



Direct Injection System Series 6000

Instruction Manual

All Hydro Instruments Chlorination systems are carefully designed and tested for years of safe, accurate field service. All Hydro Instruments Chlorination systems are tested, at customer specified conditions, prior to shipment. All Hydro Instruments products are made of the finest materials.

To insure best operation, read these instructions carefully and completely and store them where all maintenance personnel will have access to them.

Each chlorination system consists of the following:

1. The chlorine gas pressure regulator, with pressure relief valve, gas flowmeter and vent system, mounts on the chlorine cylinder.
2. The chlorine gas exhaust valve which mounts in the gas line between the pressure regulator and the check valve-diffuser assembly.
3. The chlorine gas check valve-diffuser, which could be a perforated tube type connecting to a pipeline.
4. Standard accessories:
 - a. Twenty-five feet of appropriate polyethylene tubing
 - b. Twelve lead gaskets for chlorinator to cylinder valve
 - c. Multi-purpose wrench

The information contained in this manual was current at the time of printing. The most current versions of all Hydro Instruments manuals can be found on our website: www.hydroinstruments.com

Direct Injection System Series 6000 Operation & Maintenance Manual

Table of Contents

I. SAFETY INFORMATION.....	3
II. DESIGN AND INSTALLATION NOTES.....	3
III. SYSTEM INSTALLATION	4
1. Gas Cylinder.....	4
2. Installation of Pressure Regulator	4
3. Adjustment of Regulating Pressure	5
4. Installation of Exhaust Valve.....	6
5. Installation of Check Valve-Diffuser Assembly	6
6. Connecting Lines Among Pressure Regulator, Exhaust Valve and Check Valve-Diffuser Assembly	6
IV. START UP OF CHLORINATION	6
V. CHLORINATION SYSTEM TEST	7
VI. SHUT DOWN PROCEDURE	7
VII. RATE VALVE OPERATION	7
VIII. TROUBLESHOOTING	8
APPENDIX: SERVICING THE SYSTEM	
A-I. PRESSURE REGULATOR	10
A-II. CHECK VALVE-DIFFUSER ASSEMBLY	11
A-III. FLOW METER ASSEMBLY	12
FIGURES	
1. Installation Diagram.....	4
2. Pressure Gauge.....	5
DRAWINGS	
1. Pressure Regulator.....	13-14
2. Check Valve-Diffuser Assembly.....	15-20

SECTION I: SAFETY INFORMATION

TAKE CARE WITH CHLORINE!

1. Always keep chlorine cylinders in an upright position with the valve cap screwed on tight before moving full or empty cylinders. Cylinders should be moved with care.
2. A safety chain must be placed around the cylinder and secured to a wall. Spare full cylinders should also be secured carefully.
3. For best operation and safety, the **chlorinator and cylinders should be protected from the elements including direct sunlight.**
4. **Never** place heaters or heat lamps directly on a cylinder.
5. **Ammonia gas should NOT be stored or fed in the same room with chlorine.** Contact of the gases may result in an explosive mixture.
6. Locate cylinders where they will not be bumped or damaged.
7. Never reuse the lead gasket at the yoke/gas valve pressure connection.
8. When the pressure regulator is mounted directly on the gas cylinder valve, the cylinder and pressure regulator need not be located in a heated room. For outdoor installations when temperature exceeds 100° F (38° C), the cylinder should be shaded from direct sunlight.

SECTION II: DESIGN AND INSTALLATION NOTES

1. The pressure feeding system is designed for systems in which there is a lack of electric power to operate a booster pump or sufficient inlet water pressure to operate an ejector. In order to address this problem, the chlorine gas pressure inside chlorine cylinders is used to directly inject the chlorine into the point of application.

2. Choosing a **Chlorinator feed capacity:**

CHLORINATOR SIZE SHOULD BE ON MAXIMUM POSSIBLE FLOW.

Imperial Units:

$$\begin{array}{ccccccc} \text{GPM} & \times & 0.012 & \times & (\text{PPM}) \text{ Dosage} & = & \text{PPD} \\ \text{Gallons Per Minute} & & & & \text{Parts Per Million} & & \text{Pounds Per Day (Cl}_2\text{)} \end{array}$$

Example: 600 GPM x 0.012 x 3 PPM = 21.6 PPD

In this example a HYDRO 50 PPD Chlorinator would be adequate.

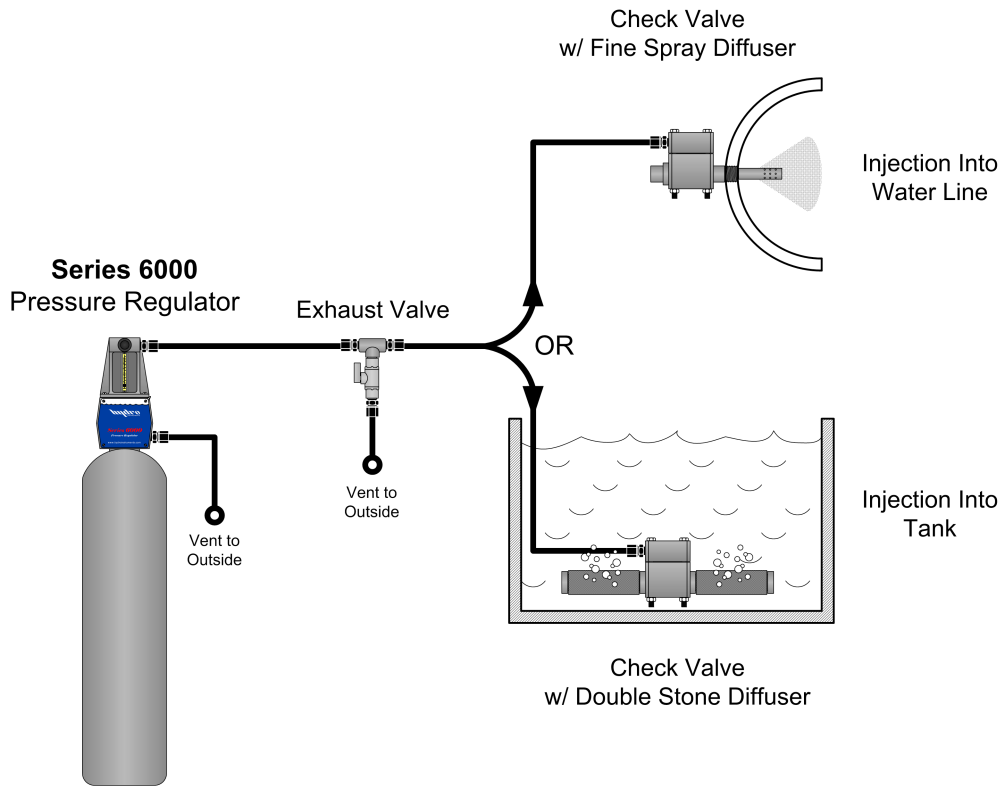
Metric Units:

$$\begin{array}{ccccccc} \text{LPM} & \times & 0.0599 & \times & (\text{PPM}) \text{ Dosage} & = & \text{GPH} \\ \text{Liters Per Minute} & & & & \text{Parts Per Million} & & \text{Grams Per Hour (Cl}_2\text{)} \end{array}$$

3. **Operation pressure:** The chlorine gas pressure should be reduced and controlled to approximately 20 psi after exiting the pressure regulator, and maximum back pressure of the system should be less than 10 psi.

SECTION III: SYSTEM INSTALLATION

FIGURE 1



1. Gas Cylinder

Chlorine gas cylinders must be positioned vertically for use with the Series 6000 Pressure Feed System. The installation and operation must be done in such a way to ensure that only gas and not liquid will enter the pressure regulator.

WARNING: Never position chlorine cylinders horizontally when used with the Series 6000 Pressure Feed System. This would allow liquid chlorine to enter the pressure regulator and it would damage the equipment. Chlorine cylinders must always be positioned vertically.

The maximum filling density for chlorine cylinders is 54%. At about 65° F (18° C) this corresponds to 88% of the cylinder volume being filled with liquid. Due to the high coefficient of expansion of liquid chlorine, a cylinder filled in accordance with the filling density regulation will be full of liquid at about 145° F (63° C) with a danger of bursting from hydrostatic pressure if any further temperature rise occurred. In order to avoid such concerns, cylinders should not be permitted to reach a temperature higher than 125° F (52° C).

If cylinders are stored in a hot place or in direct sun light, the chlorine will increase in temperature and the liquid level inside the cylinders will increase accordingly. The materials of construction of the Series 6000 equipment is not suitable for continuous contact with liquid chlorine and therefore every effort must be made to ensure that liquid chlorine does not enter the pressure regulator.

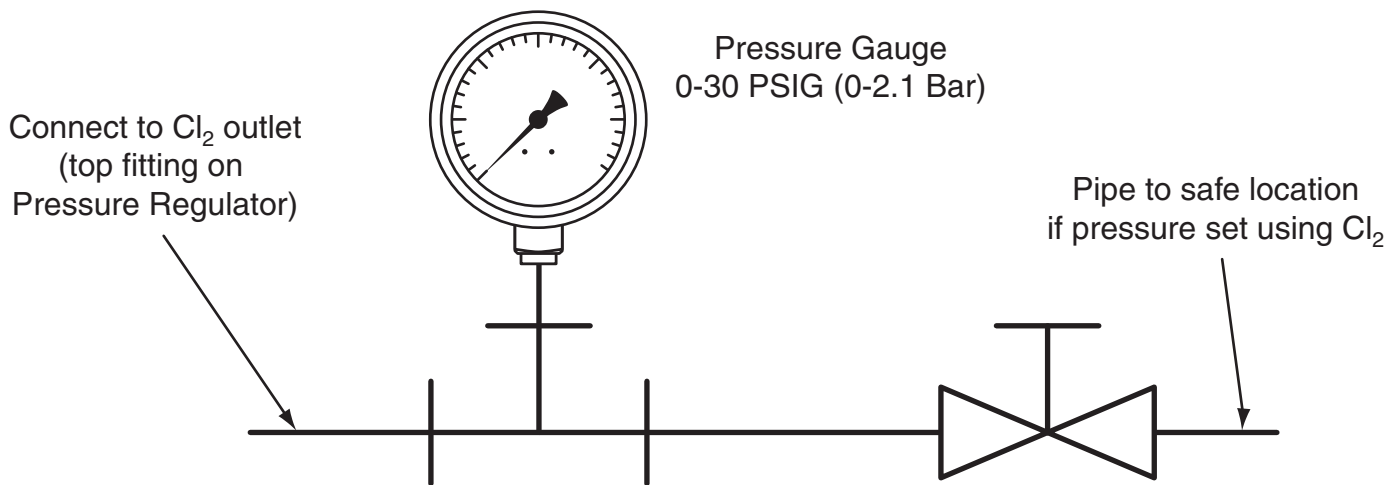
2. Installation of Pressure Regulator (Refer to Figure 1)

NOTE: The chlorine cylinder valve is CLOSED. Do not open the valve until instructed to do so.

- See that safety chain is secured around chlorine cylinder.
- Remove the cylinder protection cap from the chlorine cylinder.
- Examine the pressure regulator for obvious damage.

- d. Remove masking tape used for shipping purposes.
- e. Place the lead gasket on the pressure regulator inlet assembly.
- f. While placing lead gasket on the pressure regulator see that the filter material has not fallen out of inlet assembly. (This filter is necessary to remove particles that may precipitate out of chlorine.) Filter material should be inspected each time the cylinder is changed and changed as necessary.
- g. Mount the pressure regulator on cylinder valve being sure the yoke screw is backed out far enough for sufficient clearance. While tightening the yoke screw be certain that the lead gasket stays in place. Excessive tightening can damage gasket and/or yoke screw. **DO NOT USE EXCESSIVE FORCE.**

FIGURE 2



3. Adjustment of Regulating Pressure

NOTE: The regulating pressure is already set at 20 psi in the factory before shipment. No adjustment is required unless the pressure regulator is disassembled.

NOTE: The inlet pressure should not exceed 120 PSI. Therefore, DO NOT use Nitrogen or Air cylinders with the Hydro Instruments pressure regulator.

- a. Piping hook up to pressure regulator (Refer to Figure 1):
 - i. Mount the pressure regulator to an air manifold, or gas source if air manifold is unavailable. Make sure the chlorine gas will be discharged to a safe location.
 - ii. Connect a gauge assembly, including a gas pressure gauge (0-30 psi) and a shut-off valve, to the upper connector of the pressure regulator.
- b. Testing for sufficient regulating pressure in the pressure regulator:
 - i. Remove the face plate, body plug and o-ring from the front body to get access to the adjusting screw assembly.
 - ii. Fully close the shut-off valve and turn the pressure regulator rate valve to its maximum position, open the gas supply valve. The pressure reading on the gauge should be 1-20 psi.
 - iii. Use an appropriate spanner wrench to turn the adjusting screw and briefly open the cylinder valve (then close immediately) to allow pressure into the regulator. Repeat this procedure several times until the required regulating pressure is reached.
 - iv. Replace the body plug, o-ring and lead gasket. Mount the pressure regulator to gas source (chlorine gas cylinder).

4. Installation of Exhaust Valve

- a. Place the exhaust valve at a safe location to discharge trapped chlorine gas in empty gas cylinders to atmosphere.
- b. Install the exhaust valve in the pressure tubing. The gas will pass through the exhaust valve under normal operation. The manual ball valve allows the operator to vent gas pressure to the outside of the building for cylinder changes.

5. Installation of Check Valve-Diffuser Assembly

- a. Unscrew the diffuser from the valve-diffuser assembly.
- b. Use Telfon tape on the pipe threads and screw the diffuser into the pipe tightly. Make sure the diffuser reaches the main stream inside the pipe.
- c. Screw the diffuser to the check valve-diffuser assembly tightly.

6. Connecting Lines Among Pressure Regulator, Exhaust Valve and Valve-Diffuser Assembly (Refer to Figure 1)

- a. The pressure regulator has two fittings. The upper fitting is used to connect the exhaust valve and check valve-diffuser. The lower fitting is used to connect the vent line to the outside of the building.
- b. The exhaust valve has three fittings. Two of them are used to connect to the pressure regulator and check valve-diffuser assembly. The third one is used to connect the vent line for the discharge of chlorine gas.
- c. The check valve-diffuser has one fitting, which is used to connect to the exhaust valve. The diffuser is either mounted on a pipeline, or submerged in tank or chamber.
- d. Before connecting these components together, the $\frac{3}{8}$ " tubing fittings should be removed and $\frac{3}{8}$ " plastic tubing should be slipped onto the fittings. Then tighten the tubing fittings by hand.

NOTE: Chlorine gas discharged from vent lines should be delivered to safe locations.

NOTE: Be sure to install the insect screens on the outside ends of both vent lines.

SECTION IV: START UP OF CHLORINATION

Material necessary: A small plastic squeeze bottle (provided), $\frac{1}{3}$ full of household ammonia, for detecting chlorine leaks. When ammonia fumes contact chlorine gas a visible white smoke-like gas is produced. (Wipe up any splashed liquid ammonia.)

1. Close the exhaust valve and the pressure regulator rate valve.
2. Open chlorine cylinder valve $\frac{1}{4}$ turn and **close immediately**.
3. Squeeze ammonia bottle (ammonia fumes, not liquid) at gasket and yoke assembly area and around rate valve bonnet: if no fumes appear the seals are tight and it is OK to proceed to the next step. (*NOTE: The fumes are best observed against a dark background.*)
4. Open chlorine cylinder valve $\frac{1}{4}$ turn, leave open, and **recheck for chlorine leaks**. ($\frac{1}{4}$ turn open of the cylinder valve is all that's required. The reason we specify $\frac{1}{4}$ turn is that when you turn it off you know it should close with $\frac{1}{4}$ turn. In an emergency you can shut it off quickly and safely. The wrench should always remain on the cylinder valve while cylinder valve is open.)
5. Adjust the pressure regulator rate valve and set to the desired flow rate. Read flow rate at the center of ball on meter tube scale.
6. Rate valve is not a shut-off valve; it is a flow rate control only. **To shut off chlorine feed close the chlorine cylinder valve.**

SECTION V: CHLORINATION SYSTEM TEST

Material necessary: A small plastic squeeze bottle (provided), 1/3 full of household ammonia, for detecting chlorine leaks. When ammonia fumes contact chlorine gas a visible white smoke-like gas is produced. (Wipe up any splashed liquid ammonia.)

1. Close the exhaust valve and open chlorine cylinder valve 1/4 turn, then close the cylinder valve immediately.
2. Turn the pressure regulator rate valve to its maximum position.
3. Squeeze ammonia bottle at exhaust valve, check valve and connecting lines. If no fumes appear the seals are tight.
4. Adjust the pressure regulator rate valve and set to the desired flow rate. Read flow rate at the center of ball on meter tube scale.
5. Rate valve is not a shut-off valve: it is a flow rate control only. To shut off chlorine feed close the chlorine cylinder valve.

SECTION VI: SHUT DOWN PROCEDURE

1. Close the chlorine cylinder valve (not the rate valve). Ensure the valve is hand tight.
2. Wait for ball to rest at bottom of meter tube.
3. Open the exhaust valve to discharge the remaining chlorine gas to a safe location through vent line.
4. Install the pressure regulator with a new lead gasket on the new cylinder.
5. Close the exhaust valve and check for gas leaks as described in Section V.

SECTION VII: RATE VALVE OPERATION

Turn the rate valve counter-clockwise to open. Open and close to verify feed rate control from zero to maximum on the flow meter tube. Do not use force to fully open the rate valve assembly because this could cause the assembly to come lose and allow chlorine gas to leak out. (*See Appendix for servicing instructions.*)

PREVENTATIVE MAINTENANCE NOTE: Rate valves which are not exercised frequently may experience a build up of a white powdery substance which precipitates out of the chlorine gas. In order to avoid this build up, which can cause the rate valve to become stuck in place, it is recommended that the rate valve be periodically exercised. See Appendix for rate valve maintenance instructions.

SECTION VIII: TROUBLESHOOTING

(I) PRESSURIZED LEAKS

1. Pressurized chlorine leaks are a safety hazard to life and equipment and should be corrected immediately. When searching for this type of leak there are basic safety rules to follow.
 - a. Air breathing pack should be readily available and personnel should know how to use it properly.
 - b. Exhaust fan switch should be located near outside entrance with an additional alternate outside switch appropriately located.
 - c. Chlorine cylinder wrench should remain on the cylinder whenever cylinder is open.
 - d. Plastic squeeze bottle $\frac{1}{3}$ full of household ammonia.
 - e. Buddy system used (two people capable of operating system).
2. If a leak is detected the following should be checked first:
 - a. The **lead gasket** between the chlorine cylinder valve and the chlorinator inlet assembly.
 - i. Tighten the half dog screw on the chlorinator yoke assembly which is used to secure the inlet assembly to the chlorine cylinder valve. (Do not use excessive force.)
 - ii. Always use a new lead gasket. It is recommended to obtain gaskets through Hydro Instruments to be certain of size and quality.
 - b. **Chlorine cylinder valve packing.**
 - i. Tighten the cylinder valve with care, not excessively! Close the valve if problem persists and notify your chlorine supplier.
 - ii. If valve is the problem try to move cylinder with a high degree of safety to an outside location. (**Never** attempt to place cylinder in water as this will only increase the leak and the cylinder may float to the surface.)
 - c. Chlorine leaking out the vent due to **the inlet safety shut off valve** having dirt on the valve seat.
 - i. Close the **chlorine cylinder valve**.
 - ii. Wait until the metering ball drops to zero on the flow tube.
 - iii. Open the exhaust valve to discharge the remaining chlorine gas to a safe location through vent line.
 - iv. Now remove the pressure regulator from the cylinder valve.
 - v. See Appendix for inlet safety shut-off valve servicing instructions.
 - vi. After servicing pressure regulator, adjust the regulating pressure if necessary. Then remount the pressure regulator with a new lead gasket.

(II) NO CHLORINE FEED

1. The gas cylinder is out of chlorine. The scale would read 150 lbs. lighter than when cylinder was new and the ball float in the metering tube would be at zero. Replace the chlorine gas cylinder.
2. Chlorine flow is blocked at pressure regulator inlet assembly due to the dirt from chlorine gas supply. Replace the inlet filter.

(III) FLOWMETER FLOAT DOES NOT RISE WITH GAS TURNED ON AND RATE VALVE OPEN

1. Chlorine flow is blocked at pressure regulator inlet assembly due to the dirt from chlorine gas supply. Replace the inlet filter.
2. Water pressure at the chlorine gas diffuser is too high. Check the water pressure at the chlorine gas diffuser and correct if necessary.

(IV) CHLORINE GAS PRESENT AT VENT FROM FEED UNIT

1. Chlorine flow is blocked at connecting lines. Clean or replace the connecting lines.
2. The check valve-diffuser assembly is plugged. Clean the diffuser.

(V) CHLORINE GAS PRESENT AT VENT FROM EXHAUST UNIT

1. The exhaust valve is open or the exhaust valve ball valve is subject to a failure. Clean the exhaust valve and replace the exhaust valve ball valve if gas flow does not stop.

(VI) WATER IN THE GAS PIPING AND SYSTEM COMPONENTS

1. The check valve must be leaking. Refer to Section A-II of this manual.

APPENDIX: SERVICING THE SYSTEM

Hydro Instruments pressure regulators require little service when operated according to instructions. The following are recommended maintenance instructions.

NOTE: All Hydro Instruments systems come with a three year limited warranty. Hydro does repair and refurbished used units. The repaired and retested units are shipped from Hydro within 48 hours of arrival at the factory with a one year warranty.

Guidelines for Preventative Maintenance: See below for detailed instructions.

1. Service Pressure Regulator every 12 months.
2. Service Exhaust Valve every 12 months.
3. Service check valve-diffuser every 6 months.
4. Replace 3/8" tubing every 12-18 months.

CAUTION: *Use all recommended precautions when using chemicals of any kind, including goggles, gloves, face shields, etc.*

After any of the listed repair procedures, it is necessary to go through the Start-Up including system test again!

SECTION A-I: SERVICING PRESSURE REGULATOR

1. Follow the usual shut down procedure carefully before removing the pressure regulator from the chlorine gas cylinder.
2. Remove the two screws holding the metal yoke plate to the pressure regulator. Grasp the metal yoke and with a slight turning motion pull it out of the pressure regulator body.
3. Remove the four screws in the back body through the flowmeter housing. Pull the flowmeter housing straight out from the back body.
4. Remove the face plate, body plug and O-Ring from the front body.
5. Unscrew the body bolts from the back body. Remove the spring and carefully take the diaphragm assembly out of the back body.
6. To disassemble the diaphragm, grasp the front and rear plates and turn them apart (they are threaded together and may require use of a vice).
7. Inspect all O-Rings and replace if necessary. Then reassemble unit in reverse order.

SECTION A-II: SERVICING CHLORINE GAS CHECK VALVE-DIFFUSER ASSEMBLY

(I) SERVICING THE CHECK VALVE ASSEMBLY: If water leaks back into the system, this means that the check valve assembly has failed. This could be caused by incorrect assembly, a failed gasket, O-Ring or diaphragm, or foreign material lodged in the check valve.

1. Close chlorine cylinder valve. Follow shut down procedures before performing repairs.
2. Wait for the ball to drop in the meter tube. Then open the exhaust valve to discharge the remaining chlorine gas to a safe location through vent line.
3. Unscrew the check valve assembly from the diffuser directly (Perforated tube).
4. Remove the four bolts holding the check valve assembly together.
5. Inside you will find a diaphragm assembly and a spring.
6. The diaphragm assembly can usually be unscrewed by hand. If it is too tight, carefully try large jaw pliers or a vice. Note that a plastic support diaphragm is on the top side of the rubber diaphragm. The purpose is to protect the softer rubber diaphragm in installations with high pressure.
7. Inspect the rubber diaphragm for holes or weak points.
 - a. For O-ring check valves, inspect the OH-CEM-210 O-Ring. Replace if damaged.
8. Reassemble the diaphragm assembly, preferably with a new rubber diaphragm.
9. Install the check valve-diffuser assembly in reverse order being careful to install the spring properly below the assembly.

(II) CLEANING THE DIFFUSER ASSEMBLY

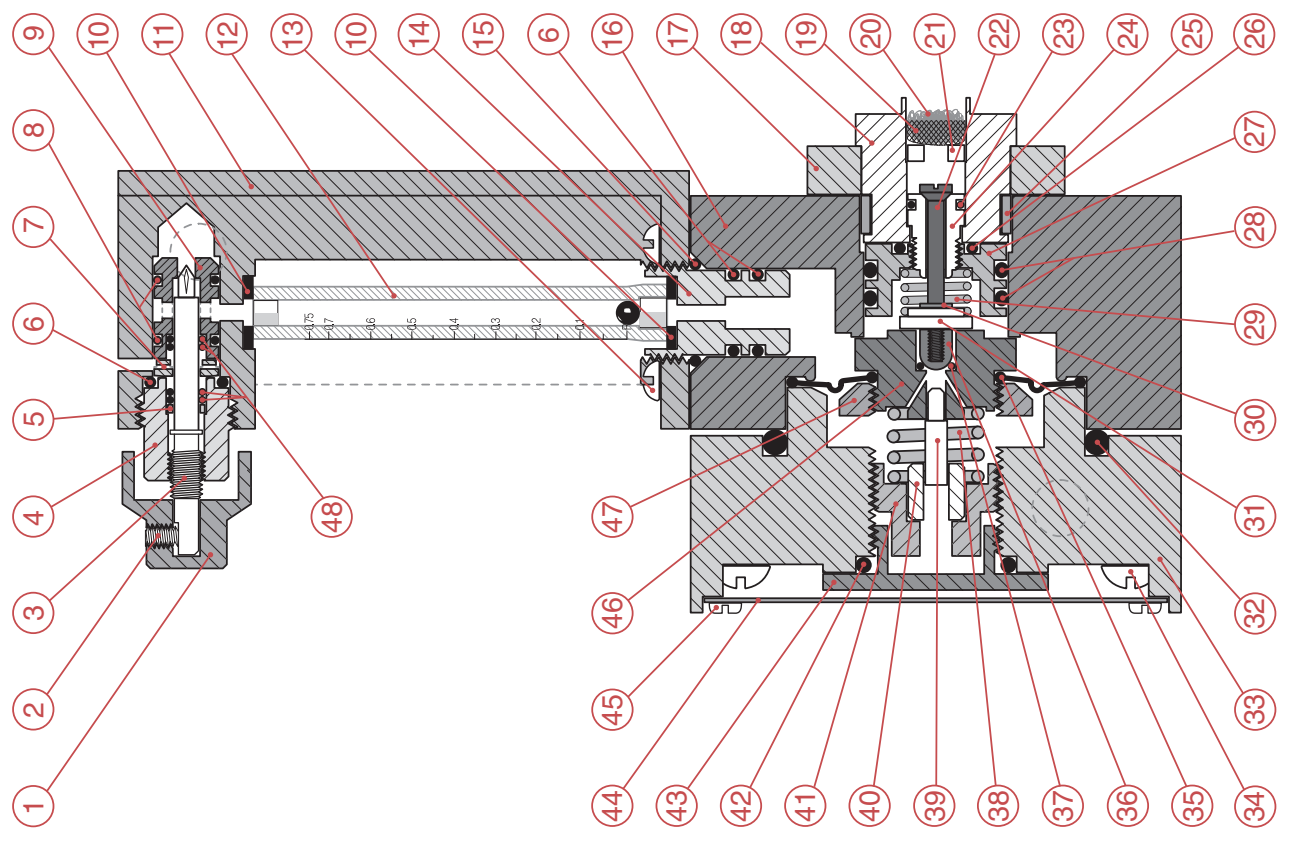
1. Refer Section A-II.1 above to disassemble the check valve-diffuser assembly from the chlorination system.
2. Unscrew the diffuser from the check valve-diffuser assembly.
3. Soak the diffuser in 5% Muriatic Acid for approximately 30 minutes. Then rinse the diffuser with water.
4. Reassemble the check valve-diffuser assembly in the reverse order.

SECTION A-III: SERVICING FLOW METER ASSEMBLY

1. Close chlorine cylinder valve. Follow shut down procedures before performing repairs.
2. Wait for the ball to drop in the meter tube. Then open the exhaust valve to discharge the remaining chlorine gas to a safe location through vent line.
3. Remove pressure regulator from chlorine gas cylinder. See Section A-I for servicing pressure regulator.
4. Remove the four screws in the back body through the flowmeter housing.
5. Pull the flowmeter housing straight out from the back body.
6. Loosen the Inlet plug being careful not to let the meter tube fall as it becomes loose. Remove the meter tube, being careful not to lose the top and bottom stops or the meter tube ball.
7. If there is any buildup in the tube, remove the stops and ball and soak the tube in water with a cleaner like Lime Away or Muriatic Acid until the white material is sufficiently removed from inside the tube.
8. If the markings on the tube are faded, then go over the markings with a permanent marker and then wipe the excess on surface with a dry cloth.
9. If the meter gaskets have not been changed, they can be turned over. If the meter gaskets have been reused already then replace with new gaskets.
10. Remove the Inlet Plug completely from the Bottom Meter Block in order to change or re-grease O-Rings. Check O-Rings and if necessary replace them. Add some grease to the inside walls of the Meter Block where it contacts these O-Rings.
11. Reinstall the ball and stops in the tube and put the tube back into position securing it by tightening the Inlet Plug. DO NOT OVERTIGHTEN.

Item No.	Description	Quantity	Part No.	Item No.	Description	Quantity	Part No.
1	Rate Valve Knob	1	PRH-363	21	Filter Stop	1	VRH-184-500
2	Rate Valve Knob	1	BTH-STA-141	22	Inlet Valve	1	VRH-112-500
3	Set Screw	1	PRH-158-3	23	O-Ring	1	OH-VIT-011
3	Valve Stem (100 PPD)	1	PRH-158-2	24	Valve Seat	1	VRH-110-500
3	Valve Stem (10 PPD)	1	PRH-158-1	25	Retainer Clip	1	VRH-142-500
3	Valve Stem (4 PPD)	1	PRH-158-1	26	O-Ring	1	OH-VIT-112
4	Valve Bonnet	1	PRH-240	27	Seal Plug	1	PRH-365
5	O-Ring Retainer	1	PRH-156	28	O-Ring	2	OH-VIT-212
6	O-Ring	3	OH-VIT-112	29	Inlet Spring	1	SPH-104-000
7	Vent Spacer	1	PRH-155	30	Spring Holder	1	VRH-113-500
8	O-Ring	2	OH-VIT-012	31	Spring Retainer	1	VRH-183-500
9	Valve Sleeve (100 PPD)	1	PRH-157-3	32	O-Ring	1	3PS-332
9	Valve Sleeve (10 PPD)	1	PRH-157-2	33	Front Body	1	PRH-355
9	Valve Sleeve (4 PPD)	1	PRH-157-1	34	Screw (1/4-20 x 2 3/4")	6	BTH-STA-125
10	Meter Gasket (100 PPD)	2	GAH-VIT-103	35	Diaphragm	1	DIH-107-500
10	Meter Gasket (25 PPD)	2	GAH-VIT-102	36	Vent Plug	1	VRH-111-500
10	Meter Gasket (10 PPD)	2	GAH-VIT-101	37	O-Ring	1	OH-VIT-009
11	Meter Housing	1	PRH-357	38	Spring	1	SPH-107-500
12	Meter Tube (100 PPD)	1	MTH-108-100	39	Guide Pin	1	PRH-200-PIN\$
12	Meter Tube (50 PPD)	1	MTH-108-050	40	Teflon Sleeve	1	PRH-316-TS†
12	Meter Tube (25 PPD)	1	MTH-108-025	41	Adjusting Screw	1	PRH-316-AST
12	Meter Tube (10 PPD)	1	MTH-108-010	42	O-Ring	1	OH-VIT-214
12	Meter Tube (4 PPD)	1	MTH-108-004	43	Body Plug	1	PRH-800
12	Meter Tube (1.5 PPD)	1	MTH-108-0015	44	Faceplate	1	PRH-2469-100
13	Screw (10-24 x 1")	4	BTH-STA-126	45	Screw (6-32 x 1/4")	4	BTH-STA-127
14	Meter Inlet Plug	1	PRH-360	46	Diaphragm Bolt	1	PRH-200-DB\$
15	O-Ring	1	OH-VIT-114	47	Diaphragm Nut	1	PRH-1683-500
16	Back Body	1	PRH-190	48	O-Ring	4	OH-VIT-008
17	Yoke Assembly	1	PRH-198	*	Tubing Connector		
18	Inlet Capsule	1	VRH-141-501		(3/8" Tube x 1/4" NPT)	2	BKF-64
19	Inlet Filter Screen	1	VRH-101-500	*	Yoke Screw (1/4-20 x 1 1/4")	4	BTH-STA-130
20	Filter Floss	1	VRH-455-500	*	Not shown.		

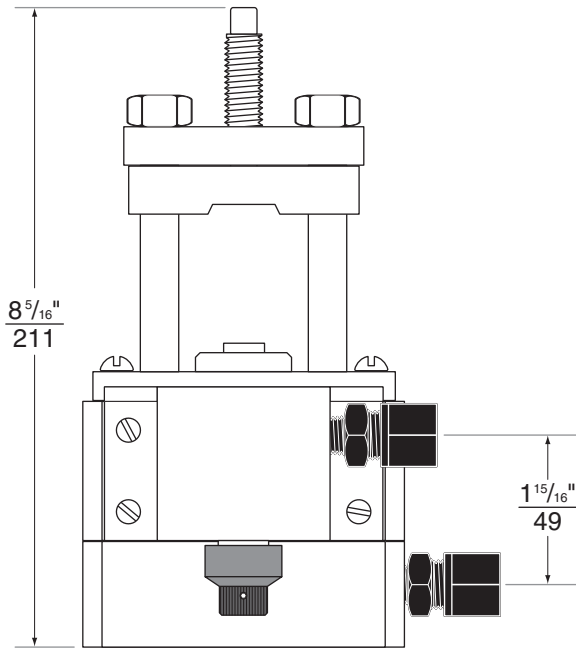
\$ PRH-200-DB and PRH-200-PIN make up PRH-200 Assembly
 † PRH-316-TS and PRH-316-AS make up PRH-316 Assembly




 Date: February 2012
 Scale: 67%
PRESSURE REGULATOR Dwg. No. PRH-6000-CL2

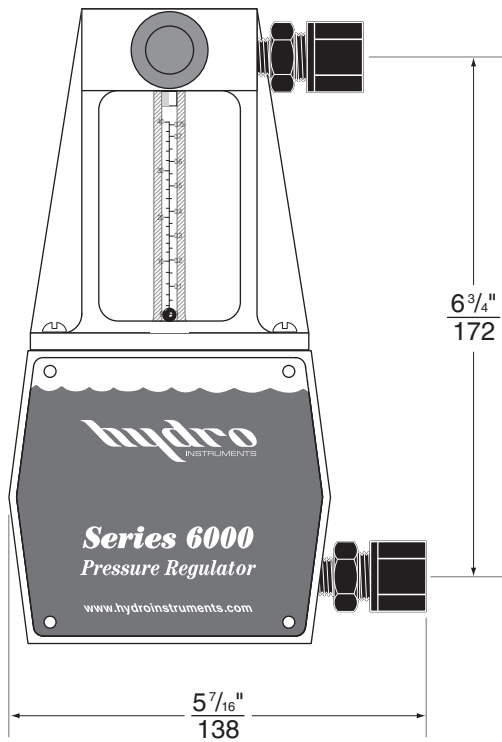


TOP

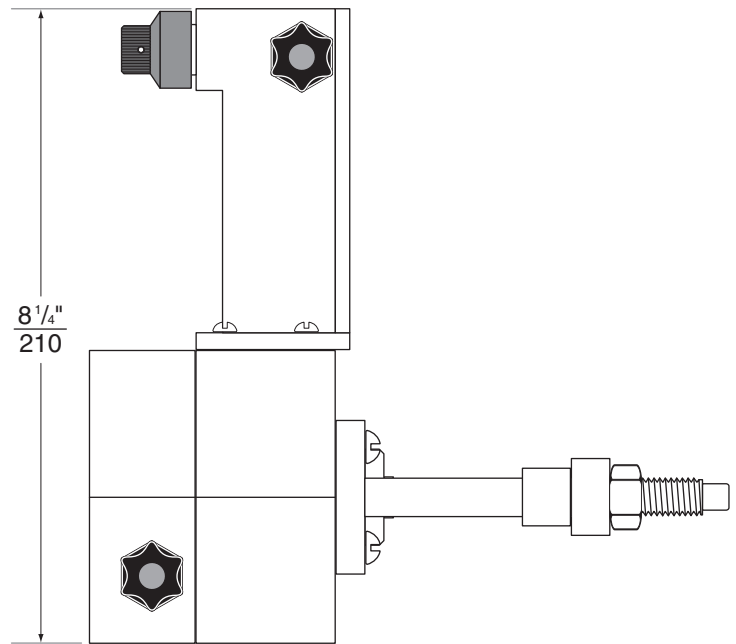


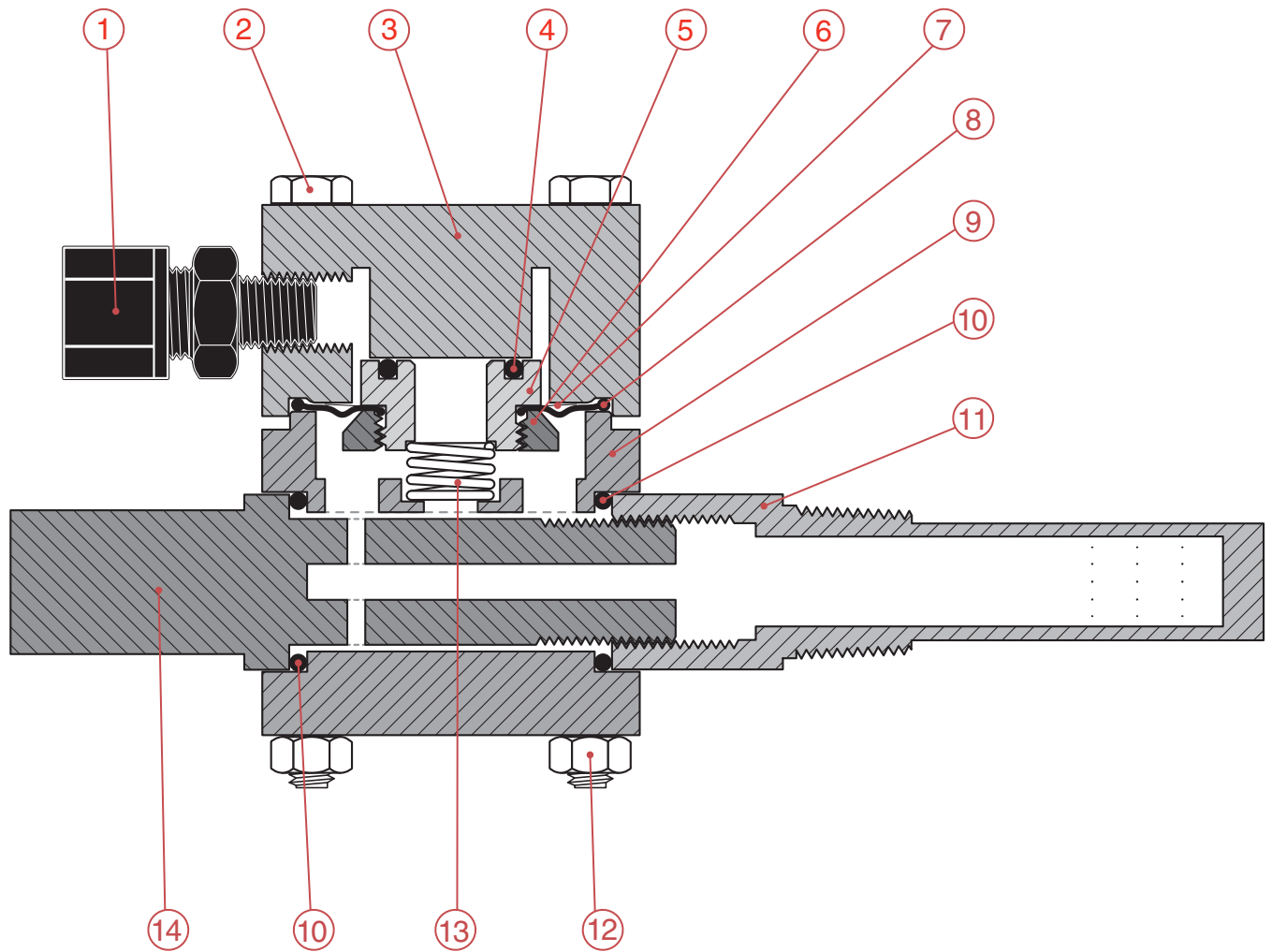
TITLE		DATE	
Series 6000 Pressure Regulator		2/3/2012	
SCALE	MEASUREMENTS	DWG. NO.	
40%	Inches Millimeters	PRH-6000_DIM	

FRONT



SIDE



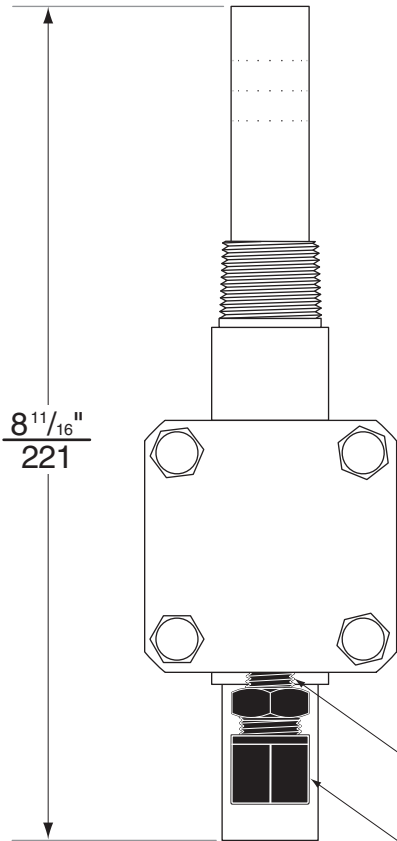


Item No.	Description	Quantity	Part No.
1	3/8" Tubing Connector	1	BKF-64
2	5/16 - 18 x 4" Bolt	4	BTH-STA-136
3	Top Body	1	EJH-237-250
4	O-Ring	1	OH-CEM-210
5	Diaphragm Bolt	1	EJH-236-500
6	Diaphragm Nut	1	EJH-146-500
7	Support Diaphragm	2	DIH-105-500
8	Diaphragm	1	DIH-104-500
9	Bottom Body	1	EJH-153-500
10	O-Ring	2	OH-BUN-214
11	Fine Spray Diffuser	1	EJH-155-100
12	5/16 - 18 Nut	4	NTH-STA-104
13	Spring	1	SPH-106-000
14	Ejector Plug	1	EJH-156-100


CHECK VALVE DIFFUSER

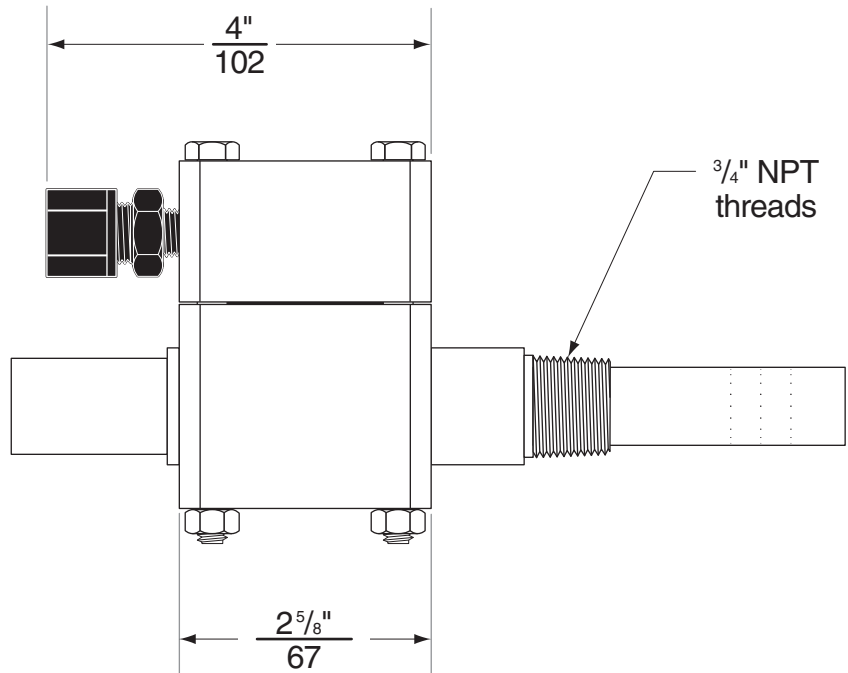
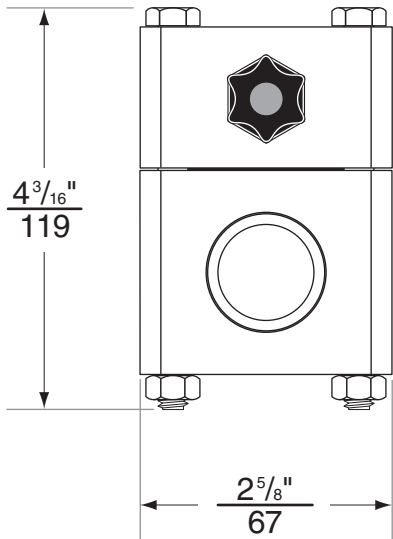
Date: August 2012
 Scale: 80%
 Dwg. No. CVD-100-CL2

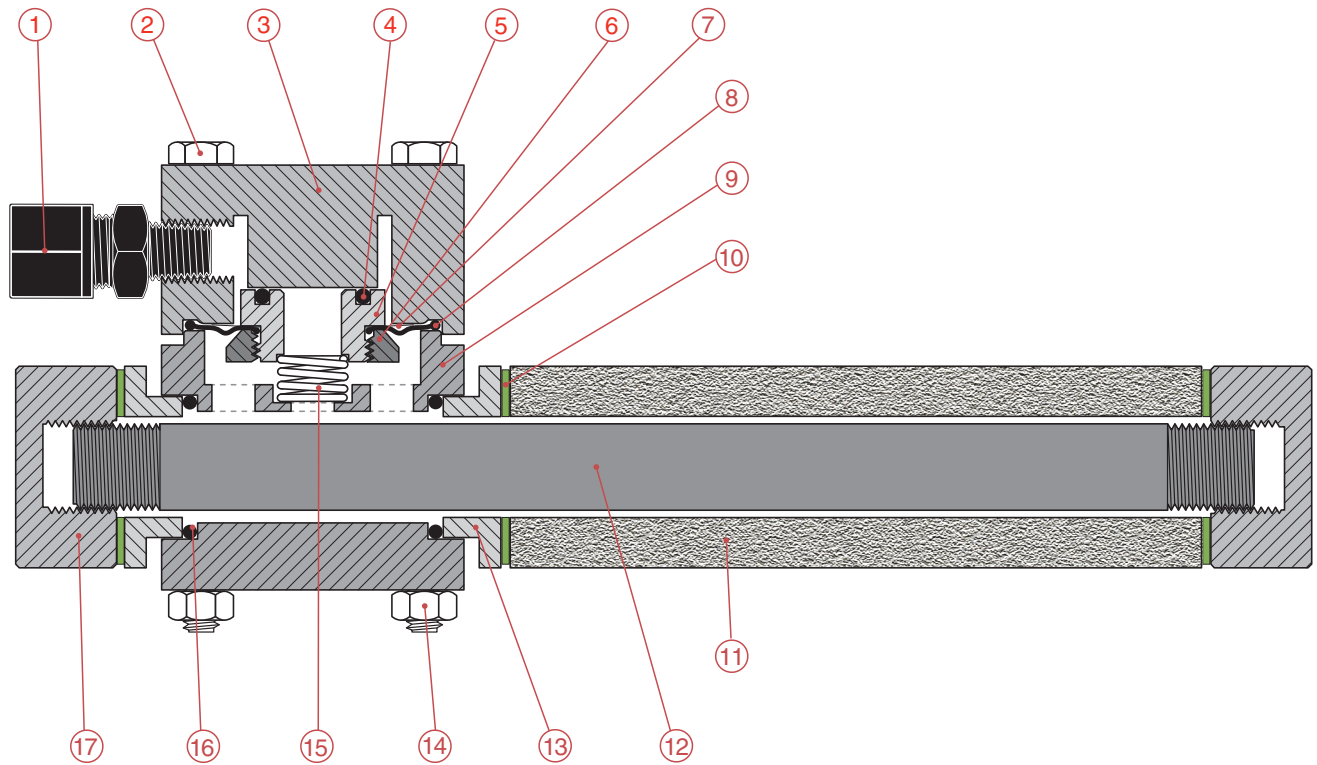
TITLE		DATE	
Model CVD-100-CL2 Check Valve Diffuser		2/8/2012	
SCALE	MEASUREMENTS	DWG. NO.	
50%	$\frac{\text{Inches}}{\text{Millimeters}}$	CVD-100_DIM	



1/4" NPT port

3/8" OD tubing
x 1/4" NPT Fitting



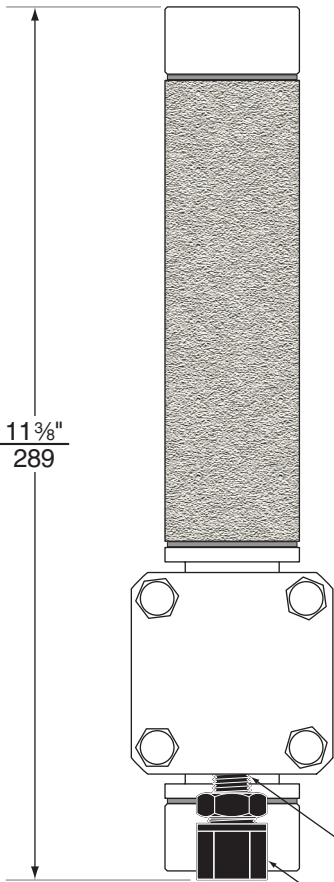


Item No.	Description	Quantity	Part No.
1	3/8" Tubing Connector	1	BKF-64
2	5/16 - 18 x 4" Bolt	4	BTH-STA-136
3	Top Body	1	EJH-237-250
4	O-Ring	1	OH-CEM-210
5	Diaphragm Bolt	1	EJH-236-500
6	Diaphragm Nut	1	EJH-146-500
7	Support Diaphragm	2	DIH-105-500
8	Diaphragm	1	DIH-104-500
9	Bottom Body	1	EJH-153-500
10	Gasket	3	GAH-122-500
11	Stone Diffuser	1	EJD-234-500
12	Stone Diffuser Holder (single)	1	EJH-147-000
13	Adapter	2	EJH-148-000
14	5/16 - 18 Nut	4	NTH-STA-104
15	Spring	1	SPH-106-000
16	O-Ring	2	OH-BUN-214
17	End Fitting	2	EJH-149-000

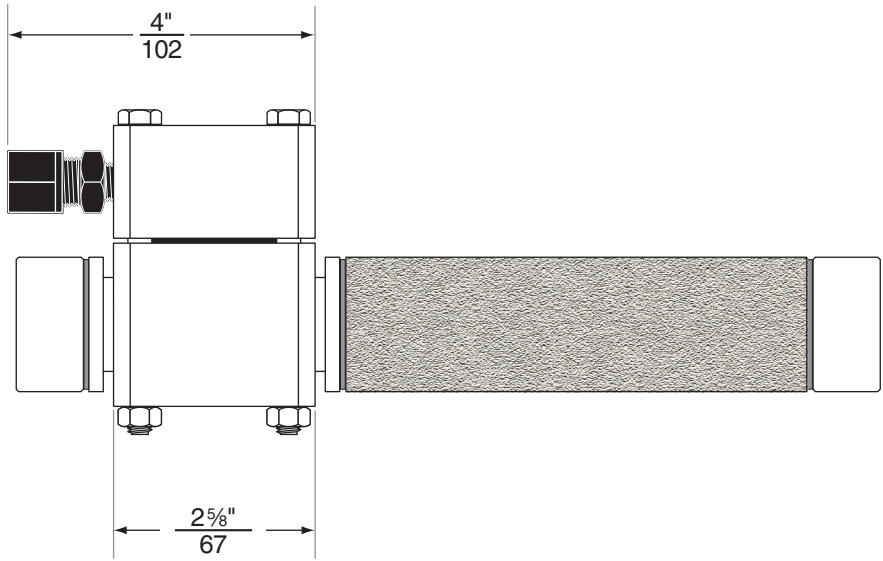
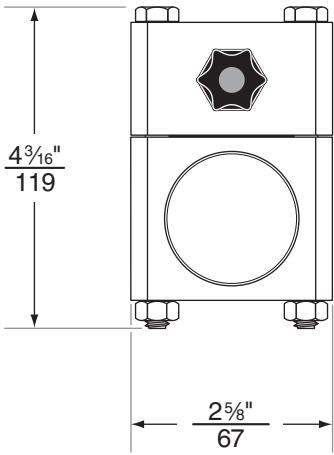

POROUS STONE DIFFUSER

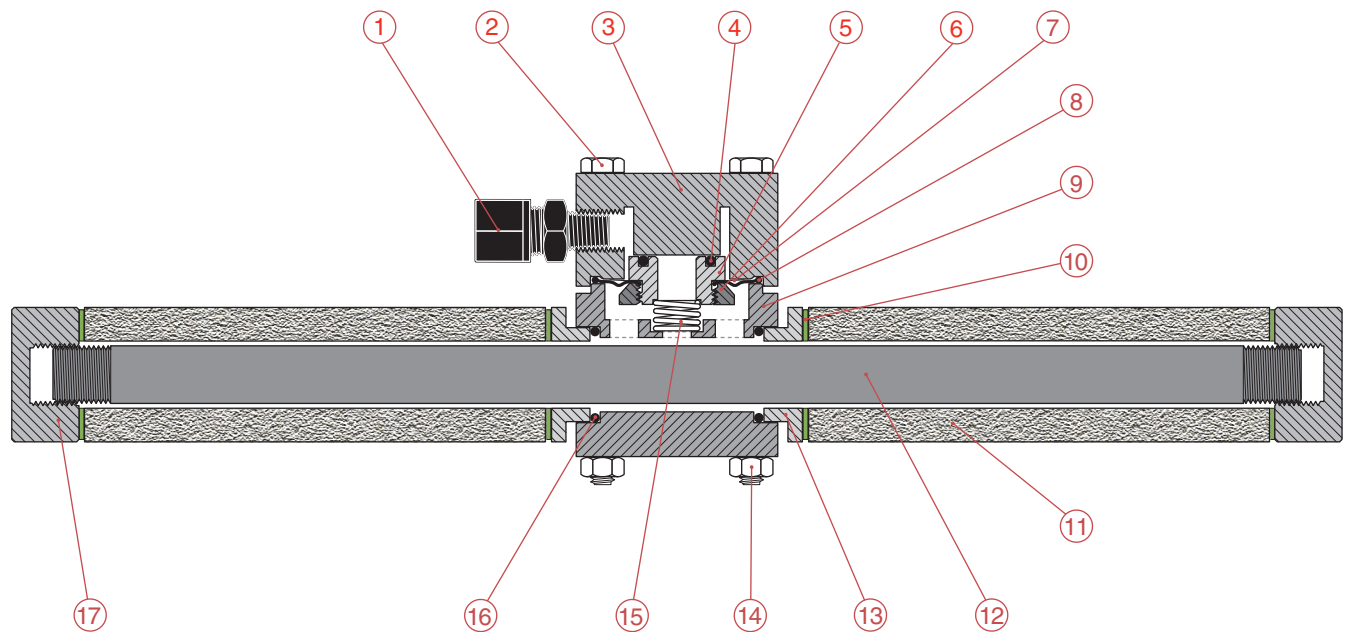
Date: October 2012
 Scale: 60%
 Dwg. No. CVD-101-CL2

TITLE		DATE
Model CVD-101-CL2 Porous Stone Diffuser		10/25/2012
SCALE	MEASUREMENTS	DWG. NO.
40%	<u>Inches</u> Millimeters	CVD-101_DIM



1/4" NPT port
3/8" OD tubing
x 1/4" NPT Fitting





Item No.	Description	Quantity	Part No.
1	3/8" Tubing Connector	1	BKF-64
2	5/16 - 18 x 4" Bolt	4	BTH-STA-136
3	Top Body	1	EJH-237-250
4	O-Ring	1	OH-CEM-210
5	Diaphragm Bolt	1	EJH-236-500
6	Diaphragm Nut	1	EJH-146-500
7	Support Diaphragm	2	DIH-105-500
8	Diaphragm	1	DIH-104-500
9	Bottom Body	1	EJH-153-500
10	Gasket	4	GAH-122-500
11	Stone Diffuser	2	EJD-234-500
12	Stone Diffuser Holder (double)	1	EJH-705-000
13	Adapter	2	EJH-148-000
14	5/16 - 18 Nut	4	NTH-STA-104
15	Spring	1	SPH-106-000
16	O-Ring	2	OH-BUN-214
17	End Fitting	2	EJH-149-000


POROUS STONE DIFFUSER

Date: October 2012
 Scale: 40%
 Dwg. No. CVD-102-CL2



TITLE		DATE
Model CVD-102-CL2 Porous Stone Diffuser		10/31/2012
SCALE	MEASUREMENTS	DWG. NO.
30%	<u>Inches</u> Millimeters	CVD-102_DIM

