



## MINIPAK DUST SUPPRESSION SYSTEM SYSTEM INSTALLATION GUIDELINES

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## IMPORTANT

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Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by Guatemala National Standards.

The following symbols may be used in this manual:



**Danger:** Immediate hazards that will result in severe personal injury or death.



**Warning:** Hazards or unsafe practices that could result in personal injury.



**Caution:** Hazards or unsafe practices that could result in product or property damages.



**Important:** Instructions that must be followed to ensure proper installation/operation of equipment.



**NOTE:** General statements to assist the reader.

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# 1.0 IMPORTANT SAFETY AND INSTALLATION INFORMATION

## 1.1 Important User Information

These guidelines have been developed as a quick reference tool to properly installing a Benetech® MiniPak system. It is not intended to replace factory user manuals or technical documentation supplied with Benetech® equipment.

Because of the variety of uses for the equipment described in this manual, those responsible for the application and use of these products must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards. Factory-provided user manuals and technical documentation should not be solely relied on for those purposes.

Benetech® reserves the right to change the features or characteristics of its products and services at any time. Therefore, the information contained in this manual is subject to change at any time without notice.

The illustrations, charts, diagrams, and layout examples shown in these guidelines are intended solely as examples. Since there are many variables and requirements associated with any particular installation, Benetech® does not assume responsibility or liability for actual use based upon the examples shown in these guidelines.

## 1.2 Safety Recommendations for Installation Personnel

All installation work should be done by qualified personnel familiar with the construction, operation, and hazards involved with the equipment. The appropriate work practices of NFPA 70E should be followed.

## 1.3 Tools Required for Installation

- One (1) 6" to 8" Crescent adjustable wrench
- Two (2) 12" to 16" Channel-lock type pliers
- One (1) 8" to 10" flat blade screwdriver
- One (1) roll, Teflon tape
- One (1) gallon, water, drinking quality
- One (1) pair, work gloves and safety glasses

## 1.4 One (1) MINIPAK System includes the following:

- One (1) MINIPAK pump system with 1" union inlet and outlet connections. Note: Male Cam fittings to be attached to unions, are included in the Hose Kit.
- Two (2) MINIPAK-Manifold each with:
  - One (1) 1" diameter x 72" long manifold with cam-lock connector fitting for hose connection. Each manifold can be broken down into two pieces by disconnecting the Chicago style coupling in the middle of the manifold
  - Two (2) 54" pieces of the galvanized strut (for supports)
  - Four (4) 1" strut pipe clamps



- Four (4) sets of locking pliers to secure strut pieces to conveyor support Channels
  
- One (1) MINIPAK - Spray Tips Box with assorted spray tips as described in Table A on page 7 of this guideline.
  
- One (1) MINPAK — Hose Kit including:
  - Two (2) 1” diameter x 25-foot long hose assemblies with cam-lock fittings
  - Two (2) 1” diameter x 5-foot long hose with cam-lock fittings, to connect two manifolds to one 25’ long hose
  - One (1) Tee fitting with cam-lock connector fittings
  - One (1) Cam-lock x Chicago type adapter to allow connection to a Chicago style water supply
  - One (1) Garden Hose x Cam-lock type adapter to allow connection of a ¾” garden hose
  - Two (2) Cam-lock x Male NPT adapters to connect MiniPak hose assemblies to the MiniPak.

## 2.0 MINIPAK SYSTEM INSTALLATION

# IMPORTANT

Read the entire section before beginning installation.

### 2.1 GATHER SITE INFORMATION

Installer should meet with the customer and discuss material to be treated, transfer rate (tons per hour), any moisture limitations for material treated, locations where dust problem exists, and available water supply.

NOTE: Typical application locations are conveyor transfers or stackouts.

### 2.2 SITE SURVEY & MANIFOLD SELECTION

Once a application point has been agreed upon and the load on the conveyor belt is known, examine the conveyor layout to determine manifold locations and spray tip selection.

2.2.1 Measure width of material on a conveyor belt. Using TABLE B on the following pages, you will be able to determine the manifold to use (1 tip or 2 tips) and the distance from the material to the manifold.

2.2.2 Once you know the load on the belt and the percent moisture you want to at, you can determine spray tip requirements.

NOTE: If moisture addition is in question, begin testing at 1% if the product is coal or oil based, and ½% if the product is rock, cement, or ash based. Flow rates can be optimized during the test.

2.2.3 Using TABLE A, on the following pages, you can match your tonnage rate with the moisture addition to determine what style of the manifold is required - 1 spray tip or 2 spray tips and determine what spray tip(s) to use.

NOTE: All spray manifolds are designed for two spray tips. If a single tip manifold is recommended, use the ¼" threaded plug provided in either manifold opening to switch to one tip and center that tip above the material flow.

**TABLE A**

<b>TONS PER HOUR</b>	<b>MANIFOLD REQUIRED</b>	<b>1/4% Moisture (0.6 GPT)</b>	<b>1/2% Moisture (1.2 GPT)</b>	<b>1% Moisture (2.4 GPT)</b>	<b>1-1/2% Moisture (3.6 GPT)</b>
20	QTY 2 - 1 TIP	0.2 GPM = QTY 1 TIP A IN ONE MANIFOLD	0.4 GPM = QTY 2 TIP A	0.8 GPM= QTY 4 TIP A	1.2GPM = QTY 2 TIP B, QTY 1 TIP A
50	QTY 2 - 1 TIP	0.5 GPM = QTY 1 TIP B IN ONE MANIFOLD	1GPM = QTY 2 TIP B	2 GPM= QTY 2 TIP C	3GPM = QTY 2 TIP D
100	QTY 2 - 1 TIP	1 GPM = QTY 2 TIP B	2 GPM = QTY 2 TIP C	4 GPM= QTY 2 TIP E	6 GPM = QTY 2 TIP F
200	QTY 2 - 1 TIP	2 GPM = QTY 2 TIP C	4 GPM = QTY 2 TIP E	8 GPM= QTY 2 TIP G	12 GPM = QTY 2 TIP H
300	QTY 2 - 1 TIP	3 GPM = QTY 2 TIP D	6 GPM = QTY 2 TIP D	12 GPM= QTY 4 TIP F	18 GPM = QTY 2 TIP H , QTY 2 TIP F
400	QTY 2 -2 TIP	4 GPM = QTY 4 TIP C	8 GPM = QTY 4 TIP E	16 GPM = QTY 4 TIP G	NOT AVAILABLE
500	QTY 2 - 2 TIP	5 GPM = QTY 2 TIP D, QTY 2 TIP C	10 GPM = QTY 2 TIP F, QTY 2 TIP E	20 GPM= QTY 2 TIP G, QTY 2 TIP H	
600	QTY 2 -2 TIP	6 GPM = QTY 4 TIP D	12 GPM = QTY 4 TIP D	NOT AVAILABLE	
700	QTY 2 -2 TIP	7 GPM = QTY 2 TIP D, QTY 2 TIP E	14 GPM = QTY 2 TIP H, QTY 2 TIP G		
800	QTY 2 -2 TIP	8 GPM = QTY 4 TIP E	16 GPM = QTY 4 TIP G		
900	QTY 2 -2 TIP	9 GPM = QTY 2 TIP F, QTY 2 TIP D	18 GPM = QTY 2 TIP F, QTY 2 TIP H		

<b>TIP DESIGNATION</b>	<b>QTY INCLUDED IN KIT</b>
TIP A = 90700 (1/4 HVV5002)	2
TIP B = 92381 (1/4HVV5005)	2
TIP C = 92340 (1/4HU5010)	4
TIP D = 92341 (1/4HVV5015)	4
TIP E = 94585 (1/4HU5020)	4
TIP F = 92342 (1/4HU5030)	4
TIP G = 96840 (1/4HU5040)	4
TIP H = 99736 (1/4HU5060)	2
TIP J = 95020 (1/4HU5070)	2
TIP K = 90006 (1/4HU5090)	2

**TABLE B**

<b>WIDTH OF MATERIAL STREAM ON CONVEYOR OR IN CHUTE (INCHES)</b>	<b>MANIFOLD TYPE</b>	<b>DISTANCE FROM BELT OR MATERIAL IN CHUTE (INCHES)</b>
12	1 TIP	15
16	1 TIP	20
20	1 TIP	24
24	2 TIP	15
28	2 TIP	20
32	2 TIP	24

## 2.3 MANIFOLD INSTALLATION

The typical MiniPak System is supplied with two spray manifolds to be located at a conveyor transfer or conveyor stackout. The Benetech wet suppression systemizes most effective when multiple surfaces of the material being transferred are treated.

2.3.1 At a conveyor transfer or conveyor stackout, the most effective locations for spray manifolds are above and below the material flow after it falls off the head pulley. This type of application treats the maximum amount of surface area of the material and promotes the best distribution of the suppression spray.

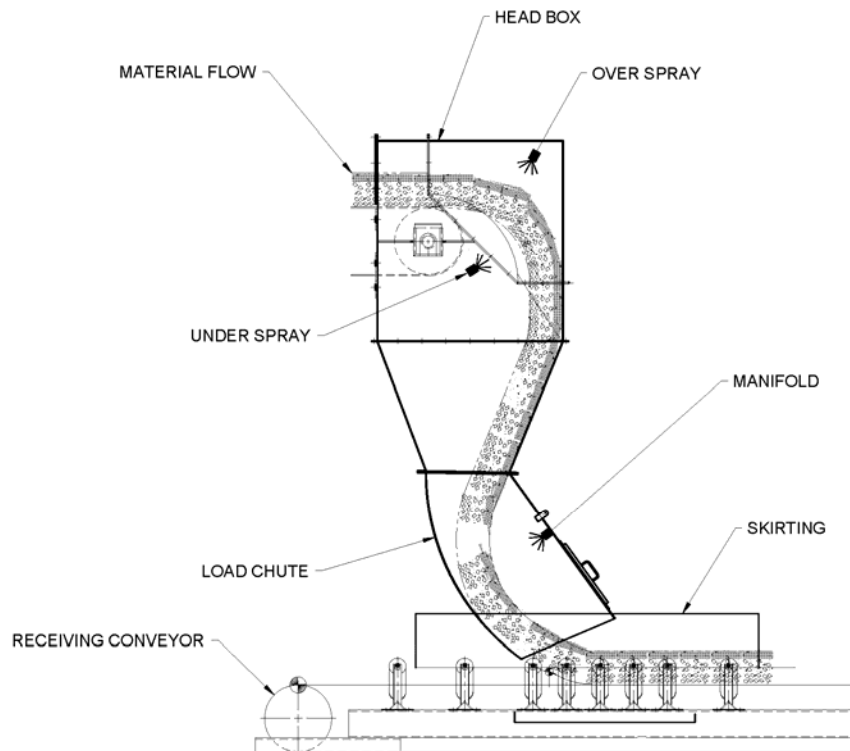
NOTE: The lower manifold must be positioned so that debris from any type of belt scraper will not inhibit the spray pattern or plug spray tips.

2.3.2 If the upper manifold cannot be located after the head pulley, it can be installed above the conveyor near the head pulley.

2.3.3 If the lower manifold cannot be installed below the head pulley, the next favorable location will be at the impact point on the transfer conveyor. This manifold should direct the spray directly at the impact location where maximum spray distribution can occur. If this is not acceptable or the application is a stackout, then install both manifolds above the material flow near the head pulley.

2.3.4 In addition to manifolds the kit also includes manifold supports. Unistrut pieces can be secured firmly to the conveyor support channels using the supplied vice clamps and will allow the manifolds to be mounted above or below the material flow at a head pulley location.

FIGURE A



## **2.4 MINIPAK INSTALLATION**

2.4.1 Locate MiniPak on a flat, level surface so that the door can be opened and the water flow rate and pressure, water filter clarity, and chemical flow rate can be safely monitored and adjusted during operation.

2.4.2 .When facing the MiniPak with the cover opened to the right, the 1" water inlet is located on the lower left side and the 1" solution outlet is located on the upper right side. On the lower right side, there is an opening to route the chemical supply hose to the chemical container.

2.4.3 Location of the chemical supply container is limited by the length of suction hose provided with the chemical pump. The chemical pump has up to 10 feet of suction lift capability, so the chemical supply container can be placed below the MiniPak, 10 feet maximum.

## **2.5 SOLUTION HOSE INSTALLATION**

2.5.1 Each MiniPak System is supplied with hose assemblies and cam-lock fittings to connect the equipment enclosure with the spray manifolds.

2.5.2 Two (2) five-foot-long hoses and cam-lock style required fittings are supplied to connect from the manifolds to a cam-lock style tee connector provided.

2.5.3 From a single manifold or the cam-lock tee connector, a single hose should be installed back to the MiniPak using either one or two of the 25-foot hose assemblies provided.

2.5.4 In addition to hose and fittings, the kit includes tie-wraps for securing the solution hose to the conveyor structure to minimize safety concerns

## **2.6 WATER HOSE INSTALLATION**

2.6.1 Depending upon the location of the MiniPak and the manifolds, one of the two 25 foot hose assemblies may be available to connect to the customer's water supply.

2.6.2 The MiniPak hose kit also includes two hose adapters for connection to a customer's water supply

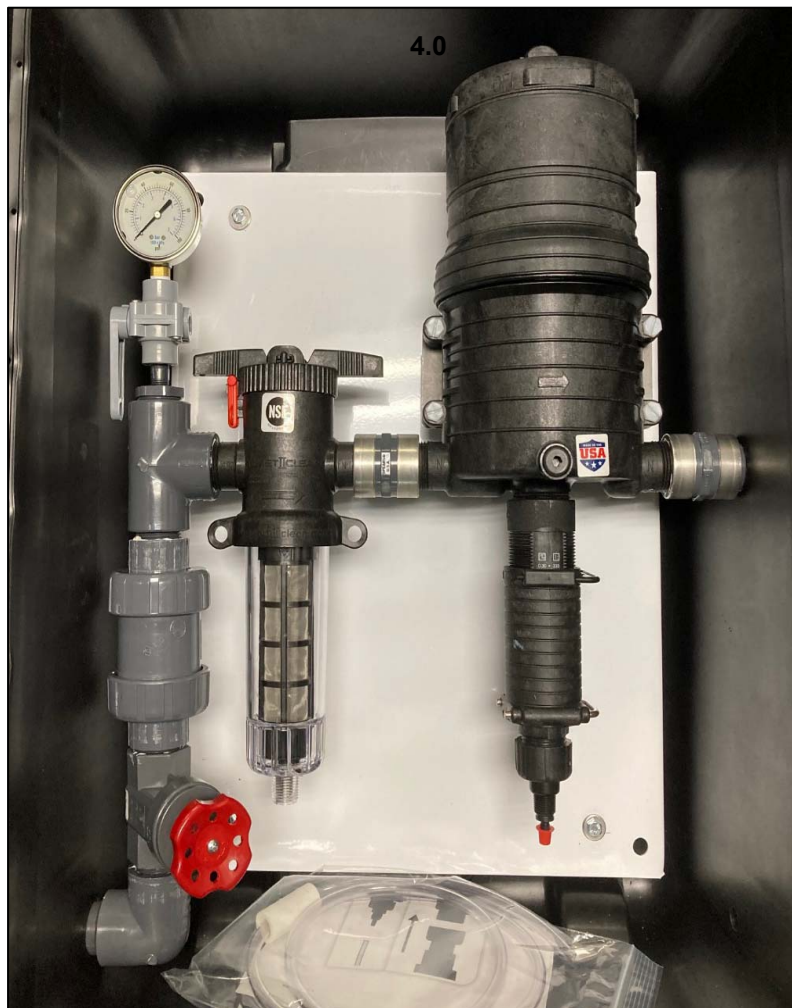
2.6.2.1 One (1) ¾" Female garden hose (GHT) x 1" Female Cam-lock

2.6.2.2. One (1) 1" Chicago style twist clamp x 1" Female Cam-lock

### 3.0 OPERATION

The Benetech® MINIPAK Dust Suppression Systems utilize “state-of-the-art” technology to provide a comprehensive dust management program. These all-in-one systems combine a minimal amount of water with a concentrated chemical agent to produce unique dust suppressing spray. This dust suppressing spray applied directly to the conveyed material, controls airborne dust during coal conveying activities.

A Benetech® designed equipment enclosure, complete with all the required water and chemical control piping, houses all the equipment necessary. Solution piping is routed from the equipment enclosure to spray manifolds for the treatment of material during conveying operations.



## **IMPORTANT**

Read the entire section before operating equipment.

## **⚠ WARNING**

Certain hazards are present during the operation of the Dust Suppression System (manifolds/piping under pressure, loud noise, etc.). Appropriate PPE should be used at all times while working around the equipment.

### **3.1 Emergency Stop Procedure**

If at any time during operation the system must be immediately shut down, the following should be performed:

- 3.1.2 Close the Inlet Water Gate Valve in the MINIPAK enclosure.

When the valve is closed, all water flow will stop and the water flow driven chemical pump will stop operation.

### **3.2 General System Requirements**

Before starting the Dust Suppression System, the following must be performed:

## **⚠ WARNING**

**Before opening water supply isolation valves, personnel shall use proper Personal Protective Equipment (PPE). Failure to do so may result in personal injury.**

- 3.2.1 OPEN water supply isolation valve at the source.
- 3.2.2 In the equipment enclosure, SLOWLY OPEN the water inlet isolation valve all the way and verify MAXIMUM 100 PSI on the water supply pressure gauge in the equipment enclosure. If inlet pressure exceeds 100 PSI, an external pressure reducer must be installed.
- 3.2.3 For longer service life, start with a clean, filtered water supply.

## **⚠ WARNING**

**Before connecting the chemical supply house, personnel shall use proper Personal Protective Equipment (PPE). Failure to do so may result in personal injury.**



- 3.2.4 At the chemical storage container, open the cover and insert the hose so that the filter is 2" above the bottom of the container.
- 3.3.5 Keep the chemical storage container covered and clean. Dirt, debris, and other contaminants in the chemical storage container may cause excessive wear to the chemical pump.
- 3.2.6 Route the suction hose from the chemical container, through the opening on the side of the MiniPak equipment enclosure. Connect the hose to the barb fitting located on the bottom of the chemical pump.

### 3.3 Operation

The MINIPAK dust suppression system utilizes a simple, portable, no power required design to combine a minimal amount of water with a concentrated chemical agent and produce unique dust suppressing spray. The system is a simple, one-person, manual operation. The system operation is as follows:

- 3.3.1 Verify that the inlet water is from a clean source and LESS THAN 100 PSI.
- 3.3.2 Open the inlet water valve slowly to allow the strainer and pump to fill with water and begin operation. Set chemical application rate (procedure described later). Water flowing through the chemical pump will cause the internal injector to "click". The higher the chemical flow rate, the more frequent the "clicking".
- 3.3.3 Monitor flow at spray manifold (s) and adjust solution flow at the valve located at each manifold. The maximum system flow rate is 20 GPM.
- 3.3.4 While the system is in operation, the screen on the 140 mesh water filter may become plugged with debris.
- 3.3.5 To clean the filter, with water flowing, lift the red safety latch located below the top handle of the strainer.
- 3.3.6 Turn the top handle ¼ turn (perpendicular to flow) to re-direct the flow for cleaning.
- 3.3.7 This will lift the screen element inside the filter bowl and release water through the purge exit on the bottom of the filter. Customers may elect to attach a drain hose to direct the purge flow outside the enclosure and to the desired location
- 3.3.8 After flushing for 10-20 seconds (depending upon debris), turn the top handle back ¼ turn and lower the red safety latch.
- 3.3.9 The output of the chemical can be adjusted from a water/chemical ratio of 333 to 1 down to 4000 to 1. To adjust the chemical flow rate:
- 3.3.10 On the lower stem of the chemical pump remove the UPPER interlock pin.
- 3.3.11 Rotate the adjuster sleeve to the desired setting
- 3.3.12 Re-insert the upper interlock pin.
- 3.3.13 Route the suction hose from the chemical container, through the opening on the side of the equipment enclosure. Connect the hose to the barb fitting located on the bottom of the chemical pump.

## IMPORTANT

After the operation is complete, WITH the water flowing, remove the suction hose from the chemical container and place it in a container with 1 gallon container of freshwater. Flow at least ½ gallon of fresh water through the chemical pump. This will prevent chemical buildup in the pump and rinse the suppression hose lines and manifolds.



## Manifold Kit

- A. (2) MiniPak Manifolds each with (2) 1" diameter x 72" long manifold
- B. (2) 60" piece of galvanized strut (for supports)
- C. (4) 1" strut pipe clamps
- D. (4) sets of locking pliers to secure strut pieces to conveyor support channels
- E. (1) MiniPak –Spray Tips Box with assorted spray tips as described in manual



(A)



(B)



(C)



(D)



(E)

## Hose Assembly Kit

- A. (1) 1" diameter x 50 foot long hose
- B. (2) 1" diameter x 5 foot long hose with camlock connectors to connect two manifolds to 50' long hose
- C. (2) 1" male camlock x 1" male NPT adapter
- D. (1) 1" tee with (2) 1" male camlock and (1) 1" female camlock
- E. (1) 1" female camlock x 3/4" female hose
- F. (1) 1" female camlock x 1" Chicago style coupling
- G. (1) 1" pack of cable ties



(A)



(B)



(C)



(D)



(E&F)

## Tools Needed

- A. (1) 6" to 8" Crescent adjustable wrench
- B. (2) 12" to 16" Channel lock type pliers
- C. (1) 8" to 10" flat blade screwdriver
- D. (1) roll, Teflon tape



(i)



(ii)

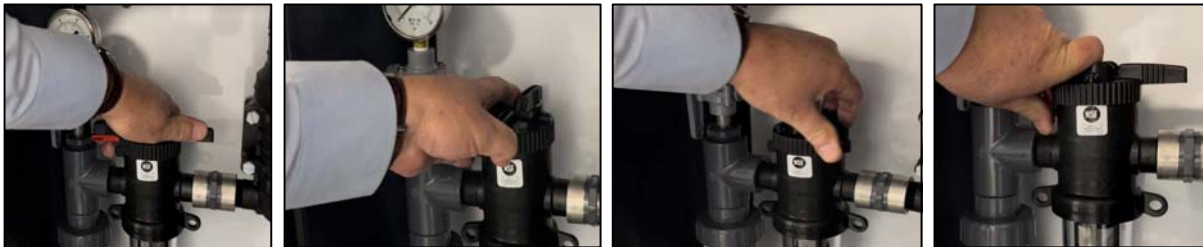


(iii)



(iv)

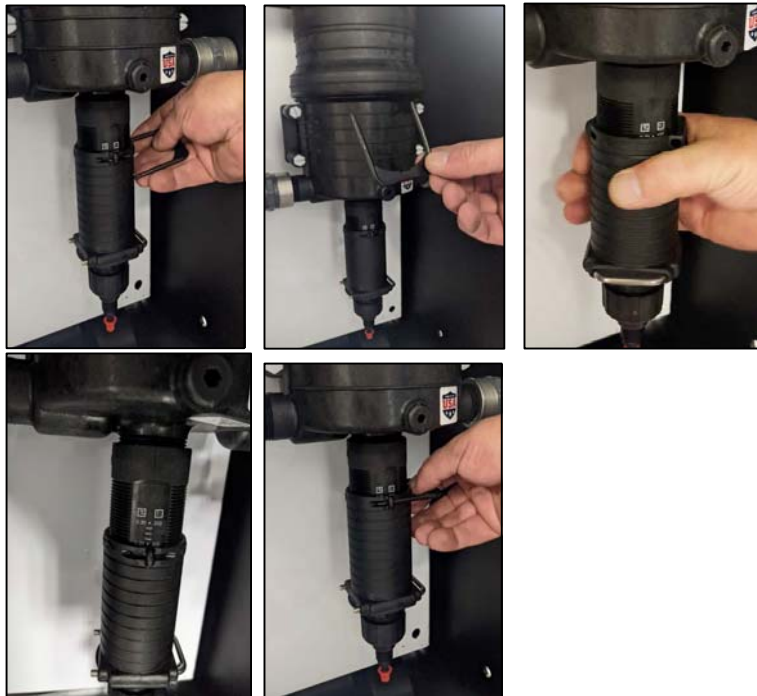
## Flushing Debris from Water Filter



While system is in operation, the screen on the 140 mesh water filter may become plugged with debris. In order to clean the filter:

1. With water flowing, lift the red safety latch located below the top handle.
2. Turn the top handle  $\frac{1}{4}$  turn (perpendicular to flow) to re-direct the flow for cleaning.
3. This will lift the screen element inside the filter bowl and release water through the purge exit on the bottom of the filter. Customer may elect to attach a drain hose to direct the purge flow outside the enclosure and to a desired location
4. After flushing for 10-20 seconds (depending upon debris), turn the top handle back  $\frac{1}{4}$  turn and lower the red safety latch.

## Adjusting Chemical Flow Rate

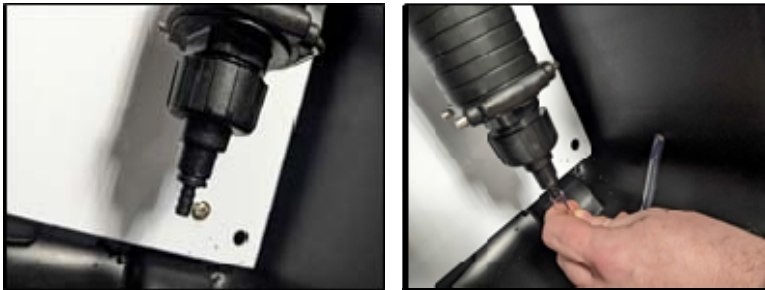


1. Remove the upper interlock pin.
2. Rotate the adjuster sleeve to the desired setting
3. Re-insert the upper interlock pin.

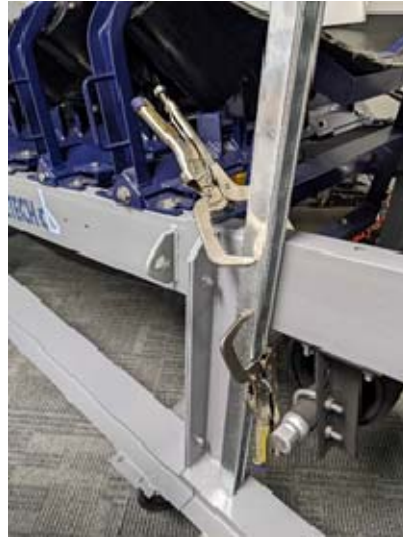


## Attaching Chemical Hose

1. Locate and remove the red cap on the end of the pump.
2. Insert the chemical hose through the provided opening.
3. Connect to the pump as shown.
4. Place chemical suction hose in a 5 gallon bucket of chemical.



## Manifold Installation



- Place unistrut galvanized supports against conveyor frame.
- Secure in place using the vice clamps supplied.



- Assemble Manifold ensuring both pins are in place around the Chicago style fitting.
- Insert selected spray tips.
- Use strut pipe clamps to secure manifold to unistrut supports.



## Solution Hose Installation



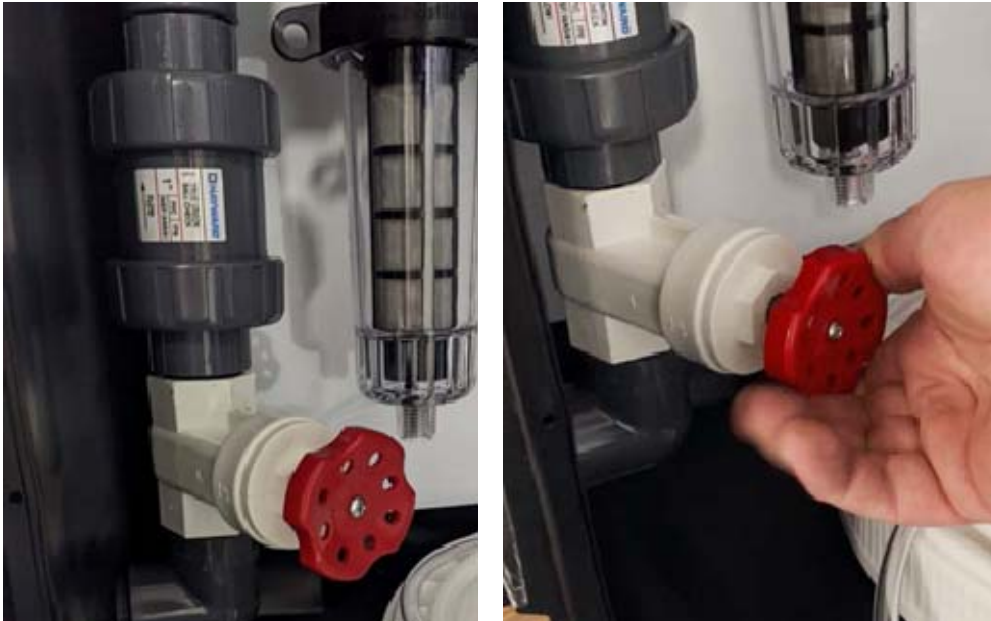
- Each MiniPak System is supplied with a hose and fittings to connect the equipment enclosure with the spray manifolds.
- If required, two (2) five-foot-long hoses and fittings are supplied to connect from the manifolds to the main fifty (50) foot long hose assembly connected to the equipment enclosure.
- In addition to hose and fittings, the kit includes tie-wraps for securing the solution.

## Emergency Stop Procedure

If at any time during operation the system must be immediately shutdown, the following should be performed:

- Close the Inlet Water Gate Valve in the MINIPAK enclosure.

When the valve is closed all water flow will stop and the water flow driven chemical pump will stop operation.



## Drain Chemical After Test

After the operation is complete, remove suction hose from chemical container and replace it with 1 quart or more of fresh water. Flow fresh water through the chemical pump by operating until the water container is empty.

Be mindful of where the drained fluids go (solution lines may possibly still contain surfactant if not fully flushed).

Be mindful not to leave a mess at your facility. \*If there is solution left in the lines, it could possibly leave a “foamy” puddle. This is not an acceptable practice.

# TWISTIICLEAN

Installation Instructions for: 3/4-inch Model T2C-075  
1-inch Model T2C-100  
1 1/2-inch Model T2C-150

# Installation and Operation Guide

## Pre-Installation Checklist

- A. Select a good filter location:
- Install on the pressure (outlet) side of any pumps and pressure tanks
  - In a vertical position with Purge Exit pointing down
  - Away from extreme weather conditions to protect from freezing
  - At least 12 inches away from walls or obstructions, so top handle can be twisted
  - Allow enough clearance beneath the unit to:
    - (a) attach a purge drain hose to the Purge Exit (recommended)
    - (b) remove the clear bowl assembly, to allow replacement of element as needed
- B. As a sunny outdoor installation might lead to algae growth inside the clear bowl and affect the operation of your TWISTIICLEAN, an optional Sun Shield is available.

### Maximum Flow Ranges:

- T2C-075 3/4" Inlet/Outlet: 0 to 25 US gpm (0 to 5.7 m<sup>3</sup>/hr)
- T2C-100 1" Inlet/Outlet: 0 to 39 US gpm (0 to 8.9 m<sup>3</sup>/hr)
- T2C-150 1 1/2" Inlet/Outlet: 0 to 78 US gpm (0 to 17.7 m<sup>3</sup>/hr)

### Maximum Pressure:

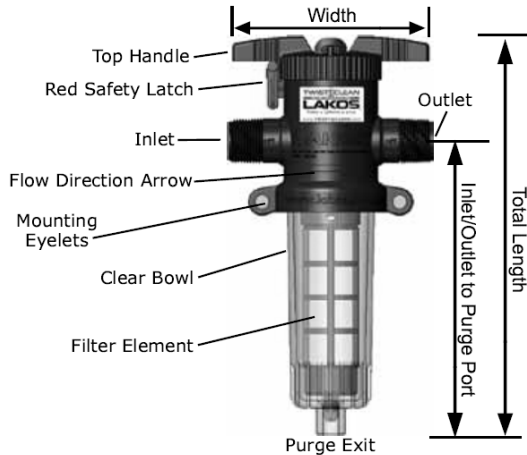
- 100 psi at 73°F (6.9 bar at 38°C)

### Temperature Range:

- 32°F - 120°F (0°C - 49°C)

### Mesh Sizes:

- 30 Mesh (600 Micron) Element (Brown)
- 60 Mesh (250 Micron) Element (White)
- 100 Mesh (150 Micron) Element (Gray)
- 140 Mesh (105 Micron) Element (Black)
- 200 Mesh (74 Micron) Element (Blue)



### Dimensions

Model	Inlet/Outlet	Purge	Total Length	Length (Inlet/Outlet to Purge Port)	Width (Inlet/Outlet)
T2C-075	3/4" MPT	1/2" MPT	11 1/4"	8 3/4"	6"
T2C-100	1" MPT	1/2" MPT	11 1/4"	8 3/4"	6"
T2C-150	1 1/2" MPT	3/4" MPT	15 1/4"	11 3/4"	7 1/2"

## Installation In 7 Easy Steps

1. Remove the TWISTIICLEAN from its box. Check to make sure the box also contains a small dispenser of Teflon tape and two slip/threaded adapters for use if needed.
2. Be sure the clear bowl is securely tightened (hand tighten only). The unit is shipped with the bowl loose. Lift the red safety latch and rotate the top handle a few times to make sure it will rotate 1/4 clockwise turn.
3. Prepare the piping manifold to install TWISTIICLEAN. Select the best fittings for your installation, using slip or threaded fittings as desired. Notice the direction of water flow through the unit -- a flow direction arrow is molded into the side of the unit. (Fig A).
4. Use proper PVC solvents and follow gluing instructions on solvent container. Do not spill solvent on any part of the TWISTIICLEAN unit.
5. Mounting eyelets provide for a more stable installation (Fig B). Stabilizer bolts are recommended for long term stability of your TWISTIICLEAN. Use 3/8" Hex Lag Screws plus washers and PVC pipe to connect to a secure surface. These parts are NOT supplied with your TWISTIICLEAN.
6. Once installed, test by turning water supply on slowly, allowing water to feed through the unit. Check for leaks. After lifting the safety latch, twist the top handle with a 1/4 clockwise turn to re-direct the flow for cleaning. This should lift the screen element inside the bowl and release flush water through the Purge Exit at the bottom of the unit. Twist the handle back to its "run" position, lower the safety latch and check for leaks.
7. Attach a flush drain hose (if necessary) to direct the purged particle matter and excess water to a drain or other desired area for discharge (Fig C).

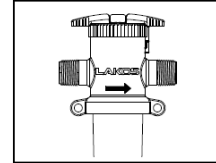


Fig A

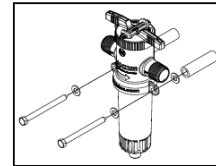


Fig B

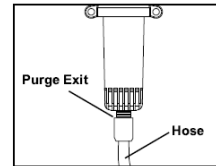


Fig C



SUN SHIELD

### Optional Accessories

#### Sun Shield For Outdoor Installations

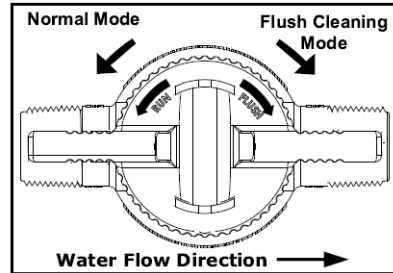
Black neoprene woven cover, slips over bowl to prevent growth of algae and other organics.

Model Size	Sun Shield Part Number
T2C-075 (3/4")	131355
T2C-100 (1")	
T2C-150 (1-1/2")	132240

LS-866B (Rev. 5/13)

# Using Your TWISTIICLEAN

TWISTIICLEAN removes sand and organics as the water passes through the filter element. Periodic cleaning is necessary to optimize filter performance, reduce the



pressure loss and prolong the product life. When the filter element looks like it is filled with debris, it should be cleaned.

Just a gentle 1/4 clockwise TWIST of the top handle begins

the patented reverse flushing action. In just a few seconds, all debris are backwashed off the filter element and flushed out the bottom of the Purge Exit port. BE SURE TO RAISE THE SAFETY LATCH BEFORE TWISTING THE HANDLE AND LOWER IT AFTER FLUSHING.



For proper purging of your TWISTIICLEAN, lift the red safety latch prior to twisting the handle.

## Maintenance and Troubleshooting

If for any reason the filter element does not clean completely during the normal Twist to Clean operation, manual cleaning may be needed. In this case, remove the bowl and clean the element with a soft nylon brush, brushing and running water across element.

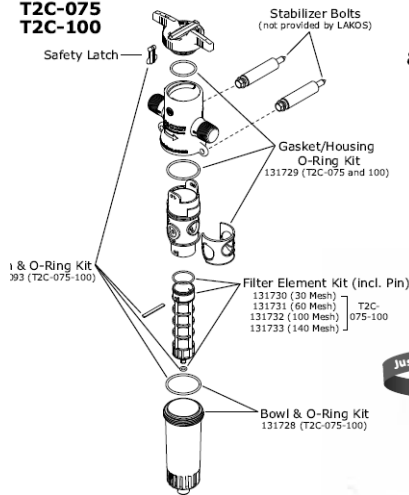
**Caution:** If the filter bowl is to be removed, all water flow must be shut off going to the filter.

## Safety Notes:

Despite the ease of installation and operation of the LAKOS TWISTIICLEAN product, certain precautions should be taken.

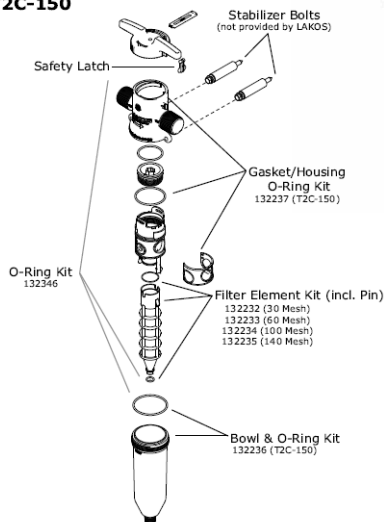
1. Lubricate "O" rings with NSF approved silicon grease only - Dow 111 is recommended.
2. Do not overtighten the threaded connections. Do not tighten more than a 1/4 turn past finger tight. Hand tighten the bowl, do not use tools.
3. Do not use wrenches on plastic filter parts. Use of tools on filter will void warranty.
4. For threaded connections, use the PTFE sealant tape provided with product.
5. Filter components that have "O" rings do not require thread sealant.
6. Remove clear bowl if the filter is to be installed using any solvent welding. This will prevent solvent damage to the clear bowl.
7. This filter is designed for use with water only. Other chemicals or components can damage the filter components. Evaluate all chemicals for proper usage with the filter.
8. Protect unit from freezing, as you would with any other water supply lines.
9. Follow all local and state codes, laws, and regulations when installing any filter.
10. If removal of the screen element is necessary, take care not to damage the element or the components that hold the element in place. The T2C-150 model has latching clips that hold the element in place. Do not spread the clips more than necessary to remove the element.

T2C-075  
T2C-100



## TWISTIICLEAN Exploded View and Spare Parts

T2C-150



## Limited Warranty

The LAKOS TWISTIICLEAN is warranted to be free of material or workmanship defects for at least one year from delivery date.

If a fault develops, notify us, giving a complete description of the alleged malfunction. Include the model number(s), date of delivery and operating conditions of subject product(s). We will subsequently review this information and, at our option, supply you with either servicing data or shipping instruction and returned materials authorization. Upon prepaid receipt of subject product(s) at the instructed destination, we will then either repair or replace such product(s), at our option, and if determined to be a warranted defect, we will perform any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically-caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization. No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

**TWISTIICLEAN**  
INLINE WATER FILTERS  
**LAKOS**  
www.TWISTIICLEAN.com



# TWISTIIICLEAN

Instrucciones de instalación para el: Modelo T2C-075 de ¾ pulg.  
Modelo T2C-100 de 1 pulg.  
Modelo T2C-150 de 1 ½ pulg.

# Guía de instalación y funcionamiento

## Lista de verificación previa a la instalación

- A. Seleccione un buen sitio para el filtro:
- Instale en el lado de presión (salida) de cualesquiera bombas y tanques de presión.
  - En posición vertical con la Salida de purga en dirección hacia abajo.
  - Alejado de condiciones extremas de clima para protegerlo de la congelación.
  - Alejado cuando menos 30 cm (12 pulg.) de paredes u obstrucciones, de manera tal que la manija superior pueda ser girada.
  - Permita el suficiente espacio bajo la unidad para
    - (a) conectar una manguera de drenaje de purga a la Salida de purga (se recomienda).
    - (b) desmontar el conjunto de tazón transparente y permitir el reemplazo del elemento según corresponda.
- B. Dado que una instalación a la intemperie con luz solar puede resultar en brotes de algas dentro del tazón transparente, lo cual afecta el funcionamiento de su unidad TWISTIIICLEAN, se dispone de un Protector solar optativo.

### Gama de máximos caudales:

- T2C-075 con Entrada/Salida de ¾ pulg.: 0 a 5,7 m<sup>3</sup>/h (0 a 25 gpm EE. UU.)
- T2C-100 con Entrada/Salida de 1 pulg.: 0 a 8,9 m<sup>3</sup>/h (0 a 39 gpm EE. UU.)
- T2C-150 con Entrada/Salida de 1 ½ pulg.: 0 a 17,7 m<sup>3</sup>/h (0 a 78 gpm EE. UU.)

### Presión máxima:

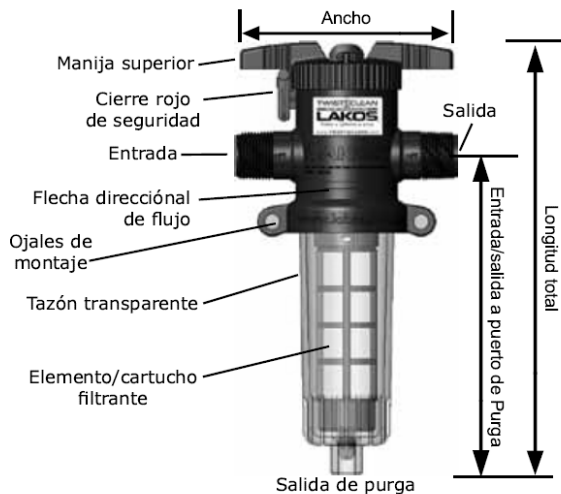
- 6,9 bar a 38°C (100 psi a 73°F)

### Gama de temperaturas:

- 0°C - 49°C (32°F - 120°F)

### Tamaños de malla:

- Elemento de malla 30 (600 micrones) (marrón)
- Elemento de malla 60 (250 micrones) (blanco)
- Elemento de malla 100 (150 micrones) (gris)
- Elemento de malla 140 (105 micrones) (negro)
- Elemento de malla 200 (74 micrones) (azul)



### Dimensiones

Modelo	Entrada/Salida	Purga	Longitud total	Longitud (desde la tubería hasta el puerto de purgado)	Ancho (Entrada/Salida)
T2C-075	MPT ¾ pulg.	MPT ¾ pulg.	29,8 cm (11-3/4 pulg.)	22,2 cm (8-3/4 pulg.)	15,3 cm (6 pulg.)
T2C-100	MPT 1 pulg.	MPT 1 pulg.	29,8 cm (11-3/4 pulg.)	22,2 cm (8-3/4 pulg.)	15,3 cm (6 pulg.)
T2C-150	MPT 1 ½ pulg.	MPT 1 ½ pulg.	38,7 cm (15-1/4 pulg.)	29,8 cm (11-3/4 pulg.)	19,1 cm (7 ½ pulg.)

## Instalación en 7 fáciles pasos

1. Saque la unidad TWISTIIICLEAN de su caja. Verifique que la caja también contiene un pequeño dispensador de cinta selladora y dos adaptadores roscados o deslizantes para usarse en caso necesario.
2. Asegúrese que el tazón transparente esté firmemente apretado (apretar con la mano únicamente). La unidad se envía con el tazón algo suelto. Levante el cierre rojo de seguridad y gire la manija superior unas cuantas veces para asegurarse que girará un cuarto de vuelta en el sentido de las manecillas del reloj (hacia la derecha).
3. Prepare el múltiple de tubería para instalar la unidad TWISTIIICLEAN. Seleccione los mejores conectores para su instalación, mediante el uso de conectores deslizantes o roscados según corresponda. Observe la dirección del flujo de agua a través de la unidad; se ha moldeado una flecha de dirección de flujo del agua en el lado de la unidad (Figura A).
4. Use los disolventes de cloruro de polivinilo (PVC) adecuados y siga las instrucciones de pegar en el recipiente del disolvente. No derrame disolvente en ninguna parte de la unidad TWISTIIICLEAN.
5. Los ojales de montaje proporcionan una instalación más estable (Figura B). Se recomienda el uso de pernos estabilizadores para la estabilidad a largo plazo de su unidad TWISTIIICLEAN. Use tornillos tirafondo (roscados para madera) de 3/8 pulg. además de arandelas y tubería PVC para conectar la unidad a una superficie segura. Estas piezas no se suministran con su unidad TWISTIIICLEAN.
6. Una vez instalada, pruebe la unidad abriendo lentamente el suministro de agua y alimentando agua a través de la unidad. Verifique que no haya fugas. Después de levantar el cierre de seguridad, gire la manija superior un cuarto de vuelta en el sentido de las manecillas del reloj (hacia la derecha) para redirigir el flujo y realizar la limpieza. Esto debe levantar el elemento filtrante dentro del tazón y descargar agua de lavado a través de la Salida de purga en la parte inferior de la unidad. Gire la manija otra vez a su posición de "Run -Funcionamiento", baje el cierre de seguridad y verifique que no haya fugas.
7. Conecte una manguera de drenaje de lavado (según corresponda) para dirigir las particular purgadas y el exceso de agua a un sumidero o a otra área de descarga deseada (Figura C).

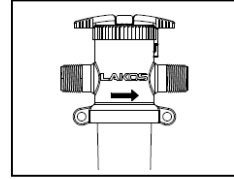


Fig A

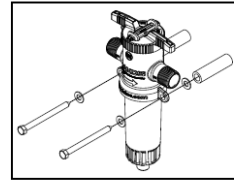


Fig B

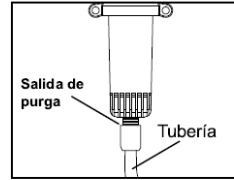


Fig C

## Accesorios optativos

### Protector solar para instalaciones a la intemperie

Cubierta tejida de neopreno negro que se desliza sobre el tazón para prevenir el brote de algas y otros materiales orgánicos.

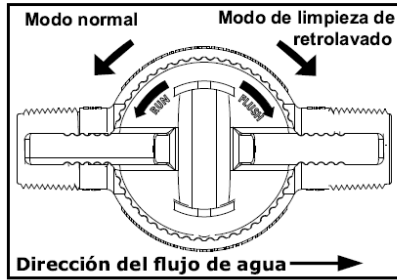
Tamaño de modelo	Número de pieza de Protector solar
T2C-075 (¾ pulg.)	131355
T2C-100 (1 pulg.)	
T2C-150 (1-½ pulg.)	132240



PROTECTOR SOLAR

## Cómo usar su unidad TWISTICLEAN

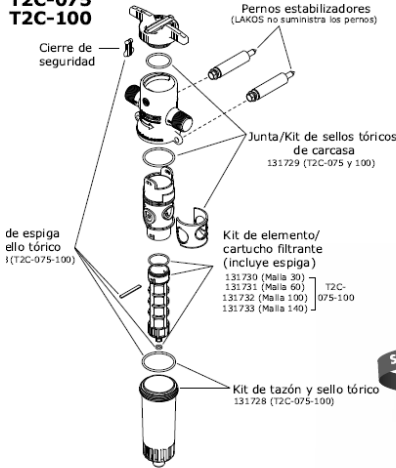
La unidad TWISTICLEAN separa arena y materiales orgánicos a medida que el agua pasa por el elemento/cartucho filtrante. Es necesaria la limpieza periódica para optimizar el rendimiento del filtro,



reducir la pérdida de presión y prolongar la vida de servicio del producto. Se debe limpiar el elemento/cartucho cuando se observa que parece estar lleno de basura. Únicamente se requiere un ligero GIRO de vuelta en el

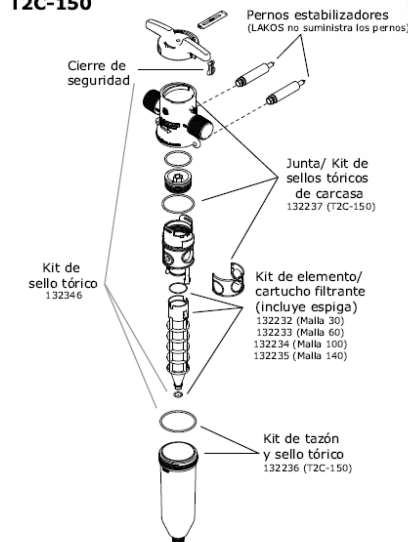
sentido de las manecillas del reloj (hacia la derecha) de la manija superior para iniciar la acción patentada de retrolavado. En unos cuantos segundos toda la basura se lava del filtro y se desecha por el fondo del puerto de Salida de purga. **ASEGÚRESE DE LEVANTAR EL CIERRE DE SEGURIDAD ANTES DE GIRAR LA MANIJA Y DE BAJAR DICHO CIERRE DESPUÉS DEL RETROLAVADO.**

### T2C-075 T2C-100



### Vista despiezada de TWISTICLEAN y piezas de repuesto

### T2C-150



Para el purgado correcto de su unidad TWISTICLEAN, levante el cierre rojo de seguridad antes de girar la manija.

## Mantenimiento y localización de averías

Podrá ser necesaria la limpieza manual si por cualquier razón el elemento/cartucho filtrante no se limpia completamente durante la operación normal de Girar para Limpiar. En este caso, desmonte el tazón y limpie el elemento con un cepillo suave, cepillando y usando agua corriente a través del elemento/cartucho.

**Precaución: Si es necesario desmontar el tazón del filtro, se debe cerrar el flujo de agua que va al filtro.**

### Notas de protección:

A pesar de la facilidad para instalar y operar la unidad TWISTICLEAN de LAKOS, se deben tomar ciertas medidas de precaución.

1. Lubrique los sellos tóricos con grasa de silicona aprobada por la NSF International – se recomienda la grasa Dow 111.
2. No apriete demasiado las conexiones roscadas. No apriete más de un cuarto de vuelta una vez que se aprieten con los dedos. Apriete el tazón con la mano; no use herramientas.
3. No use llaves en las piezas de plástico del filtro. El uso de herramientas anulará la garantía.
4. Para conexiones roscadas, use el sellador tipo cinta Teflon™ suministrado con la unidad.
5. Los componentes del filtro que tienen sellos tóricos no requieren sellador de roscas.
6. Desmonte el tazón transparente si el filtro se va a instalar mediante el uso de pegamento disolvente. Esto impedirá que el disolvente dañe el tazón transparente.
7. Este filtro está diseñado para usarse con agua únicamente. Otros químicos o componentes pueden dañar a los componentes del filtro. Evalúe todos los químicos con respecto al uso correcto con el filtro.
8. Impida que la unidad se congele, de igual manera que con cualesquiera otras líneas de suministro de agua.
9. Al instalar cualquier filtro siga todos los códigos, leyes y reglamentos emitidos por las autoridades locales y de los departamentos, estados y provincias correspondientes.

## Garantía limitada

La unidad TWISTICLEAN LAKOS está garantizada de no tener defectos en materiales y mano de obra durante un año a partir de la fecha de entrega.

Notifiquenos si se desarrolla una falla, dándonos una descripción completa de la avería alegada. Incluya el/los número/s de modelo, fecha de entrega y condiciones de funcionamiento de los producto/s en cuestión. Nosotros posteriormente estudiaremos esta información y, a nuestra opción, le suministraremos a usted ya sea con información de servicio o con instrucciones de envío y autorización de devolución de materiales. Al recibir el/los producto/s en cuestión con el porte pagado en el destino indicado, nosotros entonces repararemos o reemplazaremos tal/es producto/s a nuestra opción, y si se determina que es un defecto bajo la garantía, realizaremos las reparaciones correspondientes en el/los producto/s o reemplazaremos tal/es producto/s a nuestro coste. Esta garantía limitada no cubre ningún producto, daños o lesiones resultantes del mal uso, negligencia, desgaste normal esperado, corrosión causada por químicos, instalación incorrecta u operación contraria a las recomendaciones de la fábrica. Tampoco cubre equipo que ha sido modificado, forcejeado o alterado sin autorización. No se estipulan otras responsabilidades extendidas declaradas o implícitas, y esta garantía bajo ninguna circunstancia cubre daños, lesiones o costes indirectos o incidentales resultantes de cualquier/cualesquier tal/es producto/s defectuoso/s.

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# SuperDos 20

## Operating Manual



**Model 0.3%**  
**Model 0.3% HAC**  
**Model 2.5%**  
**Model 2.5% WSP**  
**Model 2.5% HAC**  
**Model 5%**  
**Model 5% HAC**  
**Model 10%**

**Fluid Flow Range:**  
0.05 gpm to 20 gpm  
11 lph to 4,500 lph

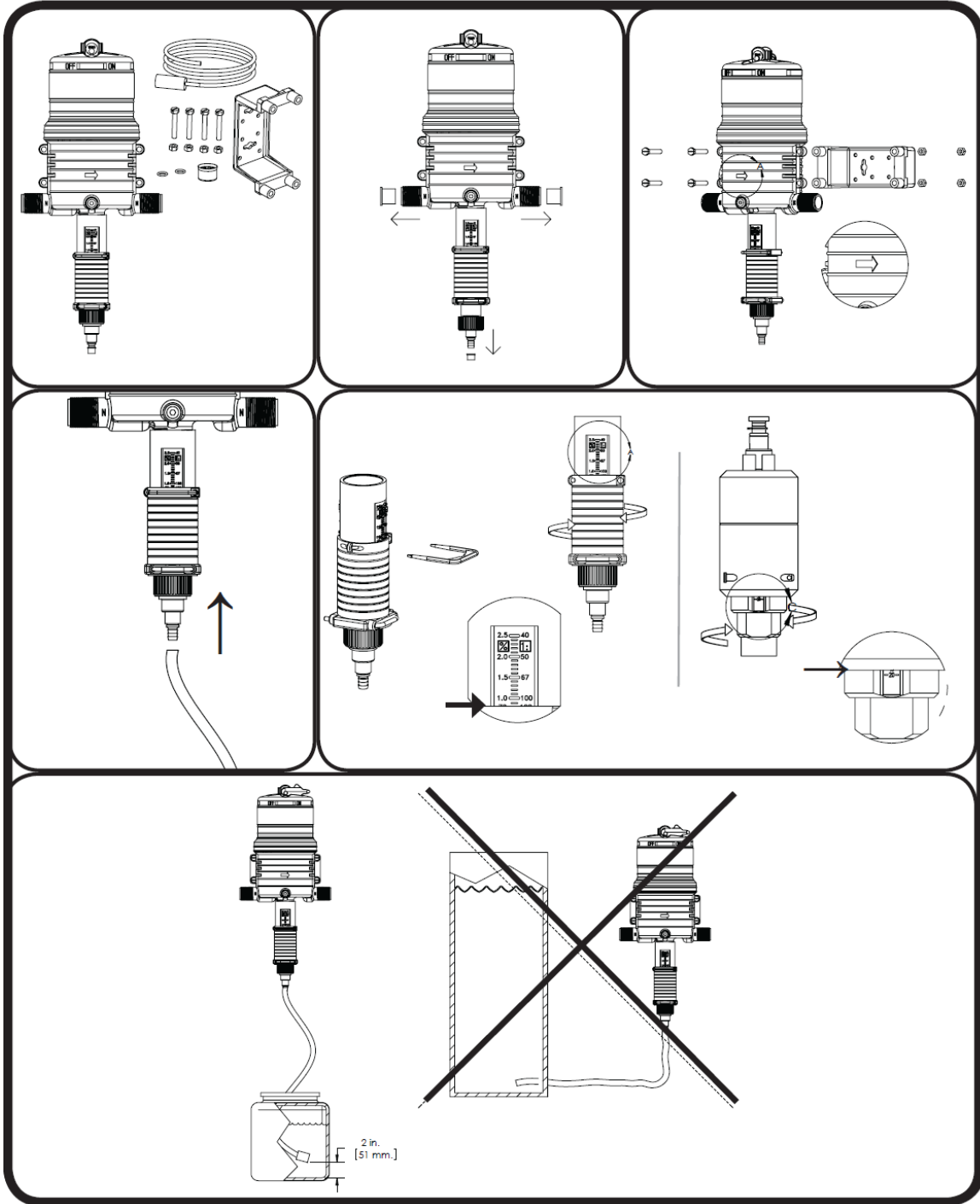
**Injection Range**  
**Dosage:**  
0.025% to 10%  
1:4000 to 1:10

**Operating Pressure:**  
5 to 100\* psi  
0,34 to 6,9 bar

\*Specifications vary by model.

**Hydro<sup>®</sup>**  
**systems**  
A **DOVER** COMPANY

# Quick Start-up



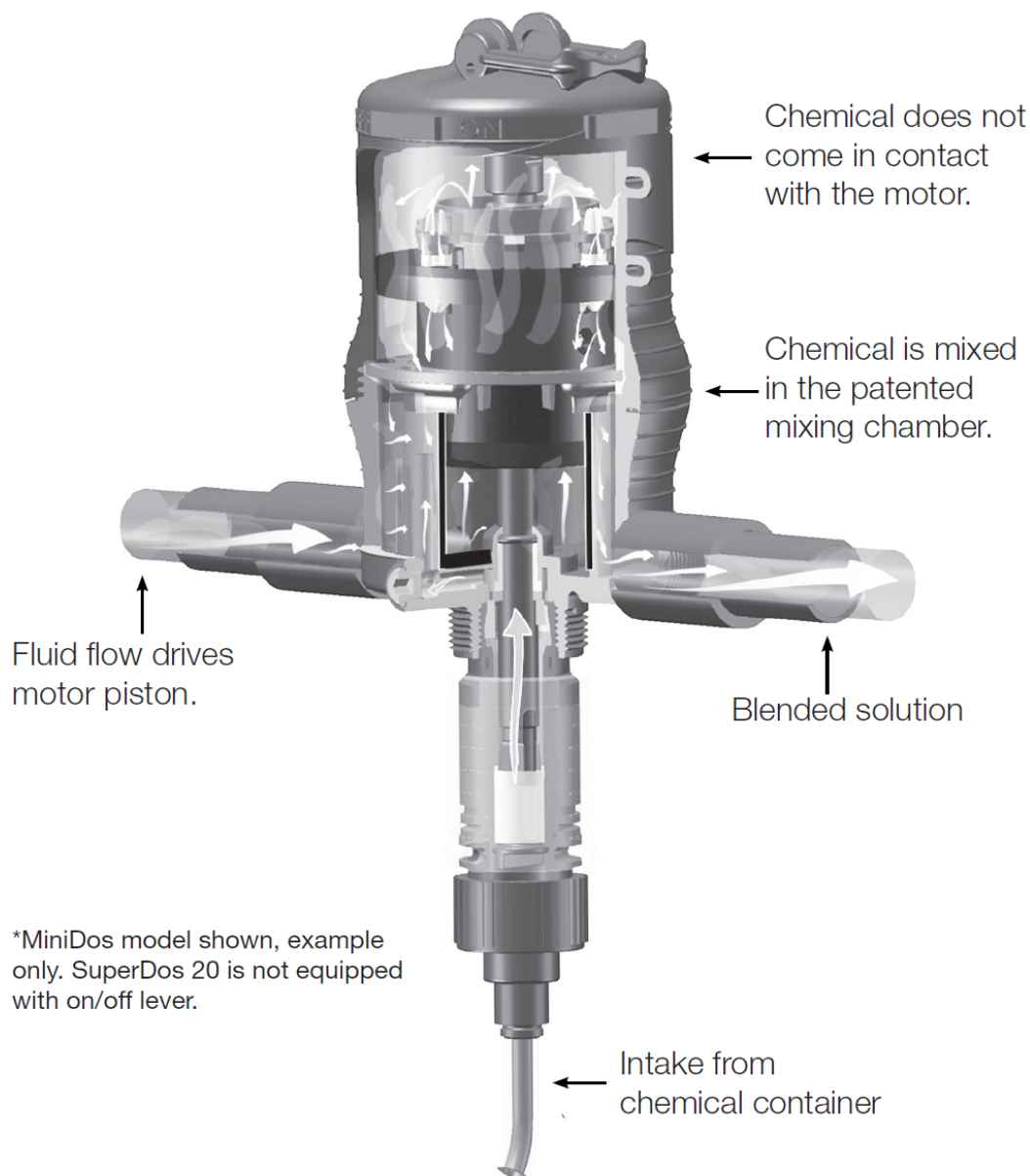
Part # 013825 Rev. I



# Operating Principle

## Accurate and Reliable

Installed directly in the fluid supply line, the injector operates without electricity, using fluid (water) pressure as the power source. The fluid drives the injector, which pulls the required percentage of concentrate directly from the chemical solution container. Inside the Hydro patented mixing chamber, the concentrate is mixed with the fluid, and the fluid pressure forces the mixed solution downstream. The amount of concentrate will be directly proportional to the volume of fluid entering the injector, regardless of variations in flow or pressure.



\*MiniDos model shown, example only. SuperDos 20 is not equipped with on/off lever.

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**Please read this manual carefully before putting the Hydro injector into operation.**

This booklet has the information you will need for the use and care of your new Hydro injector. If you have any further questions about your injector, the warranty, routine maintenance or proper usage, please contact your nearest distributor or Hydro Systems customer service.

These models are designed to inject liquid concentrate or soluble powder that are recommended and approved for injection into fluid systems.

It is the responsibility of the operator to determine the correct dosage settings of the unit using the chemical manufacturers' recommendation for dispensing their product, and to assure that proper dosage is being maintained.

**Maintenance and Warranty**

Hydro offers a three year limited warranty from the original date of purchase for manufacturing or materials defects only. With proper use and care, your injector should provide you long-term performance.

**For Your Records**

The serial number of your Hydro injector is located on the injector body. Please record this number in the space below and reference it when calling your distributor or Hydro for information, parts and service.

Serial #.....

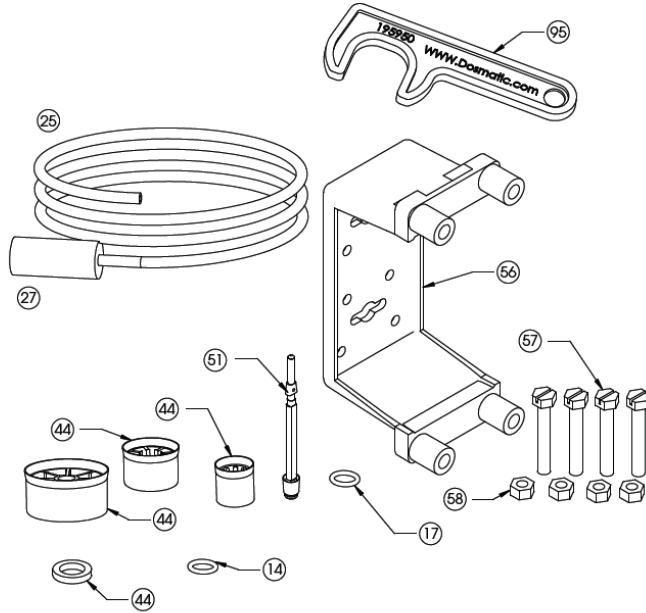
Date Purchased .....

This document does not form a contractual engagement on the part of Hydro Systems Company and is for information only. Hydro reserves the right to alter product specifications or appearance without prior notice.

# Package Contents

## The injector is packaged with the following items:

- Injector (not shown)
- Dosage Piston
- O-ring
- Manual (not shown)
- Lower End Wrench (0.3% only)
- Mounting Bracket
- Mounting Nuts and Bolts
- Filter
- Suction Tube



Model	NPT	BSP
0.3%	113228R	113728R
0.3% HAC	113228HAC	113728HAC
2.5%	113205	113705
2.5% WSP	113205WSP	113705WSP
5%	113206	113706
10%	113207	113707
10% Remote Injection	113232	113233
2.5% HAC	113205HAC	113705HAC
5% HAC	113206HAC	113706HAC

## Specifications



### SuperDos 20 gpm (100 max. psi)

Model 0.3% ..... 0.025% - 0.30% (1:4000 - 1:333)

Model 2.5% ..... 0.20% - 2.5% (1:500 - 1:40)

Model 2.5% WSP ..... 0.30% - 2.5% (1:300 - 1:40)

Model 5%\*\* ..... 0.4% - 5% (1:250 - 1:20)

Model 10%\* ..... 2% - 10% (1:50 - 1:10)

Flow Rate: ..... 0.05 - 20 gpm (11 - 4,500 lph)

Operating Pressure: .. 5 - 100 psi\*\* (0,34 - 6,9 bar)

Pipe Coupling: ..... 1" NPT/BSP

\* 10% model maximum operating pressure

is 65 psi (4,5 bar).

\*\* 5% with remote injection kit maximum operating pressure is 60 psi (4 bar).

Housing	Proprietary Engineered Composite Material
Avg. Dosing Accuracy	+/- 5% of ratio
Repeatability	+/- 3% of ratio
Maximum Temp.	100°F (38°C)
Minimum Temp.	34°F (1°C)
Maximum vertical suction of concentrate	13 Feet (3.6 Meter)
Maximum horizontal suction of concentrate	49 Feet (15 Meter)
Self-Priming	Yes
Seal Material Available: *Contact your distributor for specific chemical information	Atlas - Alkaline concentrates Viton - Acids, oils & pesticides EPDM - Alkaline concentrates Kalrez

# Safety Precautions/Warranty Compliance



**Warning:** Please read precautions thoroughly before operation. Must meet all applicable local codes and regulations.

## Remove Red Caps Prior to Installation

Your injector is 100% factory tested before delivery and may contain a small amount of water. The three red plastic caps are fitted after testing to ensure cleanliness of the injector.

## Before Applying Aggressive Chemicals

Please consult your distributor, chemical manufacturer or contact Hydro's customer service to confirm compatibility with your injector. Always wear proper safety protection as recommended by chemical supplier.

## Label all Fluid Lines, Valves and Connections

If the solution that is being injected is not suitable for drinking, all fluid lines should be labelled:  
*Warning - not for human consumption!*

## Monitor Outlet Flow

It is the user's responsibility to monitor the output of chemical injected.

## A Filter is Recommended and Required

Install a filter of 140 mesh (104 micron) or finer depending on your fluid quality to prolong the working life of the injector and for the warranty to be valid. A filter is imperative since most fluid contains impurities or particles, especially if the fluid source comes from a well, pond or lake.

## Avoid a Potentially Hazardous Chemical Accident

Select a safe location. Chemical container should be kept away from children and/or high usage areas and the location must also not be susceptible to freezing temperatures.

## Avoid Solution Contamination

Use only clean FILTERED fluid. Do not allow contaminants to enter the solution container. They can be pumped into the fluid line and may cause the spread of disease. Dirt, debris and other contaminants in the solution container may cause excessive wear to the unit.

## Fluid Temperature

Min: 34°F (1°C), Max: 100°F (38°C)

## Maximum Fluid Pressure

0.3%, 2.5%, 5%, - 100 psi (6,9 bar)

10% - 65 psi (4,5 bar)

5% model with remote injection kit has maximum operating pressure of 60 psi (4 bar).

Install a pressure regulator and/or pressure relief valve to ensure operating pressure does not exceed the maximum specification.

## Before Removing An Injector From The System

Release fluid pressure. While the system is in operation, turn off the incoming fluid valve. Leave the out going valve open. This will relieve the pressure at the injector and all parts of the system after the injector. Injector is now safe to remove.

## General Tips

Please read this instruction manual thoroughly. Following the procedures, will increase the life of your injector.

## For A Long Service Life

Start with clean fluid by using an inline filter to reduce impurities. Keep the solution container covered and clean. Keep the suction tube filter 2" (5 cm) from the bottom of the container. Perform maintenance procedures as recommended (see Maintenance page 10).

## Soluble Powder Use

Ensure the chemical is completely dissolved before starting the injector. If necessary, dissolve the chemical in hot water and allow to cool before using. Failure to thoroughly dissolve the chemical will cause premature wear to the dosage piston and the inner cylinder.

## Keep From Extreme Temperature

Protect the injector from freezing temperatures or excessive heat.

## Rinse Injector After Each Use

Additive allowed to remain in injector can dry out, foul or damage the lower end at the next start-up (see Maintenance page 10).

## Injector Not in Use for an Extended Period

If the injector has not been stored properly deposits may have dried onto the motor (see Maintenance page 10). Before operation, soak entire unit into room temperature water approx. 72°F (22°C) for an eight hour period.

# Operations

## Clicking Sound is Normal

Fluid flowing through the injector will automatically cause the injector to “click” and inject a set amount of solution into the fluid line. The higher the flow rate the more frequent the “clicking”. The injector is designed to inject solution proportionally (at the same set ratio) regardless of fluid flow.

## Service Fluid Flow

Fluid flow and pressure must be within the established specifications (see Specification on page 6) for your model.

## Change Feed (Injection) Rate

The feed rate on the injector is adjustable EVEN WHILE OPERATING AND UNDER PRESSURE. To change feed rate see (Fig. 1 and Fig. 2). Do not remove #79 when injector is under pressure.

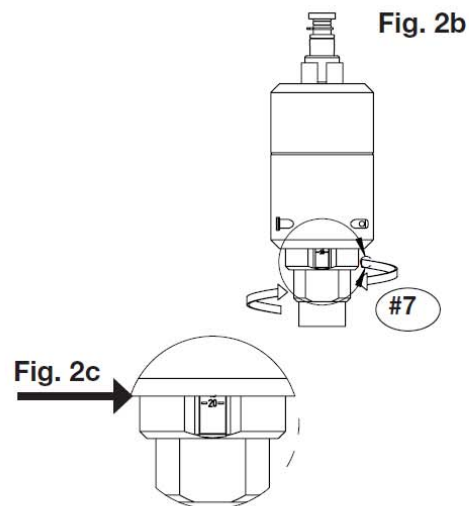
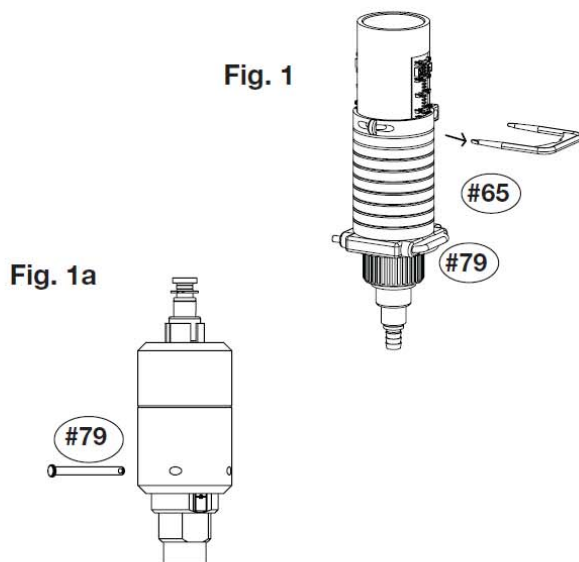
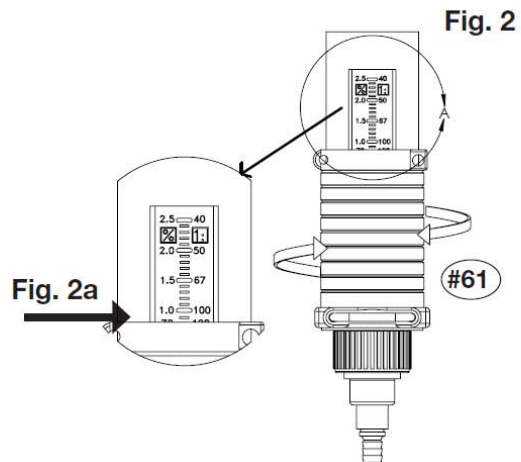
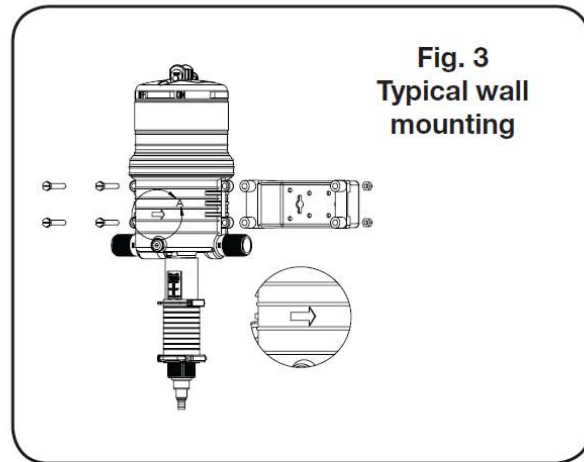
### SuperDos 20 0.3%, 2.5% 5%

1. Remove Upper Interlock Pin (#65) (Fig. 1).
2. Rotate Ratio Adjuster Sleeve (#61) up or down to the desired setting (Fig. 2). Use the top of the Ratio Adjuster Sleeve to line up with the desired feed rate on the setting (Fig. 2a).
3. Re-insert Upper Interlock Pin (#65). Clip must be parallel with settings to be able to re-insert.

### SuperDos 20 10%

1. Remove Ratio Locking Pin (#79) (Fig. 1a).
2. Rotate Outer Cylinder (#7) up or down to the desired setting (Fig. 2b). Use the bottom of the Ratio Adjuster to line up with the desired feed rate setting (Fig. 2c)

NOTE: Do not screw Ratio Adjuster Sleeve below lowest setting line. Measure outlet fluid to assure desired feed rate is being delivered.





# Installation & Start-up Refer to Fig. 3 and Fig. 4

## Fluid Filter (Required)

Install a filter of 140 mesh (104 micron) or finer depending on your fluid quality to prolong the working life of the injector and for the warranty to be valid. Hydro recommends a Twist II Clean® filter that can be ordered with your injector.

## Mounting Injector

Securely fasten your injector to a solid object such as a wall or in a cold fluid line. Note arrow on injector indicates fluid flow.

## Backflow Preventor (Recommended)

Install one that meets local code requirements.

## Pressure Safety Release Device (Recommended)

Prevents pressure from exceeding specifications of the unit.

## Bypass Valve Set-up (Recommended)

Allows the injector to be taken off-line for maintenance or storage when not in use.

## Fluid-Hammer Arrester (Recommended)

Prevents fluid-hammer damage to the injector when operating quick closing solenoid, pneumatic or hand-operated ball valves on the fluid system.

## Anti-Siphon Valve (Optional)

To prevent solution from being siphoned out (from the solution container) into the feed lines when the upstream valve is shut off. The anti-siphon valve must be installed on the downstream outlet.

## Additional Siphoning Prevention

Place solution container on a level below the injector suction tube fitting. Using the inlet side as a shut-off valve could cause full strength solution to siphon into the feed line.


## Solution Container

Use any size container. A lid or cover is recommended. To connect your solution container, gently push the end of the suction tube onto the bottom of the suction tube fitting assembly. Place the filter into the solution container at least 2" (5 cm) from the bottom and fill with at least 2" (5 cm) of chemical solution.

## Never Use Petroleum Based Lubricants

The injector is shipped with a thin coat of silicone around the seals for ease-of-assembly. Petroleum based lubricants such as Vaseline®, baby oil, WD40®, or motor oil on the O-rings or any part of the injector should never be used as this can cause particles to adhere and clog or damage the injector.

## Check System for Leaks and Start-Up Procedures

 Open the bypass valve (A), close inlet valve (B) and outlet valve (C) to prevent fluid flow into the injector. SLOWLY turn on the main fluid line. Run fluid flows between 5 - 12 gpm (11-45 l/m) through the plumbing system. Turn on all of the valves located downstream from your injector to release trapped air. SLOWLY turn on the inlet valve (B). Open the outlet valve (C) and close valve (A). As fluid travels through the injector, you will hear a "clicking" sound. Check for leaks and correct if necessary.

Suggested Installation Diagram

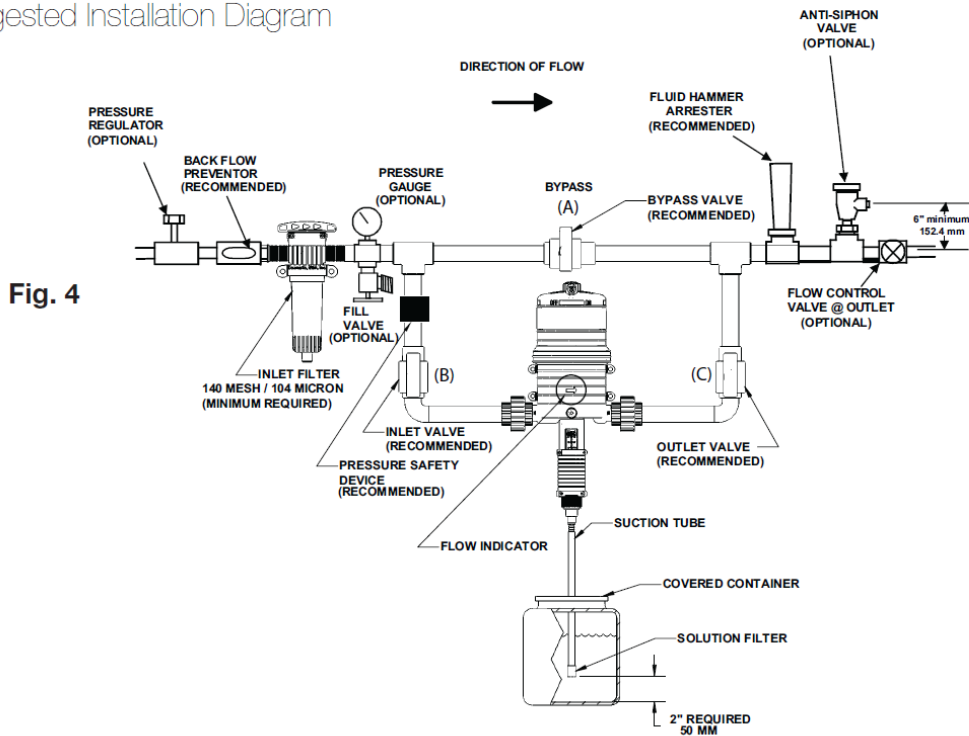
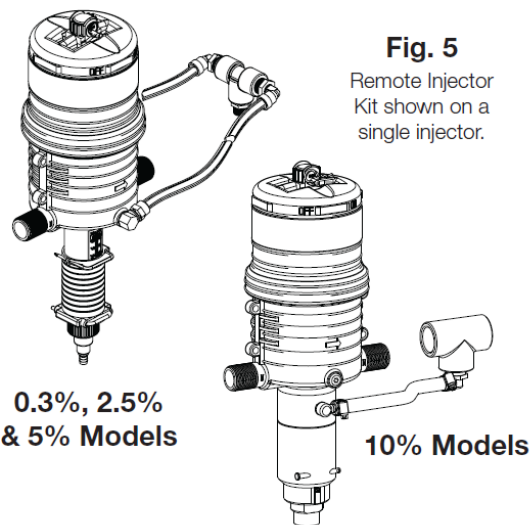


Fig. 4

# Remote Injecting



**Fig. 5**  
Remote Injector  
Kit shown on a  
single injector.

**Remote Injector Kit (not included)**  
Is recommended for the following:

Kit Part Numbers  
012705

**Single Injector:**

To prevent mineral build-up within the body of the unit use when injecting chemicals that cause minerals to precipitate from fluid (see Fig. 5).

NOTE: When mixing more than one chemical, always refer to your chemical manufacturer information guide for proper application. Contact your local distributor or Hydro customer service for information or to order.

## Maintenance

Reference numbers refer to pages 14 - 20

### Rinse Injector After Each Use

Additive allowed to remain in injector can dry, foul or damage the lower end at the next start-up. Place suction tube into a 1 qt. (0.95 liters) or more container of fresh filtered water. Flow fresh water through the injector by operating until container is empty. This procedure is not needed for continuous operation.

### Clean Solution Container

Keep covered to prevent dirt, debris from entering the container. Rinse container thoroughly and often. Do not mix chemicals together that might react and cause a precipitate. Use FILTERED fluid when filling container.

### Clean Suction Tube Filter Screen

Inspect each time new solution is added. Clean filter screen (#27) and suction tube (#25) as necessary by rinsing in fresh water. Replace if necessary. Keep filter screen off bottom of solution container to prevent dirt and precipitate from clogging filter.

### Clean Inlet Filter

Clean or replace inlet filter as required to increase the life of the unit as well as reduce pressure loss.

### Bypass Injector

When not in use place the injector in bypass mode by using the three valve bypass.

### Storage

For extended storage, rinse injector (see "Rinse Injector After Each Use") and place underwater in a container. Apply monthly, <0.1 oz. (29 ml) of chlorine bleach to avoid algae growth. KEEP FROM FREEZING.

Perform these maintenance procedures to extend the life of your unit.

### Refer to page 15 & 16 SuperDos 20 (0.3%) Model

Every 3 - 6 Months	Every 6 - 12 months	Replace as necessary
1. Clean seal areas (#13). 2. Check #17 O-ring, #68 Cylinder, clean and/or replace as necessary.	1. Replace #17 O-ring and #51 Dosage Piston Shaft Assembly. 2. Clean and/or replace #13 Check Poppet, #11 Suction Tube Fitting.	1. #68 Cylinder 2. #51 Shaft Assembly

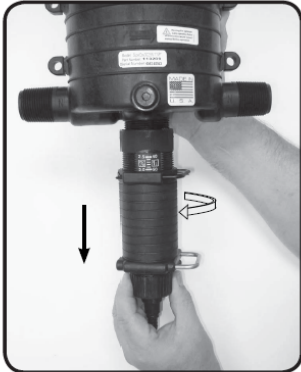
### Refer to page 17, 18 & 19 SuperDos 20 (2.5%), (5%) Models

Every 3 - 6 Months	Every 6 - 12 months	Replace as necessary
1. Clean seal areas (#14 & #13, #44 - WSP). 2. Check #17 O-ring, #7 Cylinder, clean and/or replace as necessary.	1. Replace #17 O-ring and #44 Dosage Piston/gasket (WSP model). 2. Clean & inspect #13 Check Poppet, #11 Suction Tube Fitting.	1. #7 Cylinder 2. #14 (#44 - WSP) O-ring

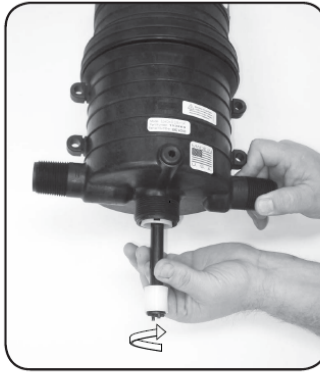
### Refer to page 20 SuperDos 20 (10%) Models

Every 3 - 6 Months	Every 6 - 12 months	Replace as necessary
1. Clean seal areas (#14). 2. Check #17 O-ring, #7 Cylinder, clean and/or replace as necessary.	1. Replace #17 O-ring and #44 Dosage Piston. Clean and/or replace. 2. Replace #60 hose kit.	1. #7 Cylinder 2. #14 O-ring

# Routine Maintenance Instructions 0.3%, 2.5%, 5%



**Step 1.**  
Unscrew LOWER END CYLINDER ASSEMBLY from body. Remove LOWER END CYLINDER ASSEMBLY



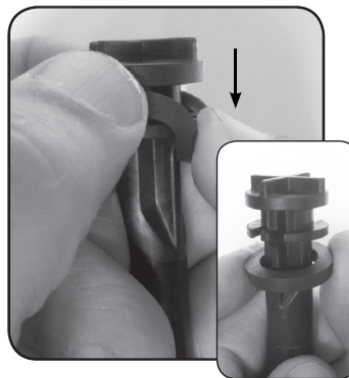
**Step 2.**  
Rotate #51 SHAFT 90° and pull from body.



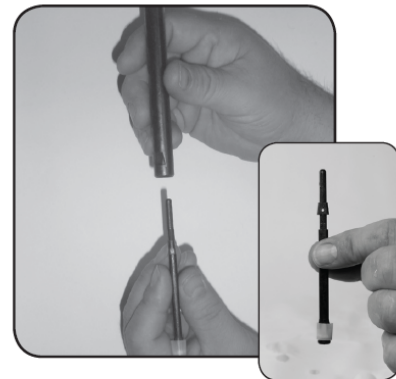
**Step 3.**  
Pry the #15 SEAL RETAINER from the injector. Pry #17 O-RING from the unit. NOTE: O-ring may still be seated at the base of the unit.



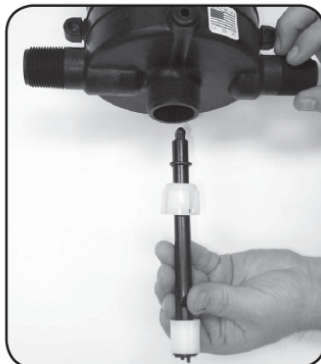
**Step 4.** For 2.5% & 5%  
Replace #44 DOSAGE PISTON flared-end up and #14 O-RING.



**Step 5.** For 2.5% WSP  
Pinch and pull #44 DOSAGE GASKET over the retainer lip. Slide off the #51 shaft assembly.



**Step 5a.** For 0.3%.  
Replace LOWER SHAFT ASSEMBLY #51 into upper shaft.



**Step 6.**  
Reinsert #15 SEAL RETAINER and #17 O-RING onto # 51 SHAFT ASSEMBLY.



**Step 7.**  
Reinsert #51 SHAFT ASSEMBLY into body and rotate 90° to lock. Confirm the shaft is locked in by gently tugging on the shaft. Shaft should remain inserted.



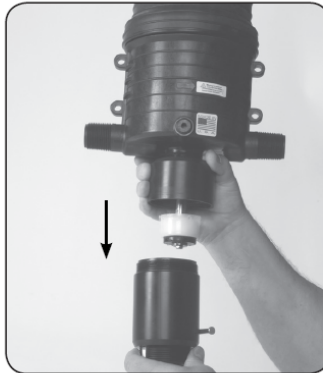
**Step 8.**  
Screw LOWER END CYLINDER ASSEMBLY onto body. Ensure #16 gasket is seated on the top of cylinder assembly.



# Routine Maintenance Instructions 10%



Step 1.  
Unscrew LOWER END ASSEMBLY from body.



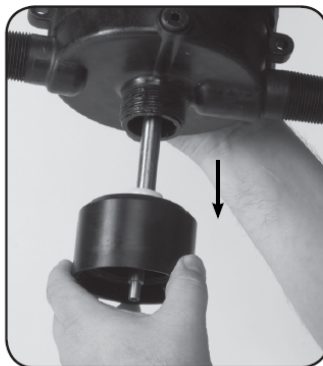
Step 2.  
Remove LOWER END ASSEMBLY.



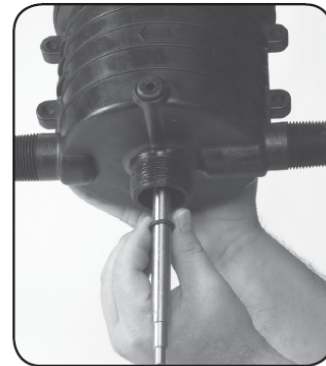
Step 3.  
Remove #93 CAPSCREW from the end of the shaft using a wrench and nut driver.



Step 4.  
Remove the #73 DOSAGE PISTON GUIDE and replace #44 DOSAGE PISTON and #14 O-ring.



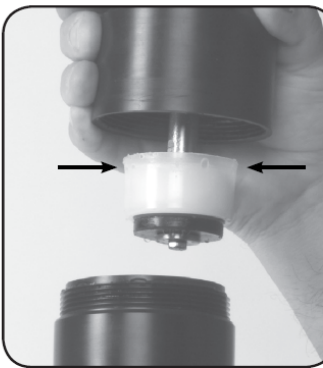
Step 5. Unscrew #72 ADAPTER and remove.



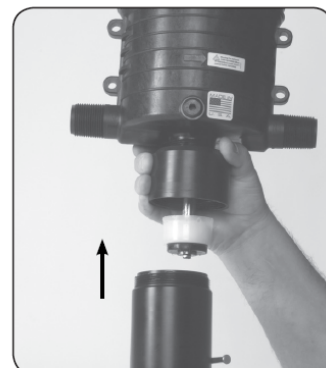
Step 6.  
Remove and replace #17 O-RING.



Step 7.  
Re-install the new #44 DOSAGE PISTON and #73 DOSAGE PISTON GUIDE. Tighten snug using a nut driver.



Step 7a.  
NOTE: #44 DOSAGE PISTON must be installed flared end up.



Step 8.  
Screw LOWER END ASSEMBLY onto body. Hand-tighten only.

# Troubleshooting

## New Install - Always Pressure Up Slowly (Follow start up on page 9)

Problem	Cause	Solution
No Clicking Sound	Fluid not flowing through system	Are the red plugs at the inlet, outlet and suction tube fitting openings removed? Is the unit installed backward? The arrow on the unit must point in the direction of the fluid flow. If still not clicking, do not open the upper body. Call Hydro Customer Service.
	Fluid flowing through system	Fluid rate is below or exceeds rated service flow of injector. (see Specifications page 6). Has the new injector been stored for an extended period? If so, submerge the injector in room temperature fluid for 24 hours so that the working parts can re-absorb fluid and swell back to the proper size. If below, increase flow rate. If above, reduce flow rate. Operating pressure exceeds maximum limit. Install a pressure reducer valve. (see Specifications page 6). By-pass valve (A page 9) not closed. Check and set valve to the OFF position.

## Injector in Operation or After Scheduled Maintenance

Problem	Cause	Solution
No Clicking Sound	Main Piston Assembly #9 worn	Replace # 9 Main Piston Assembly. Clean fluid filter.
	Cover #1 or main body #40 worn or scored	Replace and install or clean fluid filter.
	By-Pass Valve (A) not closed	Set By-pass valve (A) to the closed position.
	Dirty or plugged inlet filter	Ensure mesh size is correct for proper filtration. Clean filter.
	#17 Worn or not seated properly	Re-seat #17 or replace.
Clicking Sound No Suction of Solution	Cylinders #7 or #68 worn.	Replace.
	Dosage piston/gasket (WSP model) #44 (0.3% model #51) worn or installed incorrectly	Replace. Ensure during maintenance replacement that #44 was installed correctly flared-end up.
	O-ring retainer #15 installed incorrectly	Install correctly.
	O-ring seat #14 or dosage piston/gasket #44 (0.3% model #51) damaged	Replace.
	#17 O-ring worn and/or loose	Replace.
	Suction tube #25 or suction tube fitting #11 cracked, leaking or clogged suction tube filter	Replace and/or clean as necessary.
	Check valve #13 leaking	Clean & replace as necessary.
Clicking Sound. Under Injecting	#44 (0.3% model #51) Dosage Piston/gasket (WSP model) worn	Replace.
	#7 (#68 - 0.3%) Inner Cylinder worn	Replace.
	Unit operates at high-flow and not at low flow	Replace #17 O-ring.
	Main Piston Assembly #9 worn	Replace # 9 Main Piston Assembly. Clean fluid filter.
	Cover #1 or main body #40 worn or scored	Replace and install or clean fluid filter.
Fluid Re-filling Solution Tank	Check valve #13 leaking	Check seat area on suction tube fitting #11. Check valve and seal must fit loose in the suction tube fitting. Clean seal and inside fitting for debris.
	Washer seal on #13 is swollen or chemical attack	Replace with new check valve assembly.

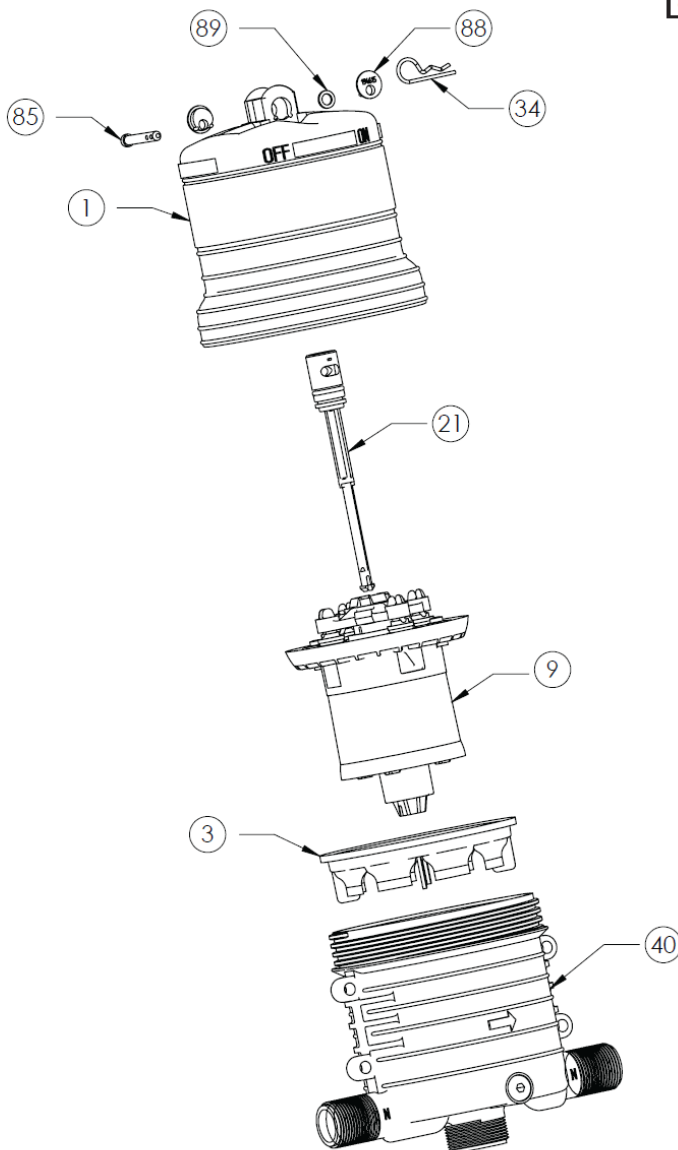
# Kits & Spare Parts List

Injector Repair Parts .....	15
0.3% HAC Rotating: .....	16
0.3% Rotating: .....	17
2.5%: .....	18
2.5% WSP:.....	19
5%: .....	20
10%: .....	21
Accessories:.....	22

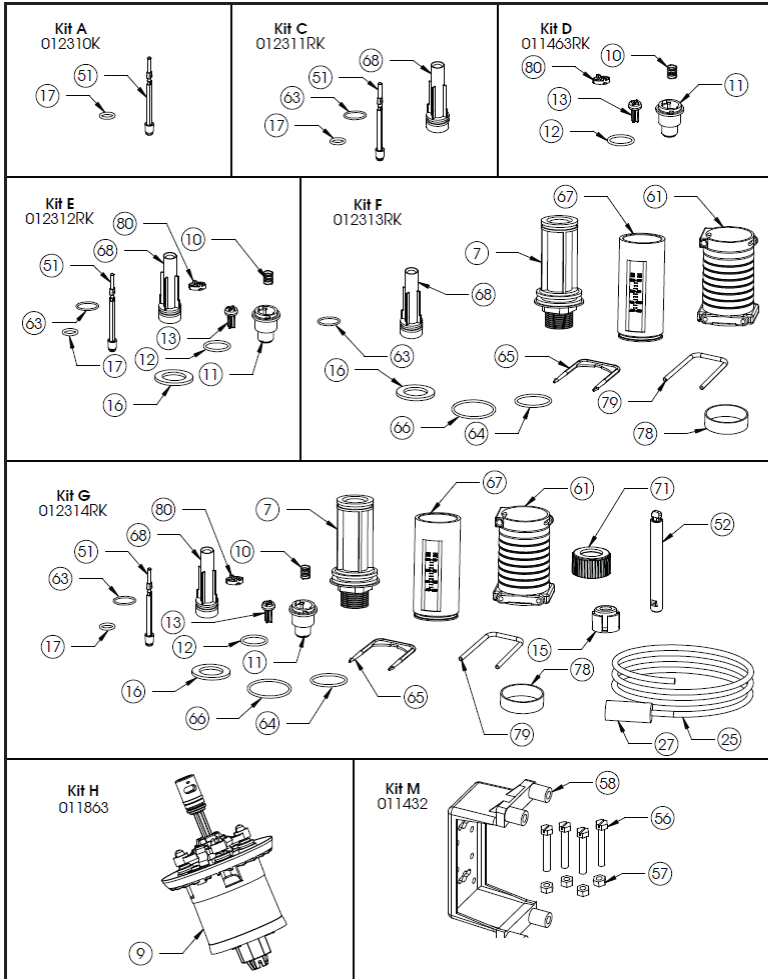


# Injector Repair Parts

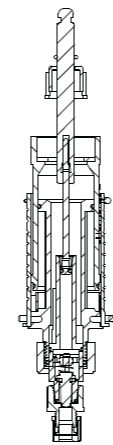
Ref. #	Description
1	Upper Body (Must Order w/#88)
3	Mixing Chamber Gasket
9	Piston Assembly (Must Order With #21)
9	Piston Assembly 10% (Must Order With #21)
21	Shaft Assembly
34	Hairpin
40	Lower Body NPT 1"
40	Lower Body BSP 1"
85	Upper Shaft Pin
88	Non Bypass Plug
89	Washer



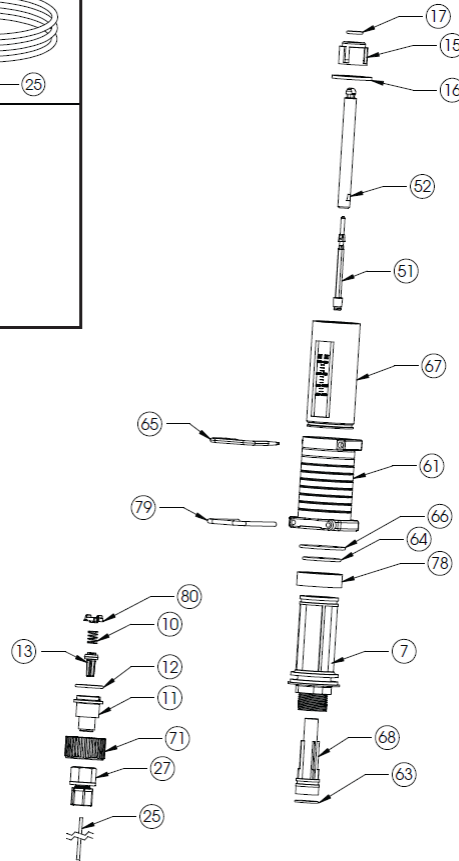
# 0.3% HAC Rotating



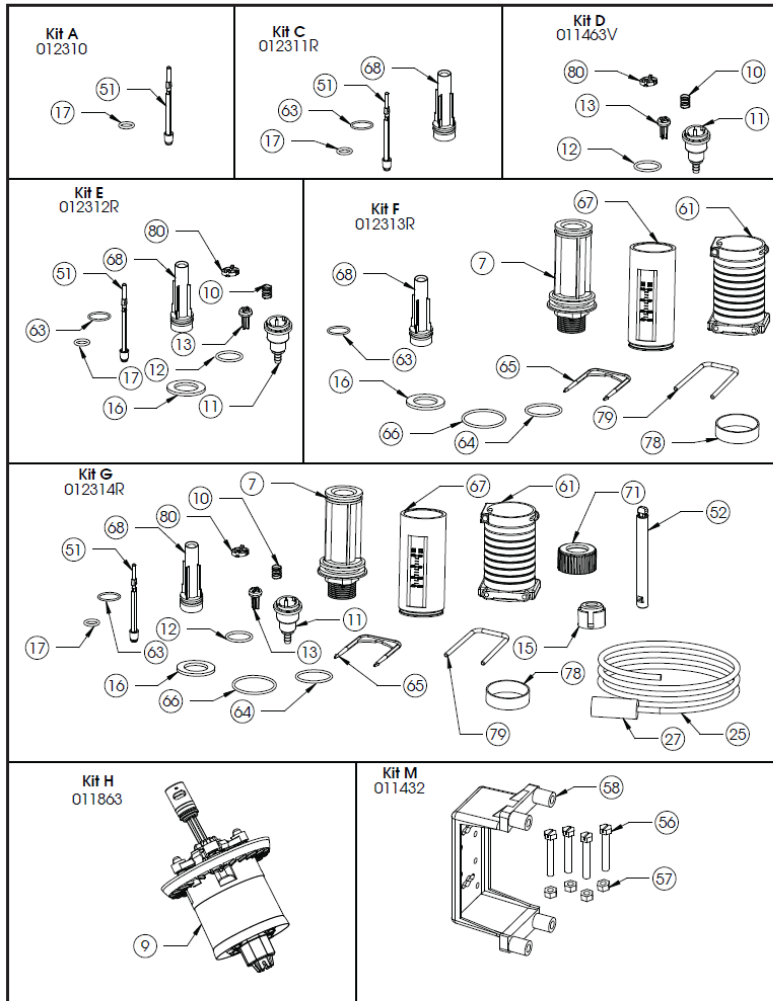
Manual Reference	Description of Part
7	Cylinder, inner
10	Spring
11	Suction tube fitting
12	O-ring
13	Check poppet
15	Seal retainer, O-ring
16	Lower End Gasket
17	O-ring
25	Suction tube, 1/4" ID x 5 ft
27	Compression fitting
51	Lower shaft Assy
52	Upper shaft
61	Ratio adjustment sleeve
63	O-ring
64	O-ring, inner cylinder, lower end
65	Pin, upper interlock
66	O-ring, outer cylinder, lower end
67	Cylinder, outer
68	Cylinder, inner for #7
71	Nut, suction tube fitting
78	Lower end stop
79	Pin, narrow interlock
80	Twistlock



Lower End Assembly

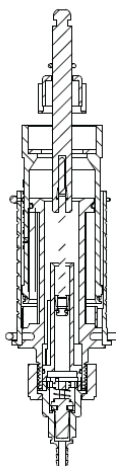


# 0.3% Rotating

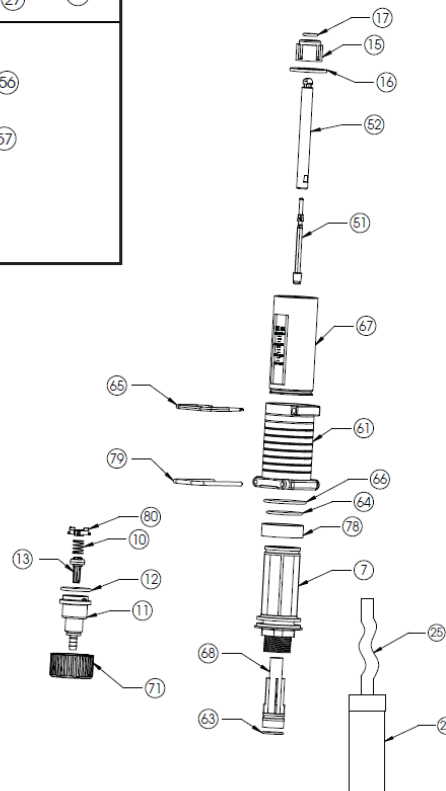


Manual Reference	Description of Part
7	Cylinder, inner
10	Spring
11	Fitting, suction tube, 1/4"
12	O-ring
13	Check poppet
15	Seal retainer, O-ring
16	Lower End Gasket
17	O-ring
25	Suction tube, 1/4" x 5'
27	Foot valve 1/4" ID
51	Lower shaft assy.
52	Upper shaft
61	Ratio adjustment sleeve
63	O-ring, inner cylinder (#68)
64	O-ring, inner cylinder, lower end
65	Pin, upper interlock
66	O-ring, outer cylinder, lower end
67	Cylinder, outer
68	Cylinder, inner for #7
71	Nut, suction tube fitting
78	Lower end stop
79	Pin, narrow interlock
80	Twistlock

**Note:** Viton seal materials are standard. Other seal materials are available.

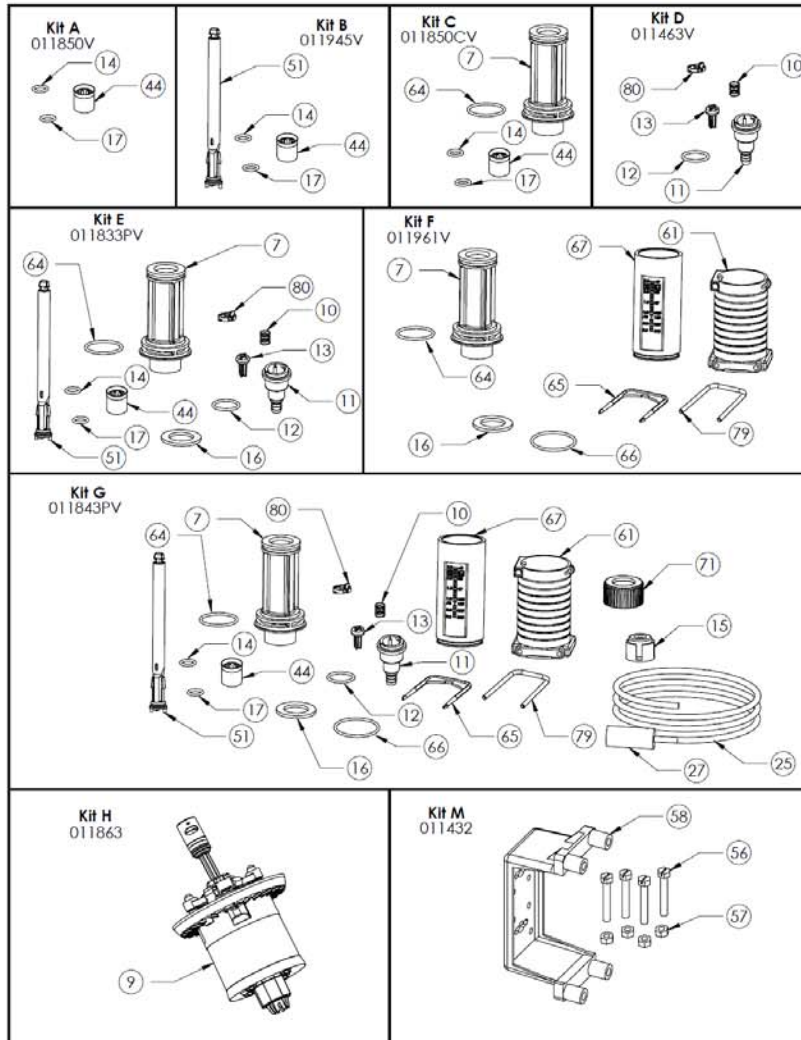


Lower End Assembly



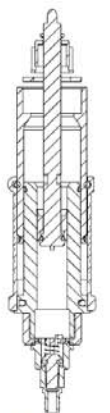


# 2.5%

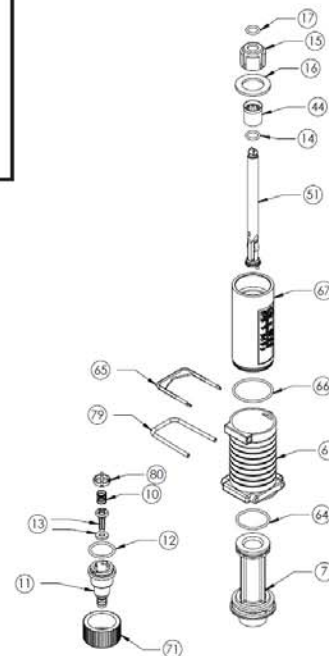
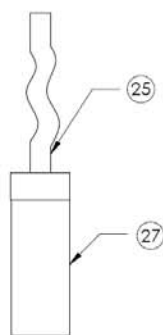


Manual Reference	Description of Part
7	Cylinder, inner
10	Spring
11	Fitting, suction tube, 1/4"
12	O-ring
13	Check poppet
14	O-ring
15	Seal retainer, O-ring
16	Lower End Gasket
17	O-ring
25	Suction tube, 1/4" x 5'
27	Filter, for suction tube, 1/4" ID
44	Dosage Piston
51	Shaft
61	Ratio adjustment sleeve
64	O-ring, inner cylinder, lower end
65	Pin, upper interlock
66	O-ring, outer cylinder, lower end
67	Cylinder, outer
71	Nut, suction tube fitting
79	Pin, narrow interlock
80	Twistlock

**Note:** Viton seal materials are standard. Other seal materials are available.

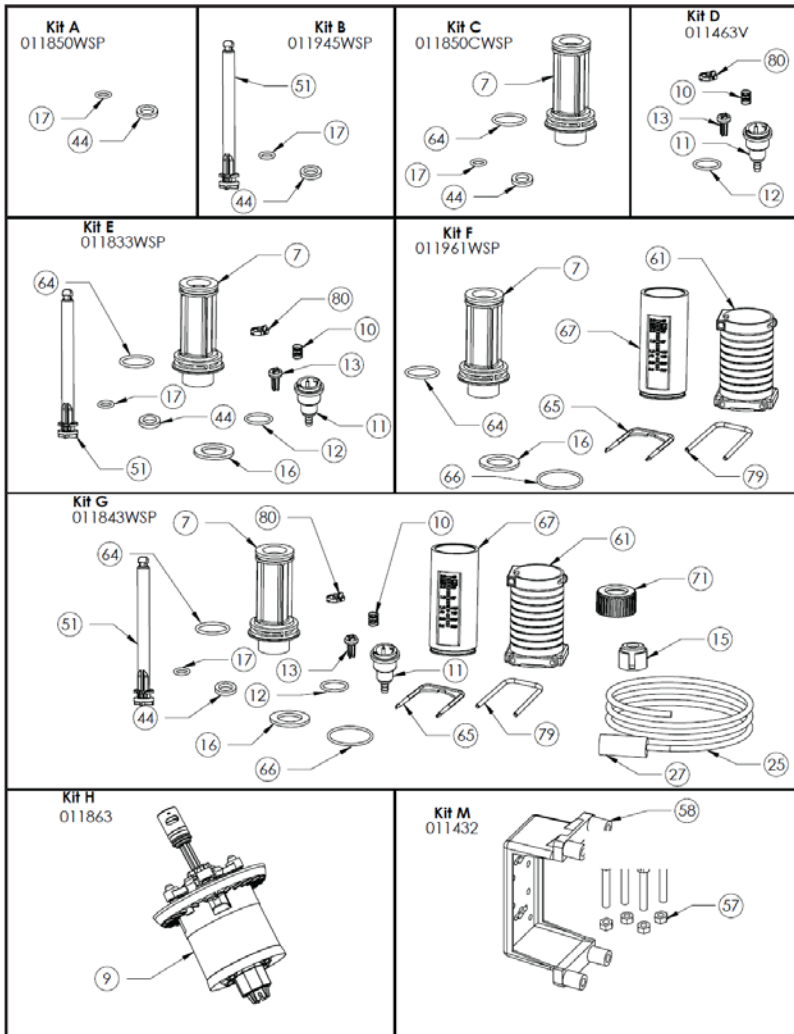


Lower End Assembly

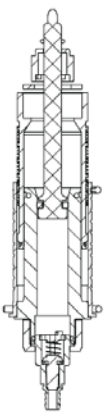


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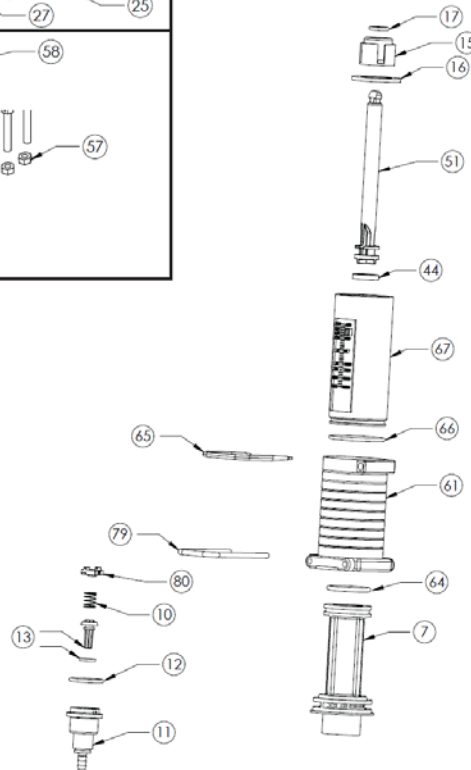
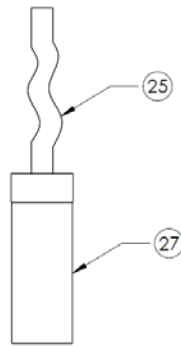
# 2.5% WSP



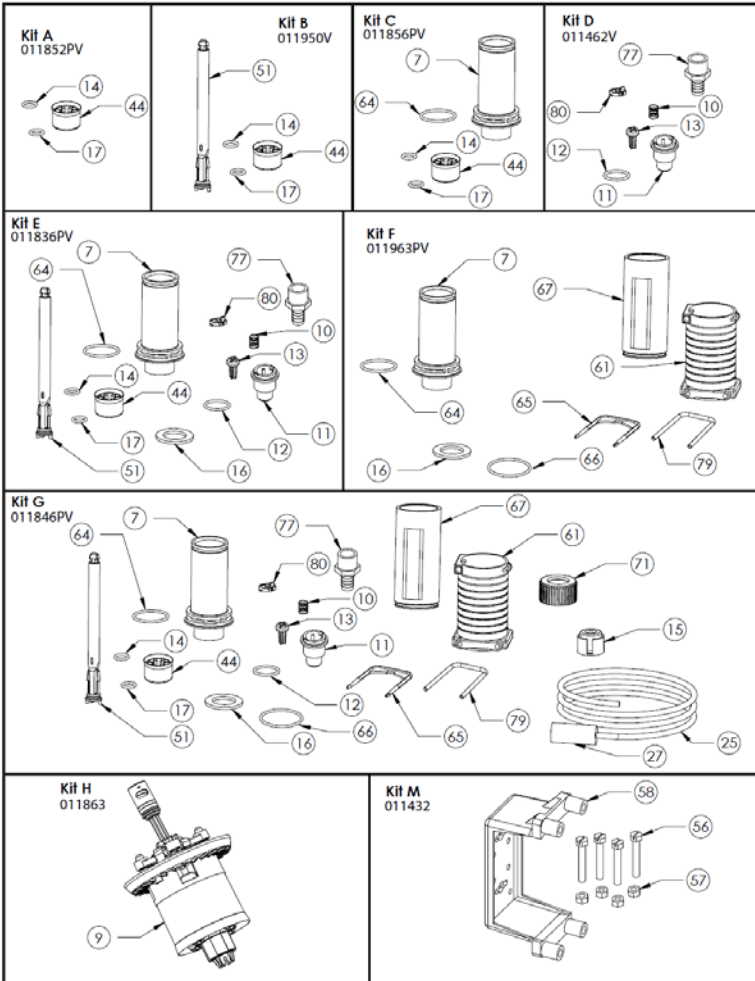
Manual Reference	Description of Part
7	Cylinder, inner
10	Spring
11	Fitting, suction tube, 1/4"
12	O-ring
13	Check poppet
15	Seal retainer, O-ring
16	Lower End Gasket
17	O-ring
25	Suction tube, 1/4" x 5'
27	Filter, for suction tube, 1/4" ID
44	Dosage Gasket
51	Shaft
61	Ratio adjustment sleeve
64	O-ring, inner cylinder, lower end
65	Pin, upper interlock
66	O-ring, outer cylinder, lower end
67	Cylinder, outer
71	Nut, suction tube fitting
79	Pin, narrow interlock
80	Twistlock



Lower End Assembly

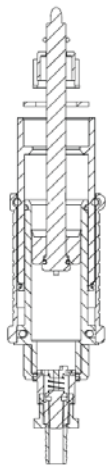


5%

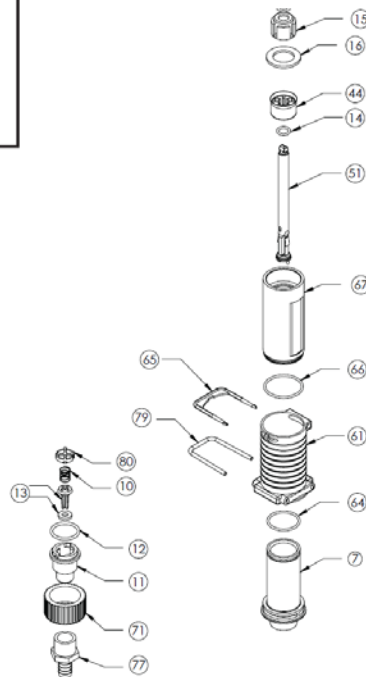
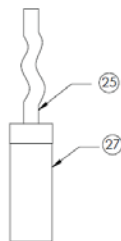


Manual Reference	Description of Part
7	Cylinder, inner
10	Spring
11	Suction Tube Fitting
12	O-ring
13	Check Poppet
14	O-ring
15	Seal retainer, O-ring
16	Lower End Gasket
17	O-ring
25	Suction tube, 1/2" x 5'
27	Filter, for suction tube, 1/2" ID
44	Dosage Piston
51	Shaft
61	Ratio adjustment sleeve
64	O-ring, inner cylinder, lower end
65	Pin, upper interlock
66	O-ring, outer cylinder, lower end
67	Cylinder, outer
71	Nut, suction tube fitting
77	Hose Barb 1/2" x 3/8"
79	Pin, narrow interlock
80	Twistlock

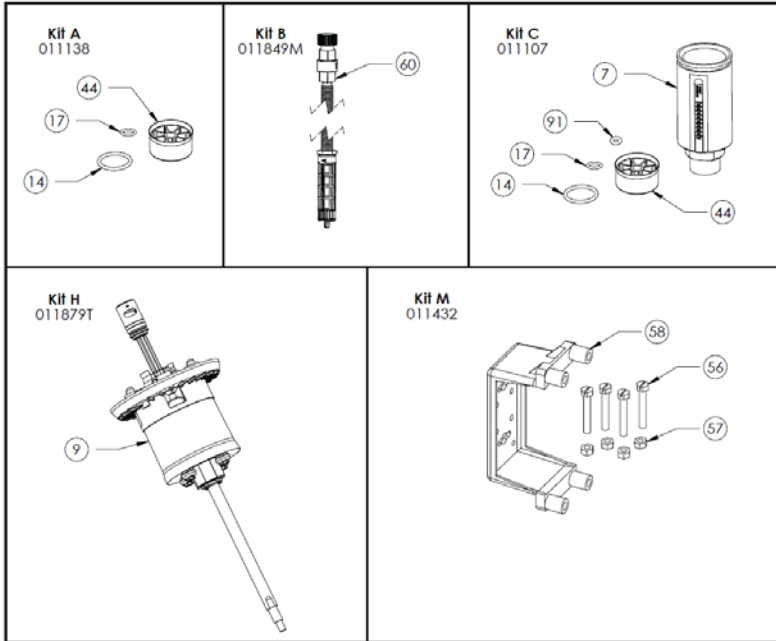
**Note:** Viton seal materials are standard. Other seal materials are available.



Lower End Assembly

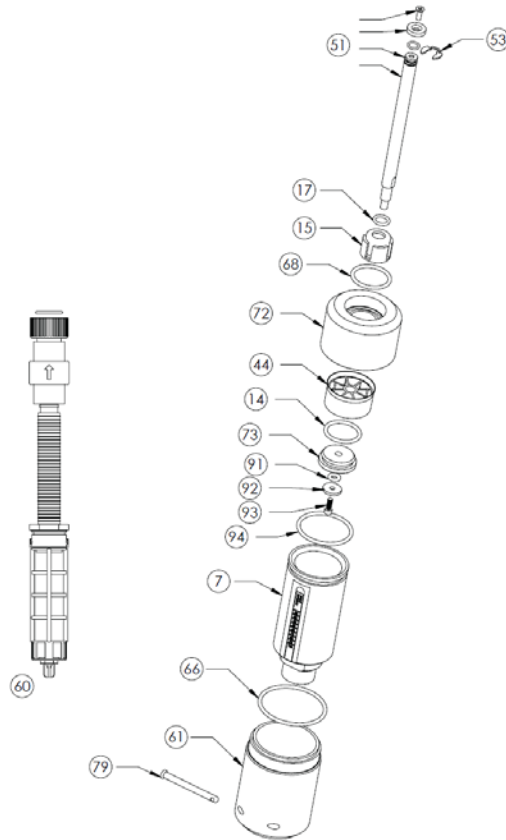
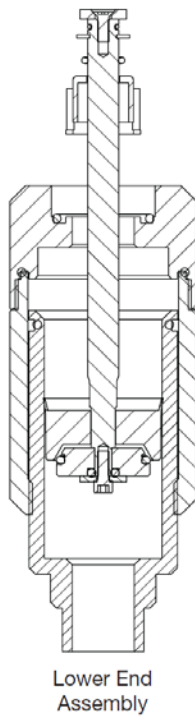


# 10%



Manual Reference	Description of Part
7	Outer Cylinder
14	O-ring, Dosage Piston Guide
15	Seal Retainer, O-ring
17	O-ring
44	Dosage Piston
51	Shaft Assembly, Stainless Steel
53	Kilpring
61	Ratio Adjuster
66	O-ring, Outer Cylinder, Lower End
68	O-ring, Cylinder Adapter, Lower End
72	Adapter
73	Dosage Piston Guide
79	Ratio Locking Pin
93	Capscrew 10-32 X 1/2" Ss Hex
92	Shaft Cap
94	O-ring, Outer Cylinder
91	O-ring, Dosage Piston Guide
60	Hose Kit

**Note:** Viton seal materials are standard. Other seal materials are available.



# Accessories



**Twist II Clean Inline Filter®**

**Available In:**

- 3/4" - 25 gpm (95 l/mn) 100 psi (7 bar)
  - 1" - 39 gpm (114 l/mn) 100 psi (7 bar)
  - 1.5" - 78 gpm (295 l/mn) 100 psi (7 bar)
  - 2" - 150 gpm (568 l/mn) 100 psi (7 bar)
- \* Various mesh sizes available.



**Mobile Cart**



**North America** 3798 Round Bottom Road, Cincinnati, Ohio, 45244 **Phone** 513.271.8800 **Toll Free** 800.543.7184 **Fax** 513.271.0160 **Web** [hydro-systems.com](http://hydro-systems.com)  
**Europe** Unit 3 The Sterling Centre, Eastern Road, Bracknell, Berkshire, RG12 2PW **Phone** +44 (0)1344 488880 **Fax** +44 (0)1344 488879 **Web** [hydro-systems-europe.com](http://hydro-systems-europe.com)  
**South America** Rua Mogiana, 172 Chácara Ranidas, São José Dos Campos, 12238-420SP, Brasil **Phone** +55 12 3201 7707 **Web** [hidronovabrasil.com](http://hidronovabrasil.com)  
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**Asia Pacific** Block #B, No. 51, Mindong Road, Pudong New Area, Shanghai, PRC 201209 **Phone** +86 21 61871037 **Fax** +86 21 68727775