AQUATECH
Est. 1994

Agra-Chlor Series 600
Gas Chlorination Systems

Instruction Manual

All Agra-Chlor Chlorination systems are carefully designed and tested for years of safe, accurate field service. All Agra-Chlor Chlorination systems are carefully chlorine tested prior to shipment. All Agra-Chlor products are made of the finest materials. To ensure 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 vacuum regulator which mounts on the chlorine cylinder.
2. The ejector assembly mounts directly to the pipe line, storage tank, wet well, or to a solution line.
3. Standard accessories:
   a. Cylinder wrench.
   b. Twenty-five feet of appropriate polyethylene tubing for vacuum lines.
   c. Ten lead gaskets for vacuum regulator to cylinder connection.
4. Additional parts available from any plumbing supply (or through AQUATECH):
   a. Pressure gauge.
   b. Water shut off valve.
   c. Y-type strainer.

SECTION I: SAFETY INFORMATION (150 LB. CYLINDERS)

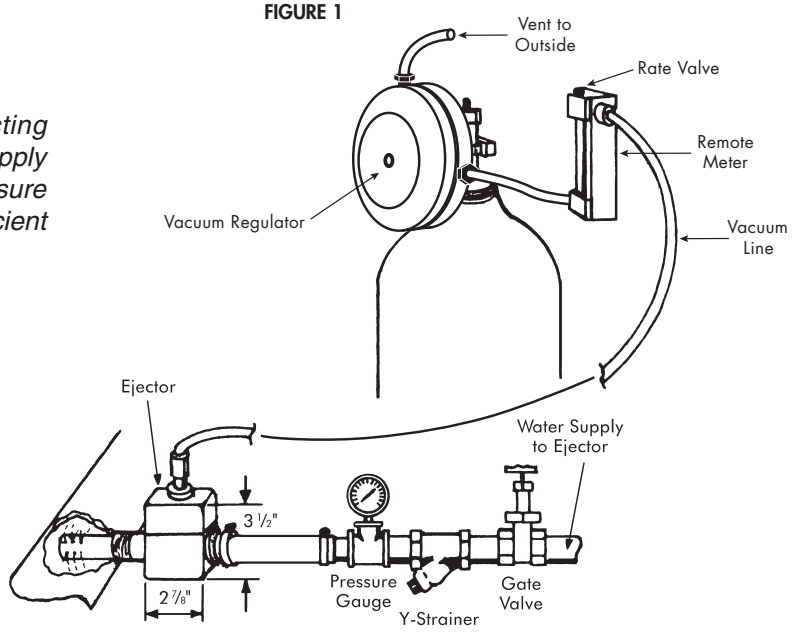
TAKE CARE WITH CHLORINE!

1. Always keep chlorine cylinders in an upright position with the valve cap tightened 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 **vacuum regulator 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 will result in an explosive mixture.

IMPORTANT NOTE:

AQUATECH does not recommend the use of chlorine gas manifolds. *Manifolds contain pressurized chlorine gas thereby increasing the risk of a pressurized chlorine leak. Agra-Chlor vacuum regulators are designed to mount directly onto the valve of chlorine and sulfur dioxide cylinders.* ***Direct cylinder mounting*** *is the easiest and* ***safest*** *configuration to operate and maintain. With this configuration, the chlorine gas flows under vacuum everywhere beyond the one pressure point at the chlorine cylinder valve.*

FIGURE 1



A typical Agra-Chlor Series 600 installation injecting chlorine into a pipe line using city water. The water supply to the ejector should be approximately twice the pressure of the chlorinated pipe line in order to create a sufficient vacuum at the ejector.

AQUATECH
Gas Chlorination Equipment
Torque Specifications

Item	Min. inch•lbs.	Max. inch•lbs.
Yoke Bolts	20	25
Body Bolts	20	25
Vacuum Fittings	15	20
Item	**Min. foot•lbs.**	**Max. foot•lbs.**
Yoke Half Dog	20	25

SECTION II: DESIGN AND INSTALLATION NOTES

1. **The "all vacuum" system** means that system will shut off at the cylinder valve, should the vacuum line be broken, if water is stopped for any reason, or if the vacuum regulator is physically damaged.

2. Choosing a **vacuum regulator feed capacity:**

   VACUUM REGULATOR SIZE SHOULD BE ON MAXIMUM POSSIBLE FLOW.

   Imperial Units:

GPM	x	0.012	x	(PPM) Dosage	=	PPD
Gallons Per Minute				Parts Per Million		Pounds Per Day (Cl_2)

   Example: 600 GPM x 0.012 x 3 PPM = 21.6 PPD
   In this example a 50 PPD vacuum regulator would be adequate.

   Metric Units:

LPM	x	0.0599	x	(PPM) Dosage	=	GPH
Liters Per Minute				Parts Per Million		Grams Per Hour (Cl_2)

3. **TOTAL BACK PRESSURE** is the pressure in the pipeline to be chlorinated plus the friction losses in the solution line between the ejector and the point of injection at the pipeline. Ejectors capable of operating with back pressures up to 300 Psig are available.

4. It is preferable that the ejector be located at the point of solution injection in order to eliminate the need for **solution lines.** Friction losses in the solution line will **increase the ejector back pressure.** Friction losses can be reduced by increasing the solution line internal diameter and limiting the number of flow restrictions and turns. Also, be sure that the solution line material is resistant to **the highly concentrated chlorine mixture. Avoid solution lines wherever possible.**

5. The only connection between the ejector and the vacuum regulator is black polyethylene tubing which carries the vacuum (originating at the ejector) to the vacuum regulator, allowing the system to operate. Up to 100 feet of polyethylene tubing between vacuum regulator and ejector is standard. For longer distances consult AQUATECH.

SECTION III: SYSTEM INSTALLATION

(I) INSTALLATION OF AGRA-CHLOR EJECTOR (Refer to Figure 1)

1. Installation of AGRA-CHLOR EJECTOR:
   a. Remove the diffuser from the ejector assembly and place two wraps of Teflon tape on diffuser threads.
   b. **Do Not** install diffuser into pipe line when assembled with ejector.
   c. Turn diffuser by hand into NPT threads of pipe line ($^3/_4$" NPT). Place wrench on diffuser and tighten an additional **one half turn maximum.**
   d. Reconnect diffuser to ejector making sure O-rings are on each side of nozzle and diffuser.

2. Testing of ejector. *(Note: The vacuum regulator should still be in the shipping case.)*
   i. Piping hook up to ejector (Refer to Figure 1 and **Servicing Section in this Manual**).
      a. Ejector should be installed down stream at a sufficient distance so that chlorinated water is not re-circulated through the booster pump.
      b. On the water inlet side to the ejector nozzle the following should be installed: a water inlet valve, Y-strainer, and a pressure gauge.

ii. Testing for sufficient pump pressure to operate ejector. Also checking that booster pump (if applicable) operating in the proper direction.

Note 1: Ejector must have some back pressure to prevent jetting. (Jetting causes loss of vacuum)

Note 2: When chlorinating into a contact chamber a tee should be installed on the solution line with a vacuum breaker to prevent siphoning.

a. If operating with city water pressure (no booster pump), open the water inlet valve to the ejector and feel for suction (with your finger) at the fitting on the top of the ejector.

b. If using a booster pump, open the water inlet valve to the ejector and the pressure gauge should indicate a sufficient boost. (See ejector curves at the end of this manual.) If pump is operating in proper direction there should be a strong vacuum at the fitting on the top of the ejector. Feel for suction (with your finger) at the fitting on the top of the ejector.

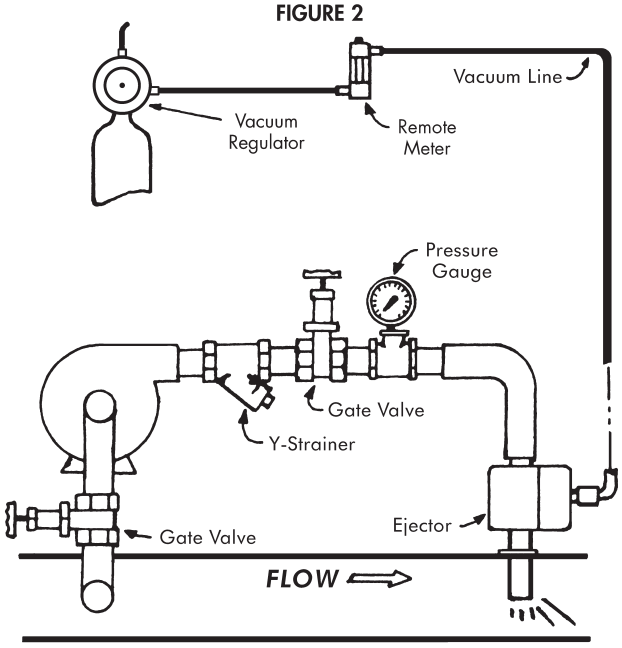
c. If the ejector has tested satisfactorily continue on to the next step (Mounting the Vacuum Regulator).

(II) INSTALLATION OF AGAR-CHLOR VACUUM REGULATOR (150 lbs. Cylinders)

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

1. See that safety chain is secured around chlorine cylinder.
2. Remove the cylinder protection cap from the chlorine cylinder.
3. Examine the vacuum regulator for obvious damage.
4. Remove masking tape on the back of the vacuum regulator used for shipping purposes.
5. Place lead gasket over vacuum regulator inlet assembly.
6. While placing lead gasket on vacuum regulator see that the filter is installed in the inlet assembly. (This filter is necessary to remove particles that may cause the vacuum regulator to leak to vent.)
7. Mount vacuum 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



A typical Agra-Chlor Series 600 installation injecting chlorine into a pipe line using a centrifugal pump. Note the location of gate valves for easy Y-strainer cleaning and practical pump maintenance.

NOTE: Pump suction should be 5 feet away from ejector injection point. On larger pipe diameters of 6 inches or greater a distance of 10 times the pipe diameter should be maintained so that chlorinated water is not recirculated through the booster pump.

NOTE: Pump suction and ejector must be from the side of pipeline, not from top of the main.

(III) CONNECTING VACUUM LINES BETWEEN VACUUM REGULATOR, EJECTOR AND VACUUM REGULATOR VENT TO OUTSIDE (Refer to Figures 1 and 2)

1. The connector on the right side of vacuum regulator is for vacuum line tubing to ejector. (Allow enough vacuum tubing for changing cylinders.)
2. Connect vacuum tubing to top connector on the vacuum regulator and vent to safe area outside of building. (Place bug screen outside on end of vent tubing.)

   *NOTE: **Do Not** connect vent lines from two vacuum regulators to one common vent. You **must** run **separate** vent lines to the outside, when using multiple vacuum regulators.*

SECTION IV: CHLORINATION SYSTEM VACUUM TEST

1. **Do Not** open chlorine cylinder valve until vacuum test is satisfactorily completed.
   a. Vacuum Test
   With the chlorine cylinder still closed, start the ejector booster pump and the meter tube ball should drop to the bottom within about ten seconds. If the ball continues to bounce there is either a leak at the lead gasket or a loose connection at the vacuum tube fittings or meter tube. (The tube fittings should be hand tight. It is not necessary to use pliers or a wrench on these fittings.) At this time the rate valve should be open two or three turns.
   b. If the ejector is operating properly (pulling sufficient vacuum) the guide pin should be recessed approximately $^1/_8$" below the surface of the front body
   c. Turn off water supply to ejector.
   d. Wait 5 to 10 minutes with water supply off. The guide pin should remain recessed (below the surface of the front body).
   e. If the system is vacuum tight proceed to the next step.
   f. Disconnect vacuum tubing at top of vacuum regulator to allow air to enter the system. Reconnect tubing.

SECTION V: START UP OF CHLORINATION

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. Open chlorine cylinder valve $^1/_4$ turn and **close immediately.**
2. 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.)*
3. Open chlorine cylinder valve $^1/_4$ turn, leave open, and **recheck for chlorine leaks.** ($^1/_4$ turn open of the cylinder valve is all that's required. The reason we specify $^1/_4$ turn is that when you turn it off you know it should close with $^1/_4$ 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.)
4. Turn on water supply or booster pump to ejector and set rate valve to desired flow rate. Read flow rate at 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 while pump is still running.
2. Wait for ball to rest at bottom of meter tube.
3. Break vacuum by removing the tubing at the vacuum regulator and reattach. (Repeat at least 2 times for more complete removal of gas from the system.)
4. Shut down the water supply to the ejector.

This procedure of shut down must be followed before a vacuum regulator is removed from a cylinder.

NOTE: After installing the vacuum regulator with a new lead gasket on the new cylinder, the vacuum tubing on the output fitting should be removed to allow air to enter the system and break the vacuum. ***Not releasing vacuum and turning on cylinder will slam the diaphragm forward and could cause damage to the diaphragm assembly.*** *You can also break the vacuum by turning the rate valve out of the bonnet. Either way is acceptable.*

SECTION VII: RATE VALVE OPERATION

After about 7 turns, the gas feed rate will experience approximately a 20% drop as an air passage is opened through the hole in the monel bonnet. Further turns will completely remove the rate valve from the flow meter tube, which will cause a loss of gas feed. ***(See Appendix for servicing instructions.)***

The O-ring seal for the rate valve is locked in place under the valve bonnet and does not come out when the rate valve is pulled out of the bonnet.

PREVENTATIVE MAINTENANCE NOTE: Rate valves that 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 $^1/_3$ 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 vacuum regulator inlet assembly.
      i. Tighten the half dog screw on the vacuum regulator 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 AQUATECH 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. Turn off water supply to ejector.
   iv. Now remove the vacuum regulator from the cylinder valve.
   v. See Appendix for inlet safety shut off valve servicing instructions.
   vi. After servicing and remounting vacuum regulator with a new lead gasket, pull a vacuum test **before** you turn on the chlorine cylinder valve. ***See "Chlorination System Vacuum Test" (Section IV).***

(II) NO CHLORINE FEED

Possible causes:

1. No vacuum being produced by ejector.
   a. Remove poly tubing from ejector fitting and place your finger on it; you should feel a suction.
   b. If you feel no suction (vacuum) check in this order:
      i. **Nozzle *(See Appendix)*:** Turn off water supply and remove nozzle from ejector.
         (1) It may be clogged with a stone or other foreign matter. Flush out or run pipe cleaner through only.
         (2) If there is a build-up of rust, iron, or manganese, place the nozzle in a Muriatic acid for five minutes and rinse with water. If you see a black syrup substance you may find it necessary to clean the nozzle on a preventative maintenance schedule.
      ii. **Inlet Water Supply.**
      iii. Reduced city water pressure.
      iv. Y strainer needs cleaning.
      v. Booster pump cavitating (lost its prime).
      vi. Booster pump insufficient boost due to wear or single phasing due to loss of one leg of power.
      vii. Booster pump may have flooded suction.
2. Chlorine flow blocked at vacuum regulator inlet assembly.
   a. The **Inlet filter could be clogged.**
3. **Out of Chlorine.**
   a. The scale would read 150 lbs. lighter than when cylinder was new.
   b. Flow ball would be at zero and guide pin should be recessed below the surface of the front body.

(III) CHECK VALVE FAILURE (Water in flow tubes and vacuum lines)

1. Cause – Ejector check valve failure. Possible causes of ejector check valve failure:
   a. Objects or material preventing closure of ejector check valve.
   b. Failure of OH-CEM-210, OH-VIT-023 or OH-VIT-137 O-Ring.
   c. Failure of the KDH-104-500 Diaphragm.
2. Corrective Action
   a. Follow Section A-VI to repair ejector check valve.
   b. Disassemble and dry vacuum regulator(s), remote meter(s), and switchover module.
   c. Follow Section IV vacuum test procedure before startup of chlorination.

APPENDIX: SERVICING THE AGRA-CHLOR SYSTEM

AQUATECH vacuum regulators require little service when operated according to instructions. The following are recommended maintenance instructions.

Guidelines for Preventative Maintenance: See below for detailed instructions.

1. Service Rate Valves every 4 months. (See Section A-III)
2. Replace Rate Valve O-ring every 12 months. (See Section A-III)
3. Service Flow Meter every 12 months. (See Section A-II)
4. Service Ejector every 12 months. (See Sections A-V and A-VI)
5. Replace vacuum tubing every 12-18 months.
6. Replace vacuum tubing fittings every 18-24 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 vacuum test again!

SECTION A-I: CLEANING THE SAFETY SHUT OFF VALVE AND SEAT

1. Remove the two screws holding the metal yoke plate to the vacuum regulator body.
2. Grasp the metal yoke and with a slight turning motion pull it out of the vacuum regulator body.
3. Remove the 3PS-214 O-Ring from the Seal Plug.
4. Remove the Inlet Filter Holder (and/or the filter) from the Seal Adapter.
5. Using a short flat head screwdriver and a pair of pliers unscrew the YM-100A Inlet Valve Stem from the YM-102A Vent Plug.

   NOTE: Protect the YM-102A Vent Plug from the pliers with a cloth or paper.

   NOTE: This should be done with the Seal Plug installed in the Yoke Assembly unless the Yoke Assembly is being replaced.
6. Now the YM-100A, YM-101A, YM-102A, YP-100, and YM-103 should all be removed and cleaned.

   NOTE: Especially clean the YM-100A in the region where it meets the YP-101A to form the seal. This surface should be polished as smooth as possible.
7. Using a rod of 0.250" diameter, the YP-101A Inlet Valve Seat can be pressed out of the Seal Plug from the spring side. The YP-101A should be cleaned and carefully inspected for scratches or cuts especially where it is to seal with the YM-100A.

   NOTE: Sometimes the YP-101A will be cut or deformed such that it cannot seal. If you perform this service and the Vacuum Regulator is still leaking to vent, then the YP-101A should be replaced with a new one.
8. Clean the Seal Plug thoroughly before reassembling the unit in the following order:
   a. Lubricate O-Rings with Flurolube™ grease.
   b. Insert the new or cleaned YP-101A with O-Ring 3RS-010.
   c. Insert and retighten the YM-100A, YM-101A, YP-100, YM-103 and YM-102A as shown in the drawing.

NOTE: DO NOT USE EXCESSIVE FORCE IN TIGHTENING the YM-100A to the YM-102A. These threads can break if over-tightened.

d. Insert a new Filter Cartridge.

e. Install a new 3PS-214 O-Ring on the Seal Plug.

SECTION A-II: REMOTE METER PANEL

(I) CLEANING THE RATE VALVE

1. Unscrew the rate valve knob and stem (by hand) completely out of the rate valve bonnet.
   NOTE: Be careful not to let the meter tube drop in the next step. It will come loose.
2. Unscrew the rate valve bonnet using pliers (carefully and using a cloth to protect the part). The rate valve sleeve should also be removed.
3. Replace the OH-VIT-008 O-Rings on the rate valve stem by separating the valve bonnet and sleeve.
4. Lubricate the new O-Rings lightly with Flourolube grease before replacing the sleeve, bonnet and rate valve.

(II) CLEANING THE METER TUBE

1. Remember to be careful not to lose the stops or ball in the following steps.
2. Remove the white stops at either end of the tube (you could use a paper clip).
3. Soak the tube in warm water with a cleaner like lime away or Muriatic Acid. Also, brush the inside of the tube with a pipe cleaner.
   NOTE: Always follow safety precautions with Muriatic Acid and other chemicals.
4. Dry the meter tube and reinstall the ball and stops.
5. It is recommended that new meter tube gaskets be used when reinstalling the meter tube.
6. Reinstall the meter gaskets and meter tube, making sure to center the tube on the top and bottom meter gaskets.
7. Tighten the rate valve bonnet with reasonable force to make a seal. Do not use excessive force.
   NOTE: All other vacuum regulator repairs should be done by the factory or authorized repair personnel.

WARNING: *If the vacuum regulator leaks gas out the vent or any other place on the body the problem is most likely caused inside the yoke assembly. It is not recommended that the yoke assembly be disassembled because if it is not done properly dangerous leakage of pressurized gas could result.*

SECTION A-III: EJECTOR/CHECK VALVE ASSEMBLY

(I) LOSS OF VACUUM AT THE EJECTOR: If vacuum is lost at the ejector and water supply is sufficient, then the nozzle is most likely clogged, broken or loose. Before working on the ejector it must first be isolated so that water will not leak when the ejector is removed.

1. First detach the intake side (nozzle) of the ejector from the pipe line.
2. Rotate the complete ejector body counter clockwise. This loosens the threaded portion of the nozzle from the diffuser. It also eliminates the need for pliers on the nozzle which could damage the plastic.
3. Inspect the nozzle for:
   Pipe scale, stones, dirt, etc…
   Build-up of iron, manganese, calcium, etc…
4. The nozzle should be soaked and brushed with warm water mixed with a cleaner like Muriatic Acid.
   NOTE: TAKE CARE NOT TO SCRATCH OR ATTEMPT TO MODIFY THE ORIFICE IN ANY WAY.
5. Using two new gaskets the ejector can now be reassembled.

When reassembling the ejector the nozzle and diffuser should be screwed together hand tight leaving the ejector body 90 degrees to the left of its final position. Once the nozzle and diffuser are hand tight, the ejector can then be turned the final 90 degrees.

WARNING: *Do not use excessive force in tightening the nozzle, diffuser and ejector assembly. The ejector is constructed of PVC and excessive force can break the parts.*

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

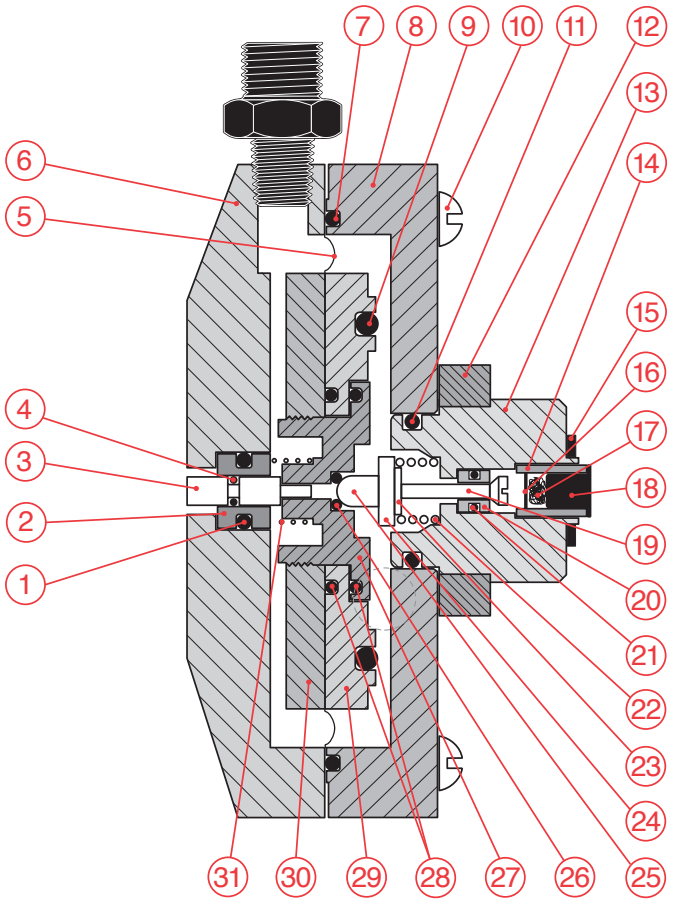
1. Remove the four bolts holding the ejector body together.
2. Inside you will find a diaphragm assembly and a spring.
3. The diaphragm assembly can usually be unscrewed by hand. If it is too tight, carefully try large jaw pliers or a vice.
4. Replace the O-Ring in the diaphragm bolt.
5. Inspect the diaphragm for holes or weak points.
6. Reassemble the diaphragm assembly, preferably with a new diaphragm.
7. Install the assembly in the recess between the ejector body halves being careful to install the spring properly below the assembly.

SECTION A-IV: DISASSEMBLY OF VACUUM REGULATOR UNIT

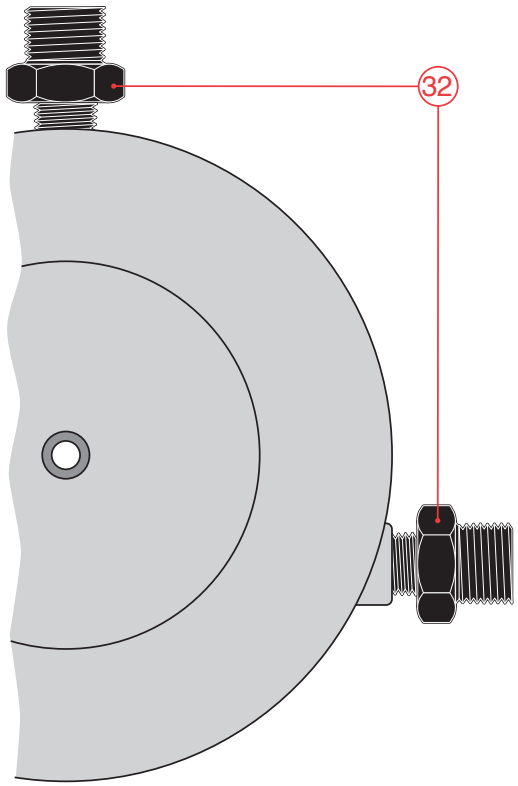
1. Follow the usual shut down procedure carefully before removing any vacuum regulator from the gas bottle.
2. Follow Appendix Section I to remove the Yoke assembly from the vacuum regulator body.
3. Unscrew the body bolts from the Back Body.
4. Pull the Back Body directly away from the Front Body until they separate.
5. Carefully take the diaphragm assembly and pull it directly away from the Front Body (the two are pin connected by the guide pin).
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.
8. Remove the Pin Guide (FB-104) by carefully pushing it from the face plate side of the Front Body. Be careful not to damage the center hole.
9. After inspection and replacement of parts or O-Rings, reassemble unit in reverse order.

   NOTE: DO NOT FORGET THE VENT SPRING (DM-100).

SIDE VIEW



FRONT VIEW (Partial)



Item No.	Description	Quantity	Part No.	
1	O-Ring	1	3RS-014	*
2	Pin Guide	1	FB-104	
3	Guide Pin	1	DM-101A	
4	O-Ring	1	3RS-006	*
5	Double Diaphragm	1	DP-103	*
6	Front Body	1	FB-600A	
7	O-Ring	1	3PS-156	
8	Back Body	1	BB-600A	
9	O-Ring	1	3PS-332	
10	Body Screws (Monel)	4	1/4-20 x 1 1/2"	
11	O-Ring	1	3PS-214	*
12	Back Plate	1	YM-605A	
13	Seal Adapter	1	SAWS-US3	
14	Filter Holder	1	KFH-300	
15	Lead Gasket	1	LG-100	
16	Inlet Filter Screen	1	S-210	*
17	Filter Material	1	TS-14-FO	*
18	Teflon Filter	1	T-210	*

Note: * These parts are included in PM Kit KT6-100-VRC.

Item No.	Description	Quantity	Part No.	
19	Inlet Valve	1	YM-100A	
20	Inlet Valve Seat	1	YP-101A	*
21	O-Ring	1	3RS-010	*
22	Inlet Spring	1	YM-103	
23	Bearing Washer	1	YM-101A	
24	Spring Retainer	1	YP-100	*
25	Vent Plug	1	YM-102A	
26	O-Ring	1	3RS-009	*
27	Diaphragm Vent Bolt	1	DP-102A	
28	O-Rings	2	3PS-029	*
29	Rear Diaphragm Plate	1	DP-101A	
30	Front Diaphragm Plate	1	DP-100A	
31	Vent Spring	1	DM-100	
32	3/8" Vent & Vacuum Fitting	2	BKF-64	*
*	Yoke Screws (Monel)	2	1/4-20 x 1 7/8"	

* Not shown.

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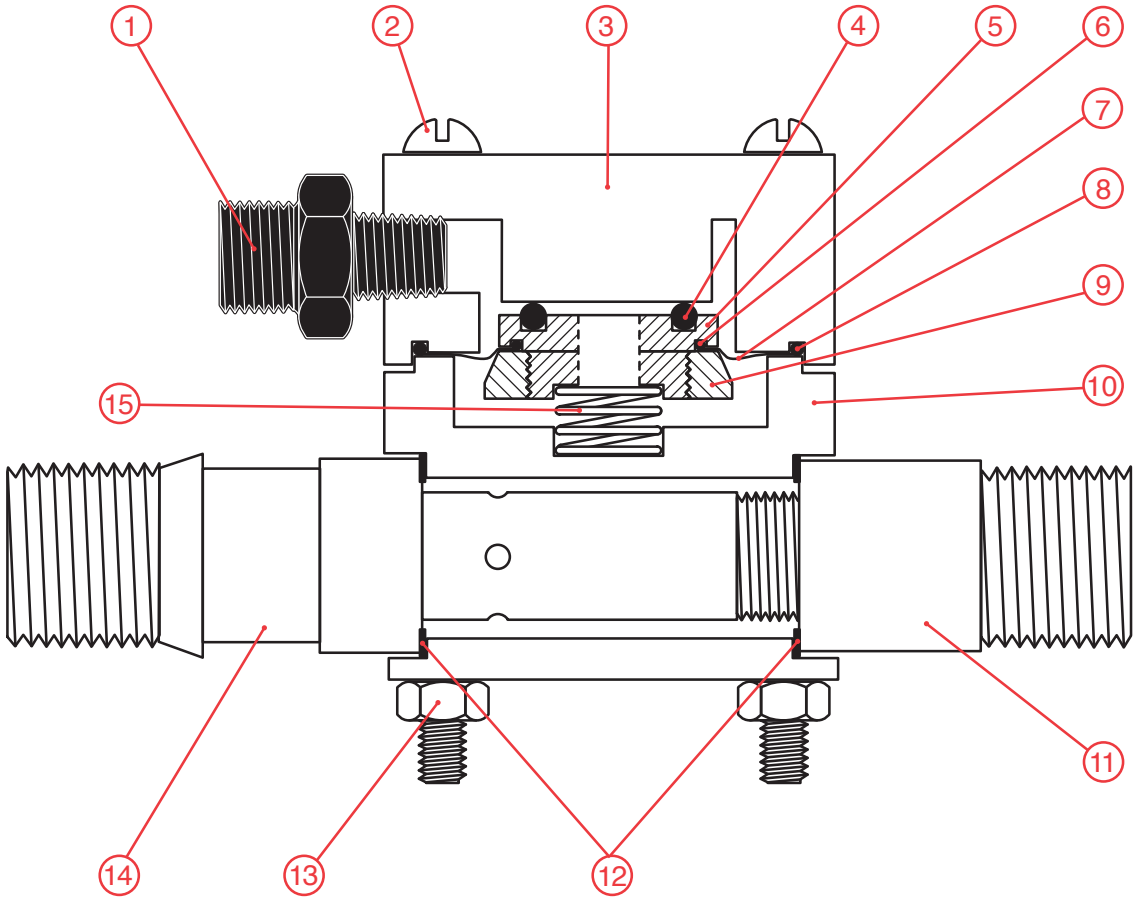
VACUUM REGULATOR

Date: December 2006
Scale: 67%
Dwg. No. Series 600



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-236-501 **
6	O-Ring	1	OH-VIT-023 **
7	Diaphragm	1	KDH-104-500 **
8	O-Ring	1	OH-VIT-137 **
9	Diaphragm Nut	1	EJH-146-500 **
10	Bottom Body	1	EJH-153-500
11	Diffuser	1	E-1063
12	O-Ring	2	OH-BUN-121 *
13	5/16 - 18 Nut	4	NTH-STA-104
14	Nozzle	1	† See Note
15	Spring	1	SPH-106-000

Notes: * These parts are included in PM Kit KT6-100-EJA.

** These parts are included in the Diaphragm Bolt Assembly (EJH-968-50K) and PM Kit KT6-100-EJA.

† Available Nozzles: CNH-015-156
CNH-012-191

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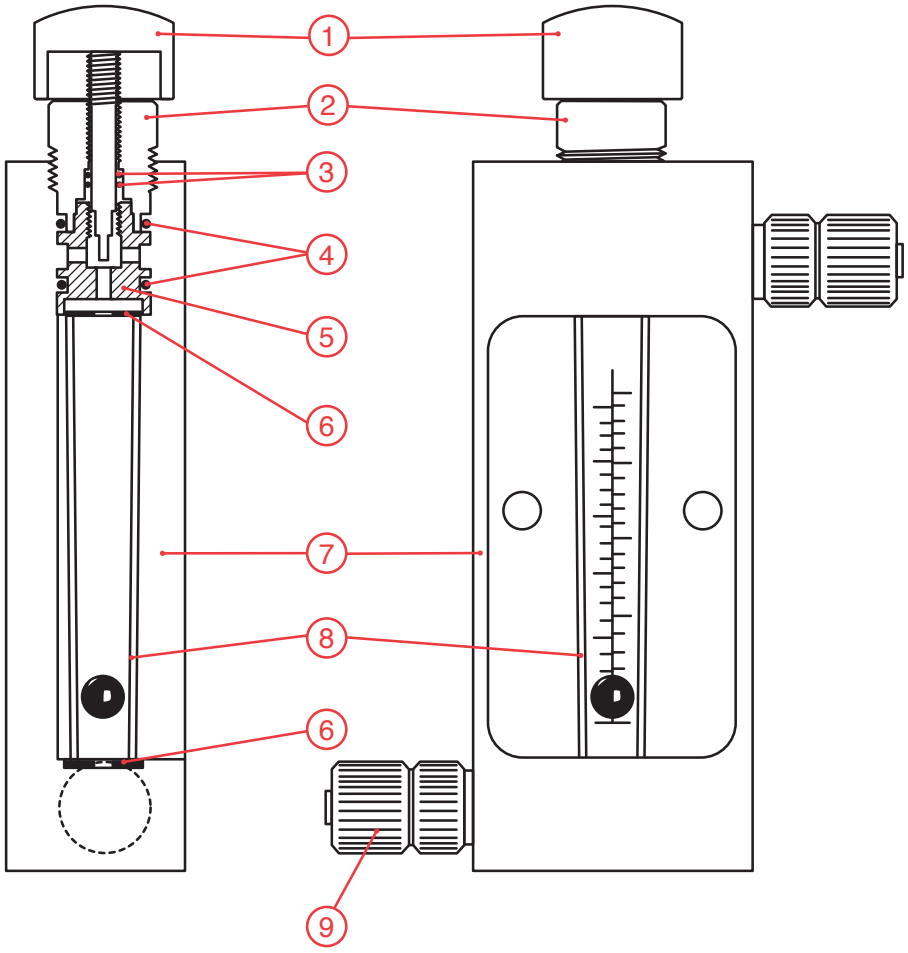
EJECTOR (O-RING)

Date: December 2006
Dwg. No. EJA-600



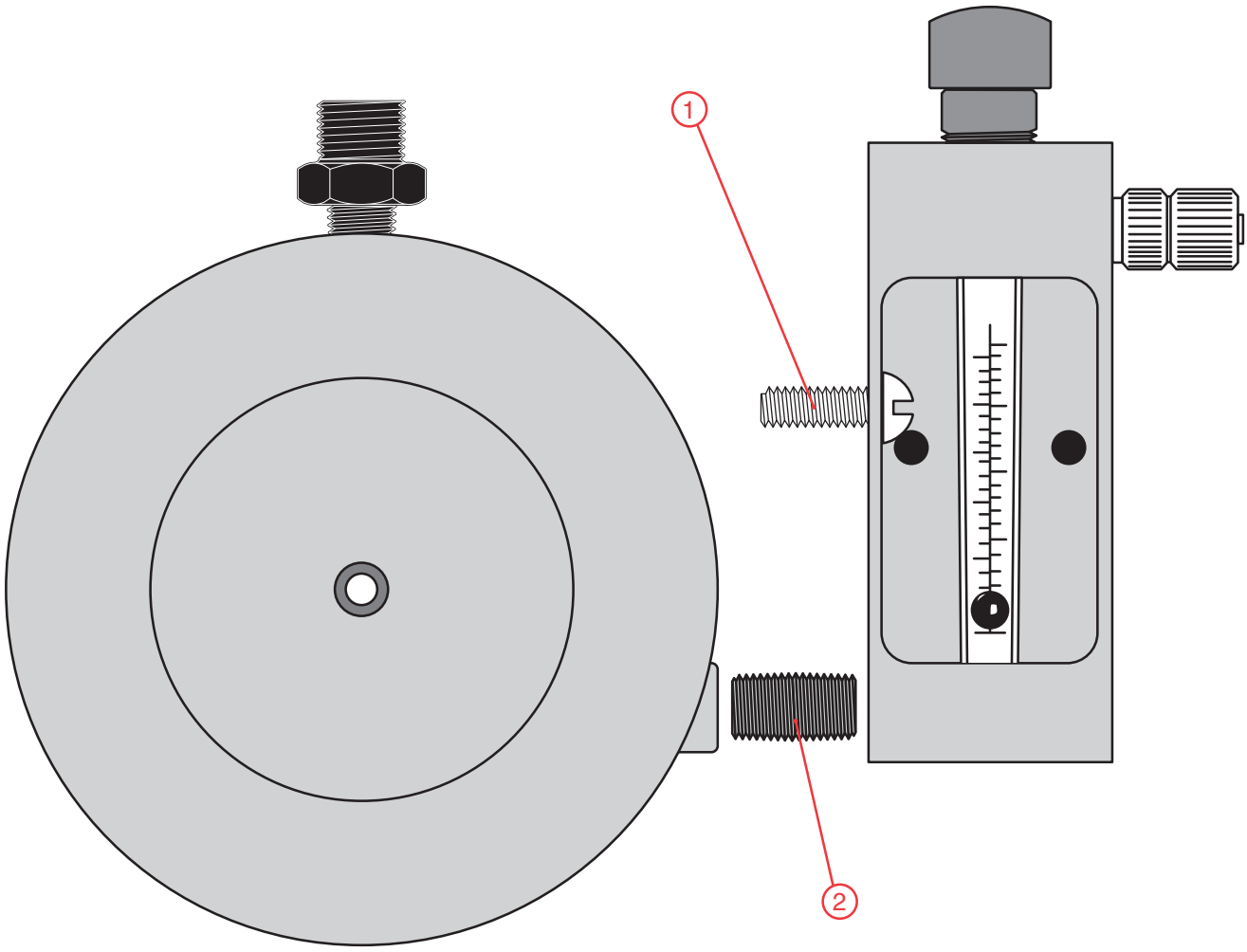
Item No.	Description	Part No.
1	Rate Valve Stem and Knob, 25 ppd	RVH-400-101
2	Rate Valve Bonnet	RVH-349-100
3	O-Ring (2)	OH-VIT-008 *
4	O-Ring (2)	OH-VIT-112 *
5	Rate Valve Sleeve, 25 ppd	RVH-350-101
6	Meter Gasket, 15 ppd max (2)	MG-001 *
7	Remote Meter Panel	MPH-448-100
8	Meter Tube, 15 ppd max	MTB-11
9	3/8" Tubing Connector (2)	BKF-64 *

Note: * These parts are included in PM Kit KT6-100-RMP.

AQUATECH Est. 1994

REMOTE METER (15 PPD)

Date: November 2006
Dwg. No. MPA-600



Item No.	Description	Part No.
1	1/4-20 x 3/4" Monel bolt	BTH-STA-189
2	1/4" NPT PVC close nipple	880-005

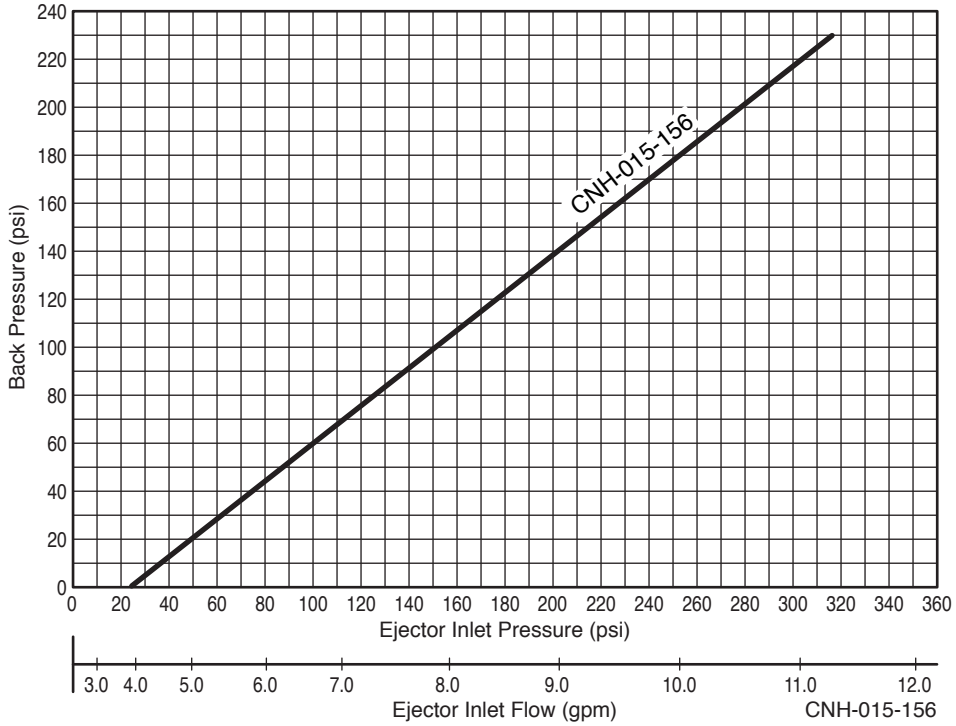
The Series 600 system provides the option of attaching the remote meter panel directly to the vacuum regulator for local feed control at the Chlorine cylinder. Included with each system is an accessory pack, which includes a pre-taped 1/4" NPT PVC nipple and a 1/4-20 Monel bolt. By removing the tubing connectors from the vacuum port on the vacuum regulator and the “gas in” port on the remote meter panel, the two can be connected with the nipple and bolt. Simply screw the remote meter panel onto the regulator using the close nipple until the bodies of each meet and secure them with the bolt provided. It is necessary to remove the glass meter tube in order to insert the 3/4" mounting bolt.

AQUATECH Est. 1994

ATTACHING THE REMOTE METER PANEL TO THE VACUUM REGULATOR

Date: December 2006
Dwg. No. RM-VR-001

NOZZLE SIZING CHART (15 & 25 PPD)



NOZZLE SIZING CHART (50 PPD)