment system.	Conventional batch treatment system.

For more information on PHIX Media, please contact a Zurn Customer Care Representative at 1-855-ONE-ZURN or visit www.Zurn.com.

1.4 PHIX Cartridge Design Considerations

1. The PHIX Cartridge System treats acidic wastewater only.
2. The PHIX Cartridge System is designed for under the sink installations.
3. The PHIX Cartridge System cannot intercept solids, fats, oils or grease from the wastewater. An interceptor is recommended for solids, oil and grease. For more information on interceptors, please visit www.Zurn.com or contact a Zurn Customer Care Representative at 1-855-ONE-ZURN.

1.5 PHIX Cartridge Parts and Components

The PHIX Cartridge System is constructed from fiberglass reinforced polypropylene and schedule 80 PP pipe. The material of construction has a high resistance to numerous chemicals.

The PHIX Cartridge System comes in one size. It is shipped pre-assembled and includes a bucket, supporting bracket and two prescribed packages of PHIX Media.

The PHIX Cartridge System design has three (3) main components: 1) Top Manifold; 2) Internal Skeleton; and 3) Cartridge Body. See Figure 1.2.

The PHIX Cartridge System attaches easily to the underside of a sink. Wastewater from the sink flows down through the center column. Solids settle to the bottom of the cartridge body. The wastewater then flows back up through the treatment chamber and is treated by the PHIX Media. Neutralization of the acidic wastewater occurs upon contact with the PHIX Media. The treated wastewater then exits the unit through the outlet on the side of the top manifold.

NOTE: Any modifications to the unit will alter the ability of the System to effectively treat wastewater.

1.5.1 Top Manifold

The Top manifold of the cartridge houses the unit's three main connections (Figure 1.3):

- A) Threads to the sink drain;
- B) Connection to the drain pipe; and
- C) Threads into the Body of the PHIX Cartridge.

1.5.2 Internal Skeleton and Cartridge Body

The Internal Skeleton directs the flow of the wastewater through the system, and facilitates contact with the PHIX Media whereby the acidic wastewater is neutralized prior to discharge. The Cartridge body makes up the treatment chamber. The parts and components operate as follows (Figure 1.4):

1. The filter plates and filter help to contain the PHIX Media in the treatment chamber. The PHIX Media sits in the treatment chamber just above the media filter plate.
2. The center column inserts into the cartridge body and channels wastewater from the sink and to the bottom of the cartridge body. The zone below the media filter plate allows for any fine PHIX Media particles to settle out
3. Wastewater flows up from the bottom and through perforated Media filter plate to the treatment chamber where it comes into contact with PHIX Media.
4. The neutralized wastewater flows through the filter which retains the PHIX Media inside the PHIX Cartridge. The top and bottom filter plates support the filter in place.
5. The treated wastewater exits the unit through the top manifold and into the drain pipe.

The PHIX Cartridge System is available in one standard design to neutralize acidic wastewater. Each unit is configured for standard North American sink drain down times.

Figure 1.2 PHIX Cartridge System Parts and Components

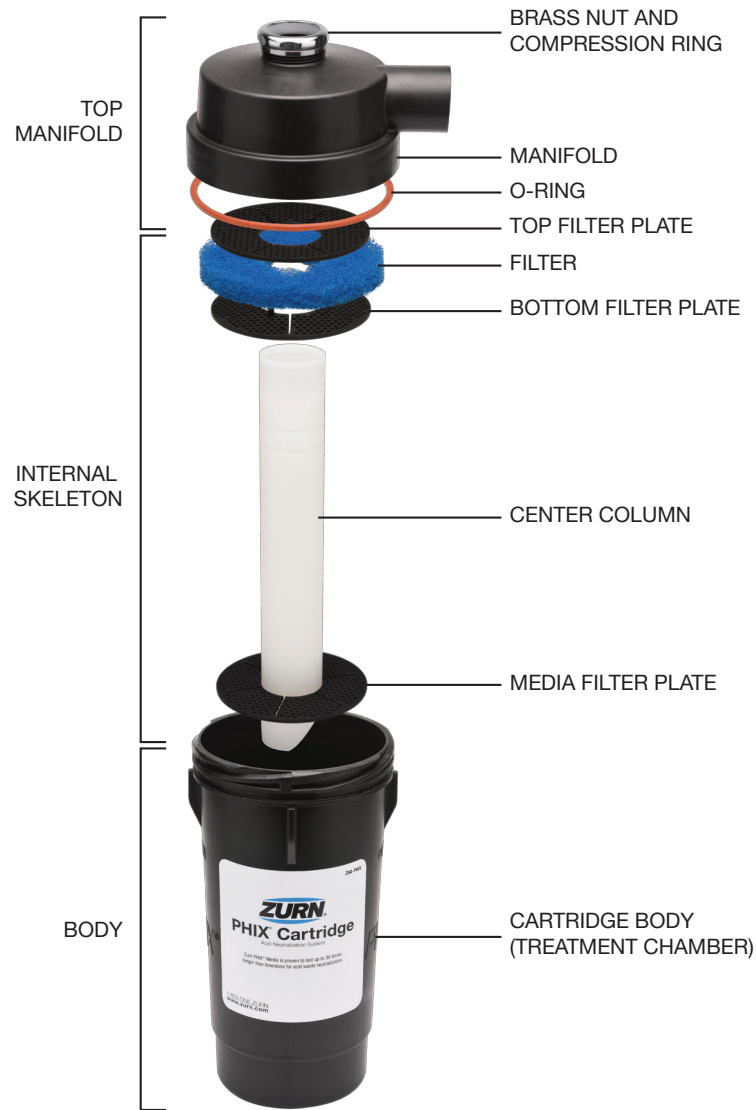


Figure 1.3 Top Manifold

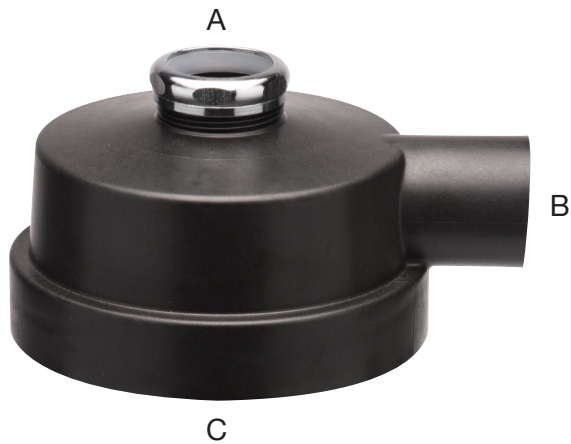


Figure 1.4 Cartridge Cross Section and Flow Pattern



2) Step-by-Step Installation Procedures

The PHIX Cartridge System is shipped pre-assembled and includes a bucket, siphon, hose, support bracket, and two prescribed packages of PHIX Media. To install the unit, please follow these simple step-by-step installation instructions.

A) Remove Drain

Remove the existing waste (drain) pipe between the sink strainer and the stub out at the wall or floor. If the piping is plastic with compression (threaded-type) fittings, unthread the pipe and save it for possible reuse. If the pipe is welded or metal, cut using a hacksaw and discard. Unscrew fittings by hand or with groove-joint pliers.

Installation Tip: Before removing the drain plug or disconnecting the trap, place a plastic bucket under the drain trap to catch any standing water.

B) Add PHIX Media to the PHIX Cartridge System

The PHIX Cartridge System is shipped with two packs of media for initial charge and a refill. To ensure that acidic wastewater is properly neutralized, the cartridge must be loaded with the initial charge of media before it is installed.

To add PHIX Media to the PHIX Cartridge (Figure 2.1)

1. Unthread the cartridge top manifold from the body.
2. Remove the top filter plate, filter, and bottom filter plate from the center column. The filter plates snap fit onto the center column and are removable by hand.
3. Pour the PHIX Media into the cartridge body up to the fill line.
4. Re-install the bottom filter plate, filter, and top filter plate on the center column.
5. Re-thread the cartridge body to the cartridge top manifold. The cartridge is ready to be installed.

Figure 2.1 Filling PHIX Media in the Cartridge



C) Connect the PHIX Cartridge System

To connect the PHIX Cartridge System to the sink, slip the brass nut onto the tail piece and thread to the top of the cartridge (Figure 2.2). Use the provided plastic compression ring between the brass nut and the cartridge top to obtain a proper seal.

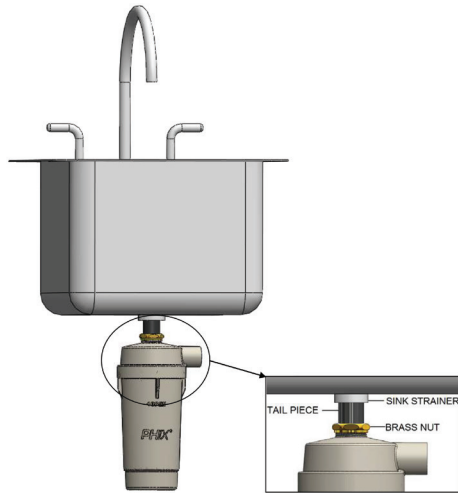


Figure 2.2 Connection between the PHIX Cartridge and Sink

D) Connect Plastic Waste Pipe

Connect a pipe between the outlet of the cartridge and the stub out (drain fitting). Options for connecting the outlet pipe are illustrated below. All piping from the PHIX Cartridge System must meet the local plumbing codes.

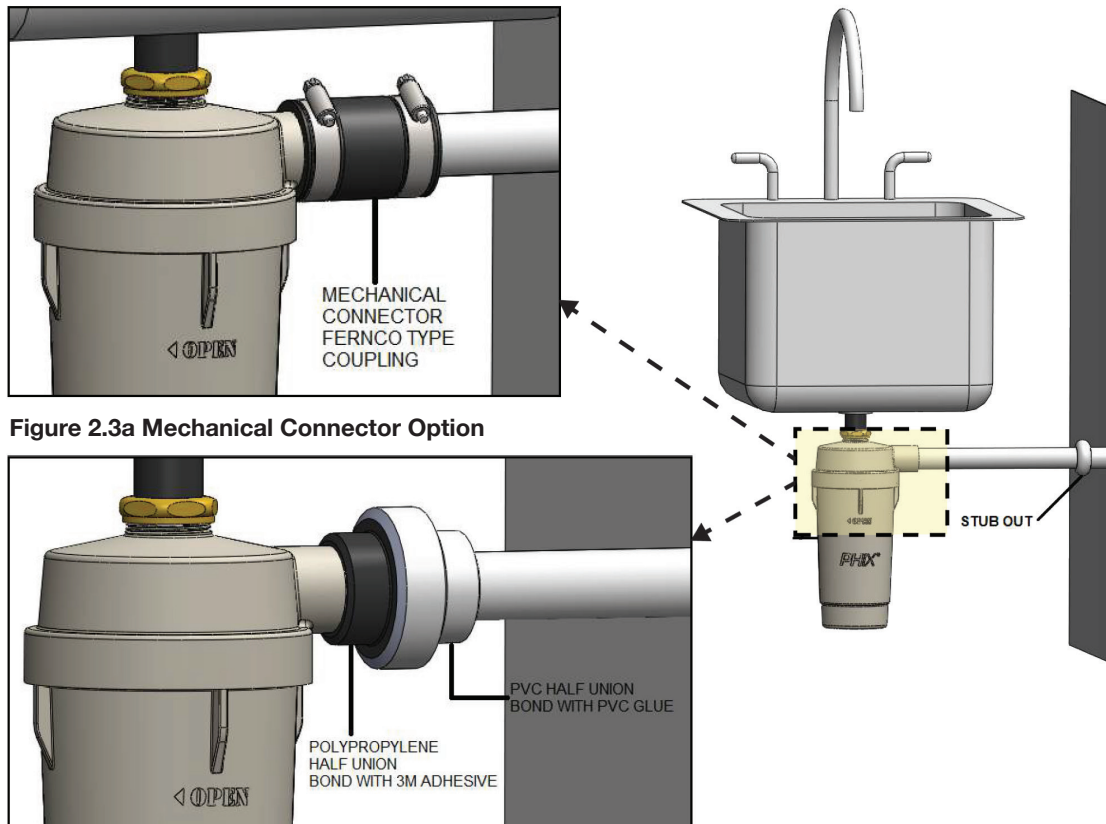


Figure 2.3a Mechanical Connector Option

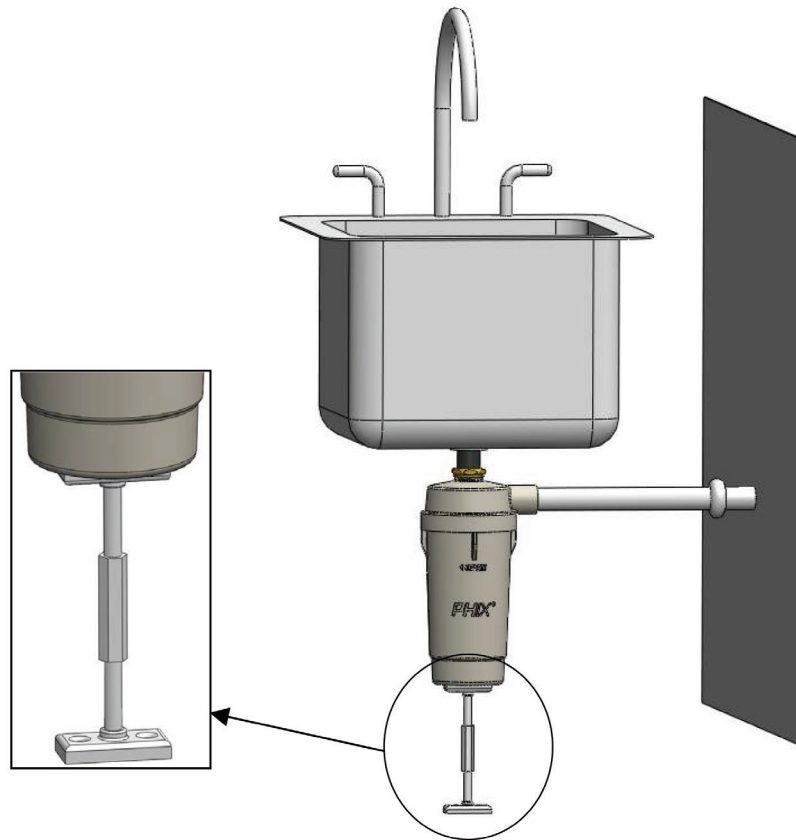
Figure 2.3b Unions Bonded with Adhesive Option (Use Construction Adhesive designed for low surface energy surfaces, such as 3M™Scotch-Weld™Structural Plastic Adhesive DP-8010)

E) Install Support Bracket

The installation of the support bracket ensures that the suspended PHIX Cartridge System is properly supported. The bracket is supplied completely assembled.

1. Place the bracket on the ground or cabinet floor directly below the bottom of the cartridge.
2. Adjust the height of the bracket such that the bottom of the cartridge is sitting firmly on the bracket.
3. Center the bracket underneath the cartridge.
4. Secure the bottom flange of the bracket with screw fasteners into the ground or cabinet floor (Figure 2.4).

Figure 2.4 Expanded view of the Support Bracket



F) Initial Startup Procedure

Once the installation is complete, you must perform a flow test to verify there are no leaks.

Flow test: Run water from tap into sink, and visually inspect threaded connections.

1. If a leak is detected tighten the threaded connections until the leak has stopped.
2. Once the leak test is passed the PHIX Cartridge System is ready for operation.

3) Maintenance of the PHIX Cartridge

The maintenance of the PHIX Cartridge System is critical to prevent disruption in the neutralization treatment process. The PHIX Cartridge System must be maintained according to the following procedures to ensure continual effective treatment of acidic wastewater.

3.1 Maintenance Inspection

Over time, the bottom of the cartridge collects spent PHIX Media. When the drain down time of the sink increases (i.e. the amount of time it takes to drain a sink is slower than usual), it indicates that the PHIX Cartridge requires cleaning due to a high accumulation of solid waste at the bottom of the cartridge.

3.2 Solids Removal

- Remove the support bracket to create adequate space to remove the cartridge body. Place a bucket (supplied with the PHIX Cartridge) under the cartridge (Figure 3.1). This will catch water that may leak from the cartridge body when it is unthreaded from the manifold.

Before proceeding: Wear rubber gloves to protect the skin from liquid contact.

- Unthread the cartridge body from the cartridge top manifold (Figure 3.2).
- Remove the top filter plate, the filter, and bottom filter plate from the cartridge body (Figure 3.3).
- Turn the cartridge at an angle and dump the liquid and PHIX Media into the bucket (Figure 3.4).
- Once the liquid and PHIX media is removed, pull the center column out (Figure 3.5).
- With all the components removed from the body, rinse out the bottom of the cartridge to remove any solids.
- Place the center column (with the media filter plate in place) back into the cartridge body.
- Pour the media back into the cartridge or if the media is spent replace the media with new PHIX Media. Reattach the bottom filter plate, filter, and top filter plate.
- Re-thread the cartridge body to the manifold.
- Place the support bracket directly underneath the cartridge and adjust to secure it back into place such that it supports the PHIX Cartridge.
- Run water through the PHIX Cartridge to ensure no leaks are present.

Figure 3.1a FIRST Siphon the Liquid from the PHIX Cartridge

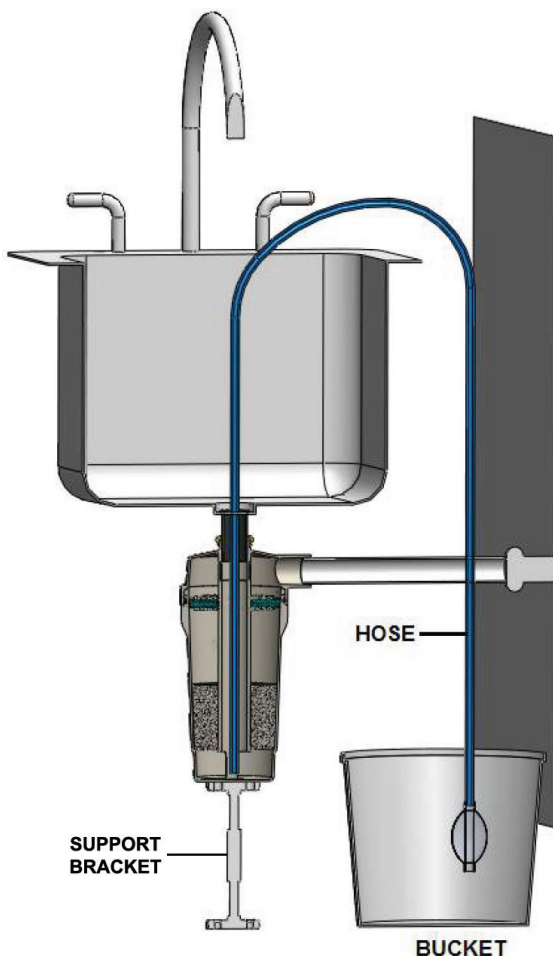


Figure 3.1b Unthread the PHIX Cartridge from the Manifold

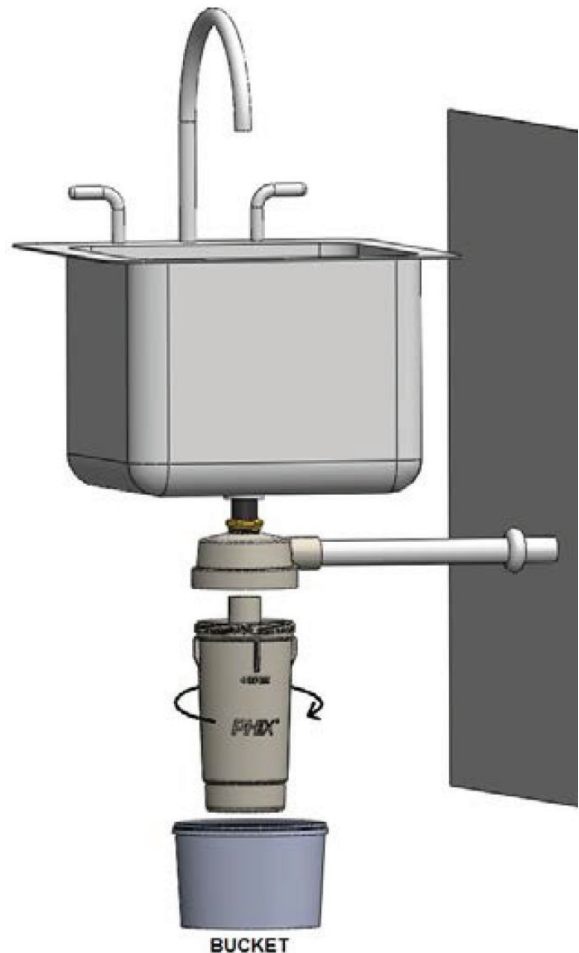


Figure 3.2 Remove Cartridge



Figure 3.3 Remove Filter Plates and Filter



Figure 3.4 Dispose of spent PHIX Media



Figure 3.5 Remove Center Column, Clean Cartridge and Re-assemble



3.3 Media Replacement

To ensure proper acid neutralization the PHIX Media in the PHIX Cartridge System must be monitored at regular intervals to determine replacement according to the following guidelines.

USAGE	MONITORING FREQUENCY
Constant use, highly acidic wastewater	Quarterly (every 3 months)
Moderate use, mixed acidic and basic wastewater	Biannually (twice a year)
Low use, mildly acidic wastewater	Annually (once a year)

To confirm the monitoring schedule for your application visit www.Zurn.com or contact a Zurn Customer Care Representative at 1-855-ONE-ZURN.

To replace PHIX Media, the procedure is similar to the maintenance (solids removal) procedure.

1. Remove the support bracket to create adequate space to remove the cartridge body.
2. Place a bucket (supplied with the PHIX Cartridge) under the cartridge. This will catch water that may leak from the cartridge body when it is unthreaded from the manifold.

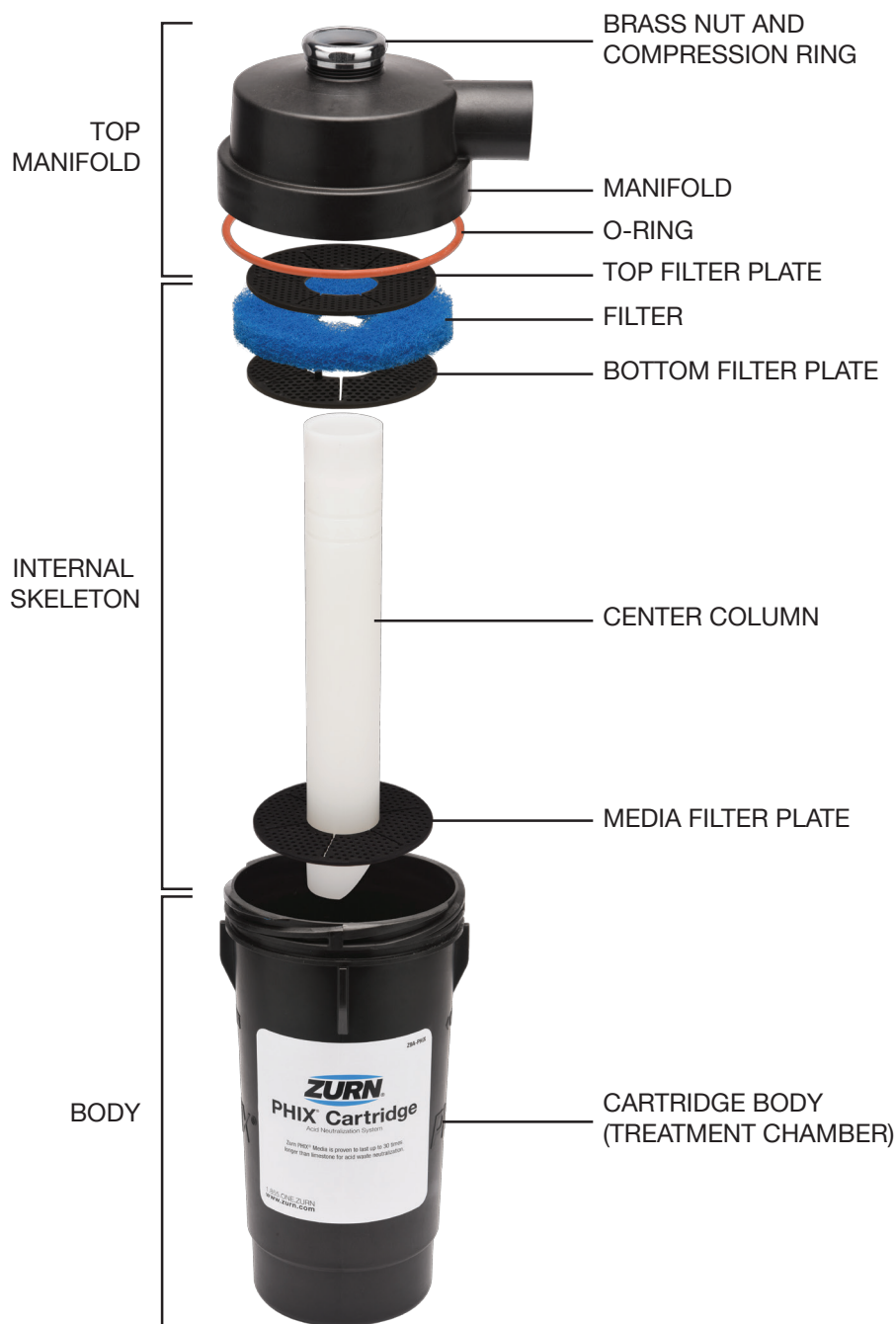
Before proceeding: Wear rubber gloves to protect the skin from liquid contact.

3. Unthread the cartridge body from the cartridge top manifold.
4. Drain the cartridge body of liquid in to the bucket for disposal.
5. Remove the top filter plate, the filter, and bottom filter plate from the cartridge body.
6. Turn the cartridge at an angle and dispose the spent PHIX media into a trash bin. No special handling of used PHIX media is required.
7. Once the PHIX media is removed, pull the center column out.
8. With all the components removed from the cartridge body, rinse out the bottom of the cartridge to remove any solids.
9. Clean the different components using water and a clean cloth.
10. Place the center column (with the media filter plate in place) back into the cartridge body.
11. A refill PHIX Media package is supplied free of charge with the PHIX Cartridge System. Pour the refill package of PHIX Media into the cartridge body and re-insert the bottom filter plate, filter, and top filter plate. 11a. If the refill is used and spent, replacement PHIX Media can be ordered through a Zurn Sales Representative . Using the measuring cup provided with the pail of PHIX media, pour one full cup of PHIX media into the cartridge up to the fill line.
12. Re-thread the cartridge body to the top manifold.
13. Place the support bracket directly underneath the cartridge and adjust to secure it back into place such that it supports the PHIX Cartridge.
14. Run water through the PHIX Cartridge to ensure no leaks are present.
15. The PHIX Cartridge System is ready to resume operation.

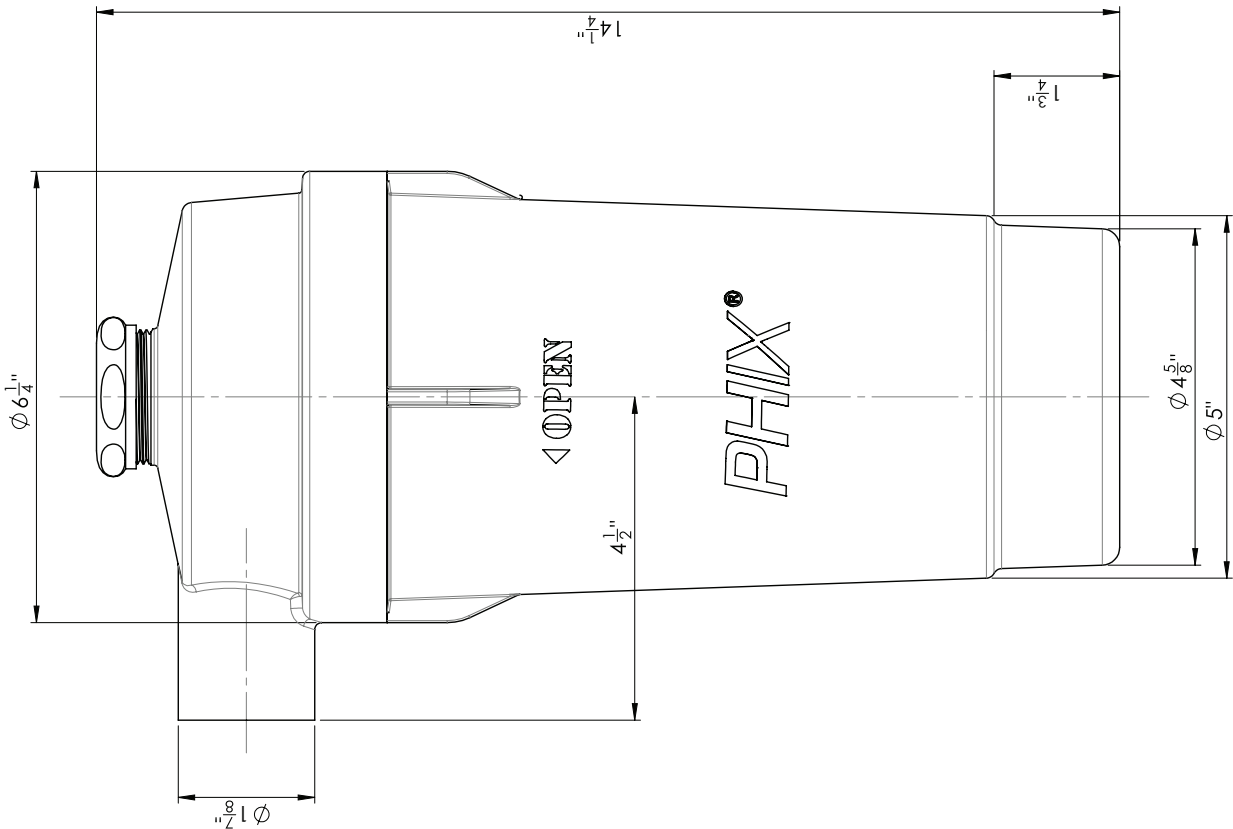
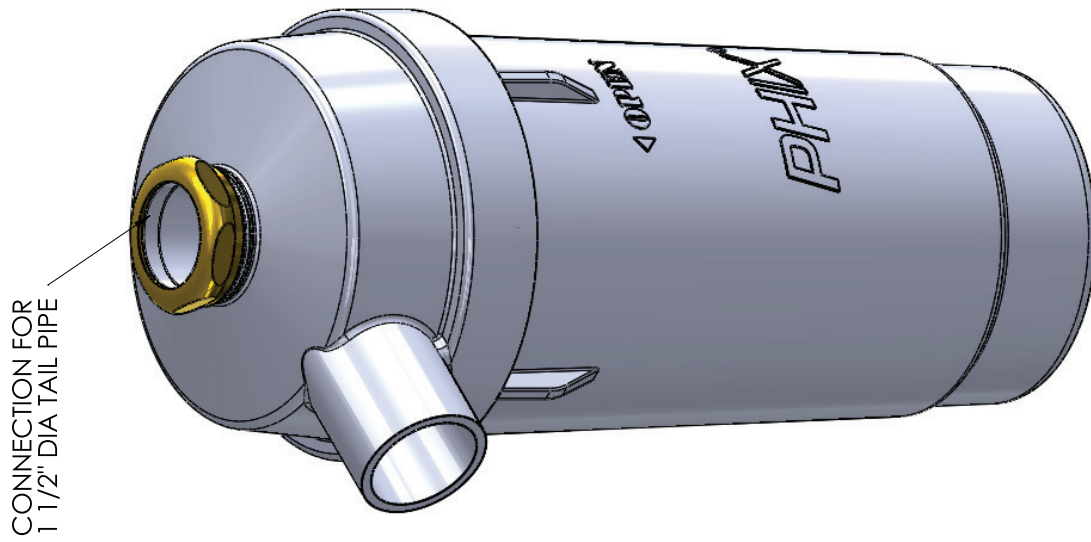
4) PHIX Cartridge System Replacement Parts

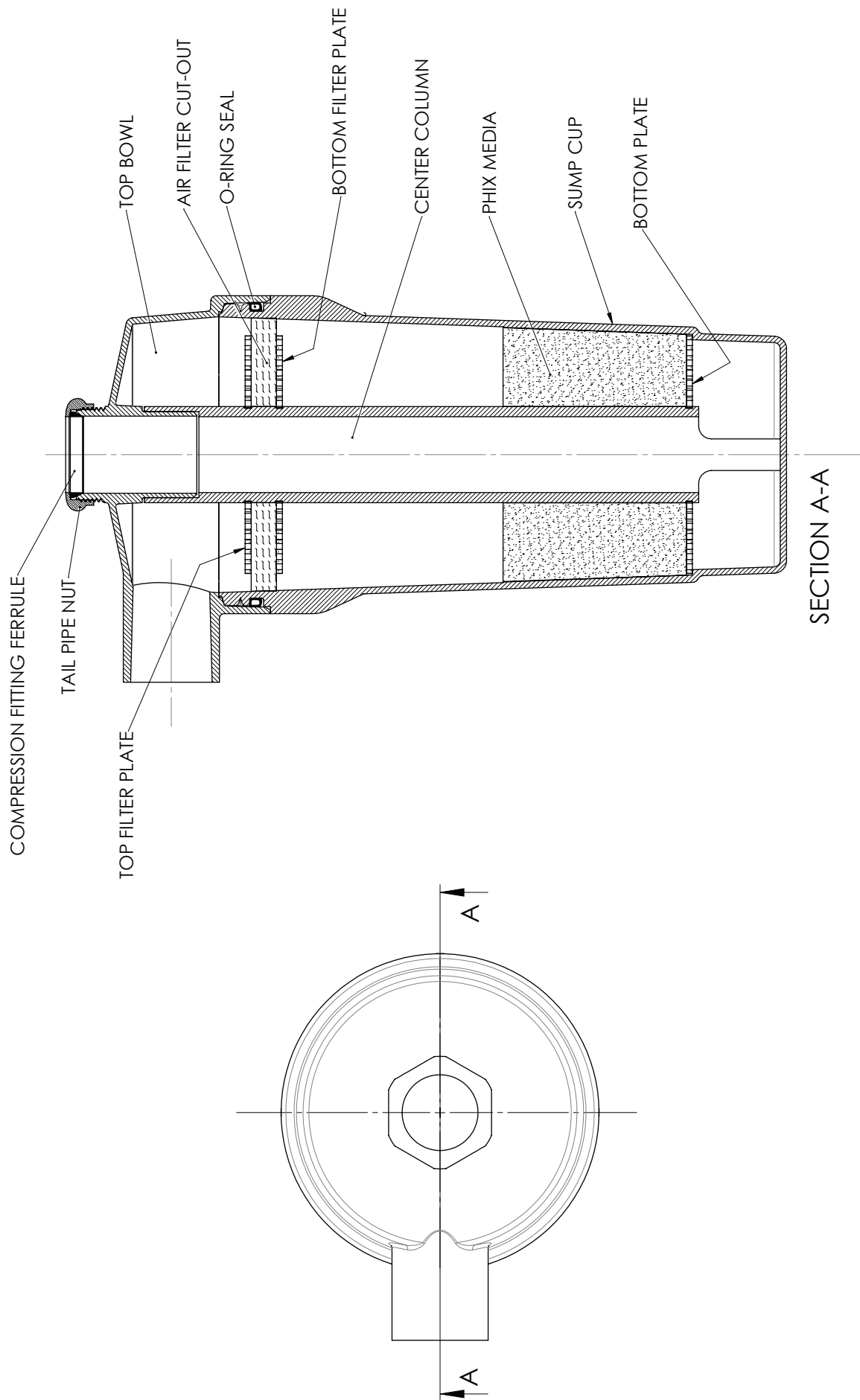
The following replacement parts are available for the PHIX Cartridge. Contact a Zurn Customer Care Representative for more information at 1-855-ONE-ZURN or visit www.Zurn.com

REPLACEMENT PARTS
PHIX Media
O-ring
Filter
Top or Bottom Filter Plate
Media Filter Plate



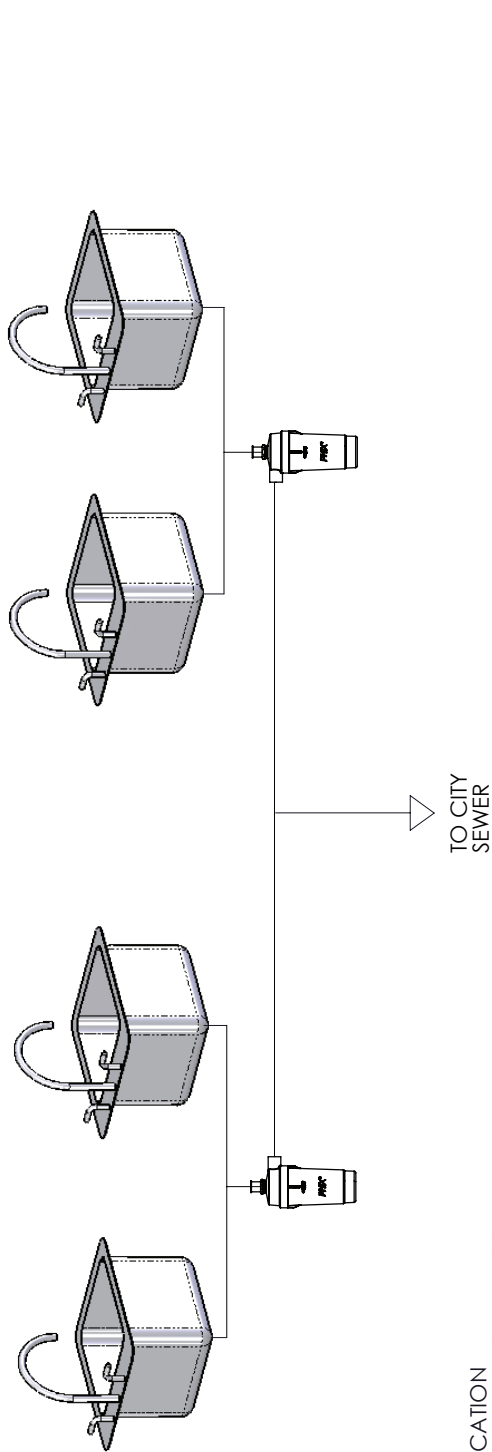
5) PHIX Cartridge System Technical Drawing and Installation Configuration



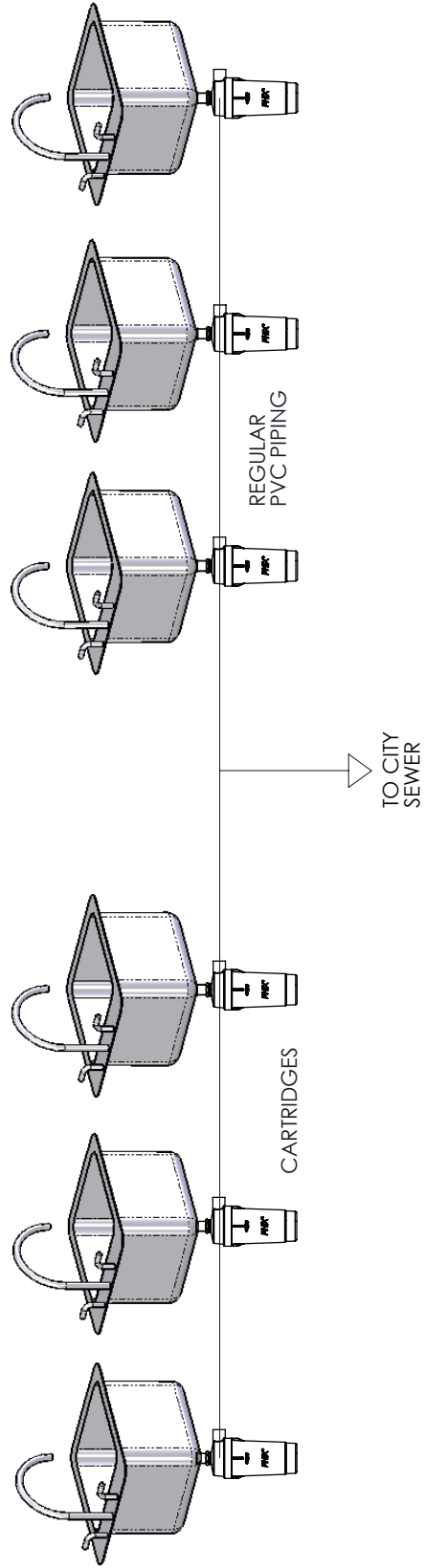


PHIX Cartridge Configurations

A LIGHT APPLICATION



B UNDER THE SINK APPLICATION
(i.e. HOSPITAL, LABORATORY, HIGH SCHOOL
PHARMACEUTICAL, UNIVERSITY LAB)



6) General Terms and Conditions

Price and Terms of Payment

Terms are net, payable 30 days from date of invoice. All pricing in U.S. currency. The Buyer shall pay all sales, consumers, or other applicable taxes. A 1-1/2% monthly (18% annual) service charge will be added to the outstanding balance of all past due invoices.

Minimum invoice \$100.00. Zurn Industries, LLC ("Zurn") reserves the right to apply a minimum order charge in order to meet the \$100.00 minimum invoice requirement. All orders are subject to credit approval by the Zurn Credit Department prior to the acceptance of an order. Orders may be refused, delivery may be withheld, or shipment stopped in transit without any liability on Zurn's part at Zurn's sole discretion based upon Buyer's credit worthiness as determined by Zurn.

Freight

Zurn is pleased to provide an industry-leading \$3,500 combined freight rate. Please see below for specific policy details.

All sales are F.O.B. seller's location. Zurn will allow full freight allowance when any of the following conditions are met:

- 1) any combination of Specification Drainage, Light Commercial, Commercial Brass or Wilkins orders of \$3,500 or more;
- 2) Linear Drainage and Chemical Drainage orders of \$5,000 or more; 3) any Combination of Specification Drainage, Light Commercial, Commercial Brass, Wilkins, Linear Drainage and Chemical Drainage orders of \$5,000 or more; 4) Zurn One Systems orders of \$7,500 or more; 5) fixture only orders totaling \$10,000 or more. This full freight allowance applies when the shipment is within the continental United States and has a single destination of a buyer's standard address or job location. Routing of shipment shall be determined at the sole direction of Zurn. Shipping dates are estimates and time of delivery shall not be of the essence of this sale contract. Under no circumstances will the Seller have any responsibility on account of any delays in manufacture, transportation, or otherwise. Terms of Export Shipment on application.

NOTE: Any product dimension larger than 92" or any single item weighing more than 3,500 lbs., shall be defined as an oversized and/or overweight product and Zurn's standard FFA terms may not apply. Please contact our customer service department for guidance on potential additional shipping charges.

These charges and restrictions apply in addition to Zurn standard terms and conditions for sale unless otherwise agreed upon by the parties.

Limited Warranty

Zurn goods sold hereunder are warranted to be free from defects in material and factory workmanship for the period of time from the date of purchase: AquaVantage® Flush Valves, AquaFlush® Flush Valves, Commercial Fixtures, Faucets, Showers, and Tubular Brass three years; Chemical Drainage, Linear Drainage, Light Commercial, Specification Drainage, Zurn Wilkins, and Flush Valve and Tubular Brass decorative finishes one year; PHIX cartridge ten years. Where permitted by law, THE IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO THE ABOVE IDENTIFIED PERIOD OF TIME AND SHALL BE LIMITED SOLELY TO THE REPLACEMENT OF THE DEFECTIVE GOODS. A damaged/broken test cock or ball valve is not considered defective. Please contact Zurn Customer Care for assistance.

Zurn will replace goods at no cost that prove defective provided Zurn is notified in writing of such defect and the goods are returned prepaid at the specified Zurn location with evidence that they have been properly maintained and used in accordance with instructions. ZURN SHALL NOT BE RESPONSIBLE FOR ANY LABOR CHARGES OR ANY LOSS, INJURY, OR DAMAGES WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL

DAMAGES. The sole and exclusive remedy shall be limited to the replacement of the defective goods. Before installation and use, the purchaser shall determine the suitability of the product for his intended use and the purchaser assumes all risk and liability whatever in the connection therewith. All weights stated in Zurn catalogs and lists are approximate and are not guaranteed.

Returned Goods

Standard cataloged material may be returned only with written permission of Zurn. Returned goods are subject to a 25% restocking charge of total saleable material returned, plus cost of reconditioning, if necessary, to make material sellable. Transportation charges are the responsibility of the Buyer. Credit allowance will be in the form of merchandise credit only – not cash credit. The value of the return must total at least \$100.00 to qualify for credit allowance. No credit will be allowed for parts unless originally ordered and invoiced as parts. No credit will be allowed for discontinued or made-to-order items. Items that have been specially made are not subject to return or cancellation except by special negotiation. Material must be returned within one year of invoice date for credit to be issued for Chemical Drainage, Linear Drainage, and Light Commercial. Material must be returned within two years of invoice date for credit to be issued for Commercial Fixtures, Flush Valve Products, Specification Drainage, Tubular Brass, and Zurn Wilkins. No credit is allowed for Linear Drainage products that have been cut and Specification Drainage product with auxiliary tappings. Flush Valve material over two years old will be subject to a 50% handling charge. Flush Valve material over five years old will not be accepted. Light Commercial and Specification Drainage galvanized material will be credited at value of Dura-Coated cast iron, and chrome plated at value of bronze. Zurn Wilkins damaged/broken test cocks or ball valves are not considered defective.

Illustrations of Typical Installations

The typical installations for various products found in each product section are intended to illustrate the products and potential options for the use of these products. Under no circumstances are they to be construed as recommended installation procedures. Consult local codes and project specifications for proper installation instructions.

Shortage/Damage Claims

Notification of material shortages or incorrect filling of orders must be made to Zurn within 10 days of receipt. No claims over three months old will be honored. Buyer agrees to make all complaints for damage in transit or "short count" directly to the carrier; before the contents are unloaded have the carrier agent's acknowledgment of such damage noted on the bill of lading and to present to the carrier its agent's acknowledgment of such damaged material with formal claim covering said damage.

General

Zurn reserves the right to make changes in design or equipment of any item or product without incurring any obligation on previously sold items, and to discontinue items at any time, without notice. Possession of this Catalog or other sales literature is not to be construed as an offer to sell. All orders are subject to acceptance by Zurn. Catalog printed in U.S.A.

Zurn flush valves are designed to comply with Army Corp of Engineers and Naval guide specifications, Military Specification MIL.V.29193 and Federal Specification WWP541.

Zurn flush valves comply with the following standards: ASME A112.18.1/CSA B125.1, A112.19.5, A112.19.2, A112.19.6, ASSE 1037 and 101 are listed by the following agencies: Canadian Standards, IAPMO/UPC/CUPC, and CSA 125.3. Zurn flush valves are manufactured from dezincification resistant alloys. For additional compliances, contact Zurn Industries, LLC, Commercial Brass Operation, or 1-800-997-3876.

Zurn is not responsible for typographical errors. The contents of this guide are subject to revision without notice.

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⚠ **ADVERTENCIA:** Cáncer y daño reproductivo - www.P65Warnings.ca.gov
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www.P65Warnings.ca.gov

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1801 Pittsburgh Avenue, Erie, PA 16502, 855.663.9876

In Canada: **ZURN INDUSTRIES LIMITED** 7900 Goreway Drive, Unit 10, Brampton, Ontario L6T 5W6, 877.892.5216

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