



# Model VR6 System

## Installation, Operation & Maintenance

**General:** *All Archer Instruments chlorination systems are carefully designed and tested for years of safe, accurate field service. All Archer Instruments chlorination systems are carefully tested prior to shipment. All Archer Instruments 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.*

### **Safety:**

When working with chlorine, always use caution and follow applicable safety procedures. General safety considerations:

- \* Store chlorine separately from ammonia.
- \* When using chlorine, avoid locations that expose the cylinder and equipment to direct sunlight.
- \* Do not apply heater or heat source directly to chlorine cylinders.
- \* 150lb (upright) cylinders: Always keep cylinders upright and ensure the steel valve cap is in place when moving cylinders. Once cylinder is in place, a safety chain should be used to secure the cylinder.
- \* Ton Containers: Use appropriate handling equipment when moving ton containers. When readying ton container for use, ensure valves are aligned vertically. The top valve accesses gaseous chlorine and the bottom valve accesses liquid chlorine. The bottom valve should never be touched unless your system employs a chlorine heat exchanger (evaporator) designed expressly for use with liquid chlorine. When drawing gas from ton containers an appropriate ton container adapter and drip leg must be used (also available from Archer).

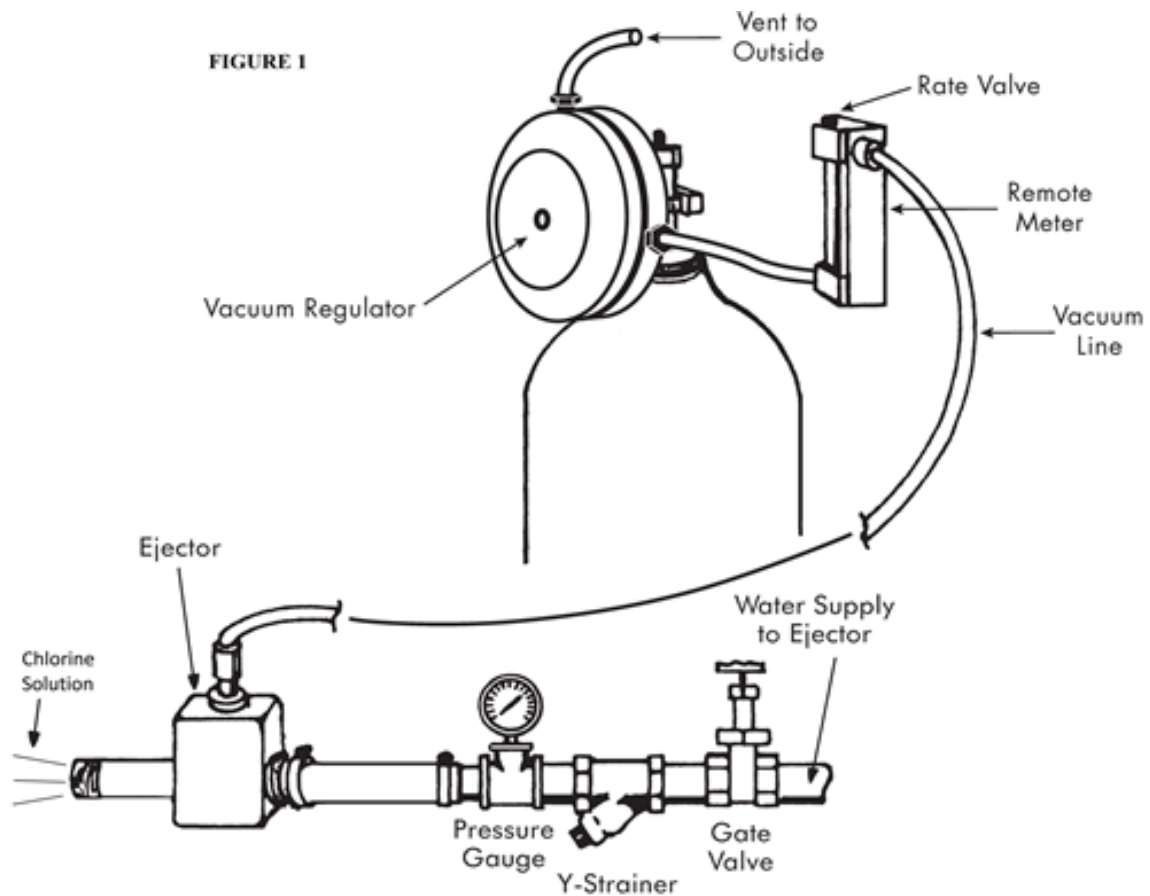
## **Installing the VR6 Vacuum Regulator:**

- 1) Carefully inspect the cylinder valve outlet surfaces and vacuum regulator inlet capsule surfaces for damage or debris prior to installation.
- 2) Note that the inlet port on the VR6 regulator ships with a filter cartridge installed. Do not remove this filter, as doing so will bring on maintenance requirements.
- 3) Always use a new lead gasket when connecting the vacuum regulator to a chlorine cylinder valve.
- 4) Holding the vacuum regulator upright, settle it over the cylinder valve and fit the inlet capsule into the cylinder valve outlet port.
- 5) Using a 3/8" wrench, tighten the yoke assembly "half-dog" set screw so that the lead gasket is crushed between the valve and the inlet capsule.
- 6) Connect the vent and vacuum tubing to the regulator (these are labeled). See Figure 1.

**NOTE:** Vent tubing should always be connected and run to a safe location (outside of any building). A vent bug cap (provided with every Archer vacuum regulator) should be fitted over the end of vent tubing to prevent insects from entering the equipment.

## **Installing the Remote Meter:**

- 1) The remote meter panel is typically installed on a wall or panel using the two pre-drilled mounting holes found on the meter body. However, the VR6 design allows for mounting the remote meter directly to the VR6 vacuum regulator, using the 1/4" pipe nipple and mounting screw, which are include in your accessory pack.
- 2) The remote meter panel must be installed in the system between the vacuum source (ejector) and the gas source (chlorine cylinder / vacuum regulator). Refer to Figure 1.
- 3) Note that the gas flows up through the remote meter panel, and from the chlorine cylinder to the ejector. The top tubing connector is connected to the ejector (vacuum source) and the bottom tubing connector to the vacuum regulator.
- 4) Once the remote meter panel is mounted and the tubing connected, it can be used to perform a quick check on the system for vacuum leaks. By operating the ejector with the chlorine cylinder valve(s) shut, the ball in the remote meter panel should settle at the bottom and not move. If the ball continues to float or if it continually bounces, a vacuum leak is indicated in the system.



## **Operating the VR6 Vacuum Regulator:**

- 1) Prior to placing the vacuum regulator into operation, it is important to carefully test the lead gasket seal. A small squeeze bottle (provided with every Archer vacuum regulator) should be partially filled with ammonia. Squeezing the bottle allows the ammonia fumes to be used to test for chlorine leaks. A leak is detected by a visible light gray / white gas cloud when the two fumes interact. To test for leaks, open the cylinder valve 1/3 turn and then close immediately. This pressurizes the lead gasket seal but ensures the full cylinder of chlorine is isolated during leak testing. Use ammonia fumes around the cylinder valve and lead gasket to check for any signs of leaking gas. If a leak is found, this must be addressed before placing the unit into operation.
- 2) After confirming no leaks exist, open the chlorine cylinder valve 1/3 of a turn. This is fully open and there is no need to open the valve further.
- 3) If the remote meter is not mounted on the VR6, no further action is needed.
- 4) If the remote meter is installed on the VR6, adjust the remote meter's rate valve knob until the desired feed rate is indicated on the graduated meter tube.

## **Operating the Remote Meter:**

- 1) Once installed and connected, the remote meter panel is placed into operation by opening the cylinder valves and operating the ejector.
- 2) Turn the rate control knob until the desired feed rate is indicated.

NOTE: The rate control valve is not designed to be used as a shut-off valve. To shut off gas feed, shut off motive water to the ejector.

## **Maintaining the VR6:**

Recommended Maintenance Frequency: Archer recommends yearly routine maintenance.

-Refer to the parts diagram when performing maintenance on the VR6.

- 1) To disassemble, remove the two yoke screws and pull the metal yoke & inlet assembly out of the back of the vacuum regulator.
- 2) Remove the four body screws and separate the front and back bodies. The diaphragm assembly can then be removed by carefully pulling it straight out of the front body. Take care to not lose the vent spring, which is located between the diaphragm assembly and the front body.
- 3) The guide pin is threaded into the rear diaphragm plate and should not need to be removed during routine maintenance.
- 4) The rear diaphragm plate and front diaphragm plate are threaded together and can often be unscrewed by hand. If they will not unscrew by hand, it may be necessary to use a vice and / or channel locks. Unscrewing these two parts allows for the removal of the diaphragm.
- 5) Whenever routine maintenance is being performed, all parts should be thoroughly cleaned. It is recommended that all o-rings (with the exception of the OA-VIT-332) be replaced.
- 6) When reassembling, new o-rings should be given a thin film of the Fluorolube grease.

**NEXT:** The inlet assembly is a critical component in the safe function of the vacuum regulator. Improper handling or reassembly can result in dangerous leakage of chlorine gas.

**Archer recommends that only trained personnel or those familiar with vacuum regulator maintenance service the inlet assembly.**

To service the inlet assembly:

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 back body.
3. Remove the OA-VIT-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 YMA-100A Inlet Valve Stem from the VRA-601A Spring Retainer.  
NOTE: Protect the VRA-601A Spring Retainer 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 VRA-601A, YMA-100A and SPA-104 should be removed and cleaned.

NOTE: Especially clean the YMA-100A in the region where it meets the YPA-101A to form the seal. This surface should be polished as smooth as possible without scratching the surface.

7. Using a rod of 0.250" diameter, the YPA-101A Inlet Valve Seat can be pressed out of the Seal Plug from the spring side. The YPA-101A should be cleaned and carefully inspected for scratches or cuts especially where it is to seal with the YMA-100A.

NOTE: Sometimes the YPA-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 YPA-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 Fluorolube™ grease.
  - b. Insert the new or cleaned YPA-101A with O-Ring OA-VIT-010.
  - c. Insert and retighten the YMA-100A, VRA-601A and SPA-104 as shown in the drawing.

NOTE: DO NOT USE EXCESSIVE FORCE IN TIGHTENING the YMA-100A to the VRA-601A.

- d. Insert a new Filter Cartridge.
- e. Install a new OA-VIT-214 O-Ring on the Seal Plug.

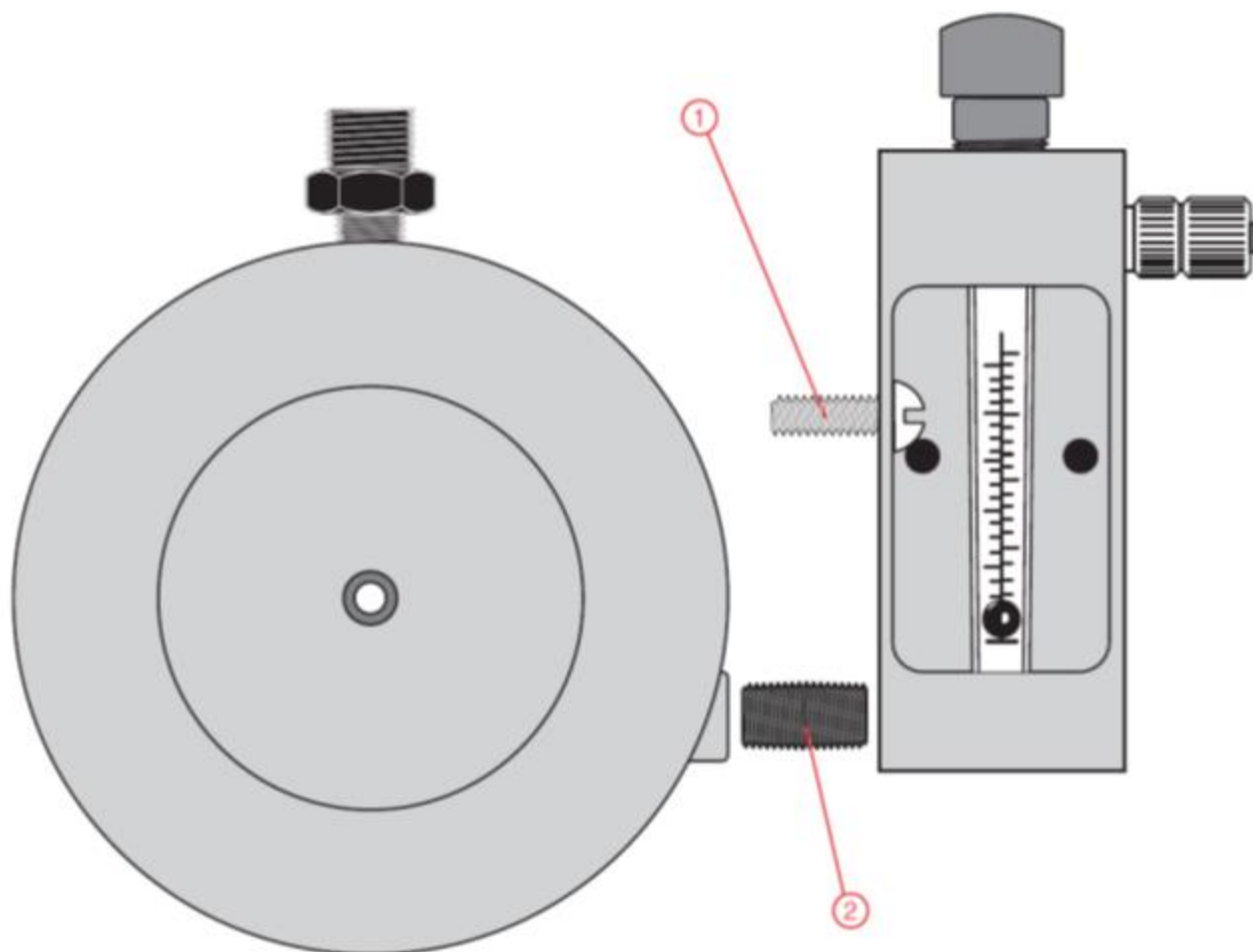
*-Should you have any questions during maintenance of your vacuum regulator, please contact your local service provider or Archer for support.*

## **Maintaining the Remote Meter:**

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 OA-VIT-008 O-Rings on the rate valve stem by separating the valve bonnet and sleeve.
4. Lubricate the new O-Rings lightly with Fluorolube grease before replacing the sleeve, bonnet and rate valve.

## **Cleaning The Glass 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 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.



Item No.	Description
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1	1/4-20 x 3/4" bolt
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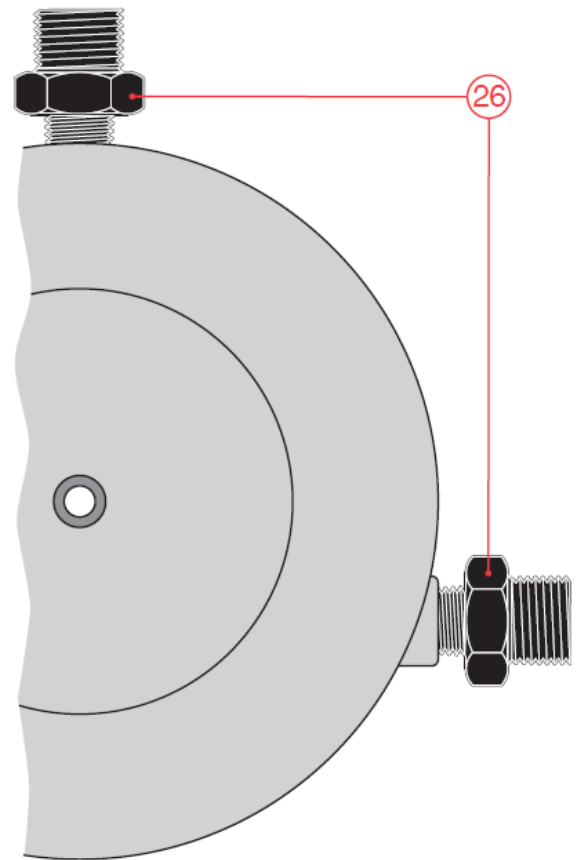
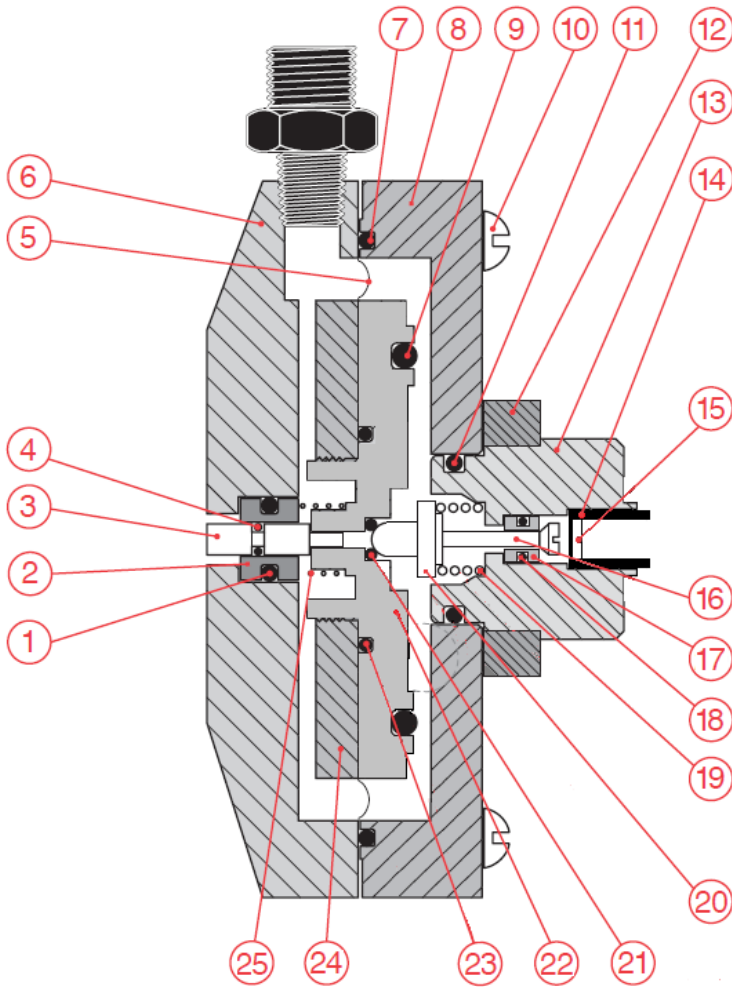
2	1/4" NPT PVC close nipple
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The system provides the option of attaching the remote meter panel directly to the vacuum regulator for local feed control at the Chlorine cylinder. Included with each system is an accessory pack, which includes a pre-taped 1/4" NPT PVC nipple and a 1/4-20 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.

**ATTACHING THE REMOTE METER PANEL  
TO THE VACUUM REGULATOR**

**SIDE VIEW**

**FRONT VIEW (Partial)**



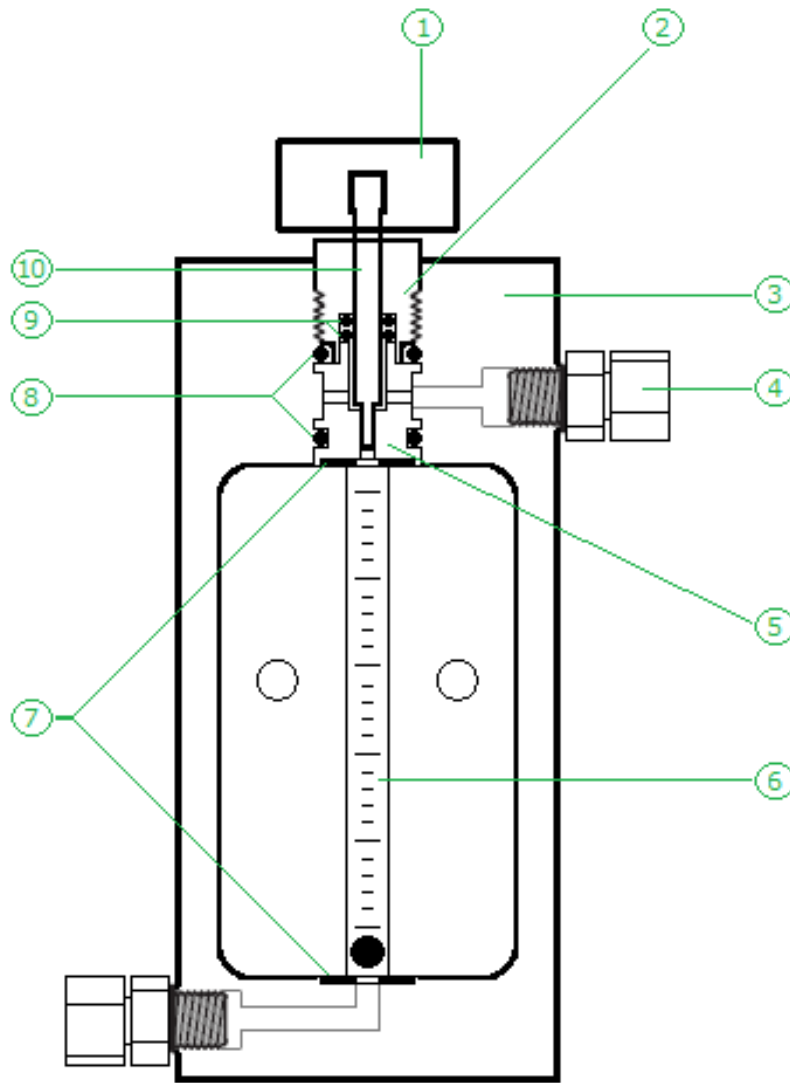
Item#	Qty.	Part #	Description	Item#	Qty.	Part #	Description
1	1	OA-VIT-014	O-Ring *	14	1	KFA-300	Filter Holder
2	1	VRA-104	Pin guide	15	1	VRA-5015	Filter *
3	1	VRA-600	Guide Pin	16	1	YMA-100A	Inlet Valve
4	1	OA-VIT-006	O-Ring *	17	1	YPA-101A	Inlet Valve Seat *
5	1	DPA-103	Double Diaphragm *	18	1	OA-VIT-010	O-Ring *
6	1	FBA-600	Front Body	19	1	SPA-104	Inlet Spring
7	1	OA-VIT-156	O-Ring	20	1	VRA-601A	Spring Retainer
8	1	BBA-600	Back Body	21	1	OA-VIT-009	O-Ring *
9	1	OA-VIT-332	O-Ring	22	1	VRA-56A	Rear Diaphragm Plate
10	4	BTA-123	Body Screws (Monel)	23	1	OA-VIT-029	O-Ring *
11	1	OA-VIT-214	O-Ring *	24	1	VRA-269	Front Diaphragm Plate
12	1	YMA-605A	Back Plate	25	1	SPA-100	Vent Spring
13	1	SAWS-US3	Seal Adapter	26	2	TCA-64	¼" NPT x 3/8" tube connector *

**Notes:** \* - These parts are included in the Parts - Maintenance Kit KT6-10C



Date: Feb 2016  
Drawing: VR6





Item#	Qty.	Part #	Description	Item#	Qty.	Part #	Description
1	1	RVA-402	Knob	6	1	MTA-108-XXX	Meter Tube 004 / 010 / 025 / 050 / 100 = PPD
2	1	RVA-349	Rate Valve Bonnet	7	2	MGA-X	Meter Gasket 1 / 2 / 3 10, 25, 100 PPD
3	1	MPA-447	Meter Body	8	2	OA-VIT-112	O-Ring
4	2	TCA-64	Tubing Connector	9	2	OA-VIT-008	O-Ring
5	1	RVA-351	Sleeve 25 PPD & below	10	1	RVA-418	Stem 25 PPD & below
or...		RVA-350	Sleeve 50 & 100 PPD	or...		RVA-665	Stem 50 & 100 PPD

**Notes:** Vacuum Tube Connector supplied for 3/8" tubing.  
Tap size is 1/4" NPT.



Date: Feb 2016  
Drawing Number: MPA-6