OWNER'S MANUAL

FOR THE

BatchBoy

CLOSED TRANSFER SYSTEM

FOR

AGRICULTURAL CHEMICALS

PUMP SYSTEMS L.L.C
"THE PROBLEM SOLVERS"

530 25th. Ave. E., P.O. Box 1940, Dickinson, ND 58601
Ph (701) 225-4494 • Fax (701) 225-0320 • Ph 1-800-437-8076
email address: psi@pumpsystems.com

IMPORTANT

YOU MUST COMPLETELY READ AND FULLY UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING, OPERATING, OR SERVICING THIS UNIT.

Be sure you have read all other applicable installation, operation, maintenance, and safety manuals, as well as these instructions before you install, service or begin to operate this unit.

Accidents occur every year because of careless use of equipment. You can avoid hazards by following these safety instructions, and applying some ordinary common sense when operating or servicing this unit.

Keep in mind that **full operator attention and alertness** are required when operating or servicing this unit.

Use common sense! Most accidents can be avoided by using **common sense and concentrating** on the job being done.

To avoid personal injury or death, read and thoroughly understand the following safety instructions plus the entire operating and service manual before moving, installing, operating, or servicing this unit. Failure to heed the danger notices may result in an accident causing physical damage or harm, serious personal injury, or death!

Provisions should be made to have these written instructions along with the unit operating and service manuals readily available to all operator and service personnel.

These written instructions should be **reread periodically** by both the operator and the maintenance personnel to refresh their memories in safe procedures and practices.

These instructions cannot possibly cover every situation concerning the safe installation, operation, inspection, servicing, adjustment, and testing of this unit or handling of chemicals. In furnishing these instructions, we insist that the operating and maintenance personnel using this unit have sufficient technical knowledge and experience to apply sound safety and operational practices which may not be otherwise mentioned. **Safe installation, operation, and maintenance must be performed by qualified personnel**.

Read all chemical container labels for precautions, instructions, and remedies. Also familiarize yourself with any local or state regulations concerning safety when handling agricultural chemicals

NEVER WORK ON A UNIT WHILE IT IS BEING USED.

* Read and understand warning tags, danger notices, decals and installation and operation manuals as well as these safety instructions.

* Danger notices, decals, and warning tags must never be removed, painted over, hidden, or defaced in any way. They must be replaced if damaged or unreadable.

* Only qualified, experienced personnel should install, operate, or service this unit.

* Always wear all required safety clothing and equipment, including shoes, gloves, body suit, face shield, respirator, and goggles when installing, operating or performing maintenance on this unit to help prevent injury to your body from pressurized fluids, spills or splashes of chemicals, hazardous vapors, or falling or flying objects.

BEFORE OPERATING THIS UNIT

* Know all operating conditions and limitation of this unit and its associated system. Do not attempt to operate, or service this unit, or it□s associated system, if any part of the system will be operating beyond its limitations.

* Do not modify this unit to function beyond its specifications.

* Secure the unit so it does not tip over, jump, roll, slide, or fall.

* Make certain that the unit and all piping connections are tight, properly supported, leak free, and secure before operating.

DANGER

* Do not handle liquids that are **not compatible** with the materials of construction of this unit, or liquids which may damage this unit or endanger personnel as a result of this unit's failure.

* Do not handle **flammable or corrosive** liquids with this unit. Leakage of flammable or corrosive liquids that may occur from this unit could create fires or explosions, causing very serious injury or death.

* Do not operate this unit **in excess of its rated capacity, pressure, speed, and temperature** or the unit may fail causing serious injury or death.

DANGER

* Fluids under **high pressure** can posses sufficient energy to cause personal injury or death. Always use hose or pipe that is designed for your particular pressure requirements. Inadequate hose or piping could burst resulting in serious injury or death.

* Be mindful of the potential of whipping hoses during operation.

BEFORE SERVICING THIS UNIT

* A p proach cautiously any unit that is or recently has been in operation. Identify all possible hazards and implement appropriate safeguards for each possible hazard.

* Only qualified, experienced personnel should service this unit.

* Always wear safety clothing and equipment, including shoes, gloves, body suit, and goggles, when performing maintenance on this unit to help prevent personal injury to your body from pressurized fluids, spilled or splashed chemicals, hazardous vapors and falling or flying objects.

* **Before attempting to do any work on this unit:**

A Familiarize yourself with these instructions plus the operation and service manuals.
B Alert other personnel that you will be working on this unit so that they may move to a safe location.
C Check to be sure you are on safe footing when operating or working on this unit.
D Vent the unit to relieve any pressure that may be trapped in the unit.
E Thoroughly flush the unit to rinse out all chemicals.
F Drain all liquids out of the unit.
G Make sure the unit is secure so it does not tip over, jump, roll, slide, or fall.

LIFTING AND MOVING

* When lifting this unit, use only lifting equipment in good condition and with adequate capacity. Make sure lifting device□s fasteners are tight and secure.

SPILLAGE OR LEAKAGE

* Proper measures and precautions must be taken to avoid spillage or overflow from overfilling or over pressurization of any component of the system.

* Determine the consequences of spillage or leakage of the liquid being pumped: A) explosive; B) toxic; C) corrosive; D) flammable; E) chemical burn; F) high temperature; G) high pressure; H) hazardous vapors; I) others.

* Have in place appropriate safeguards against potential spillage or leakage, and other hazards with: A) proper personnel safety clothing and equipment; B) pressure controls; C) leak detectors; D) shutoff devices; E) high or low pressure safeguards (relief valves); F) alarm devices; G) overfill / overflow detection; H) others.

* **Have a supply of clean, fresh water in place. In the event of a spill or leak, it can be used to wash your hands, face, or to flush your eyes.**

SOLVENTS

* Most solvents are **highly flammable**. Use extreme care when using solvents to clean this unit or parts. Observe all safety instructions on packaging. **Fires or explosions** could result, causing serious burns, or death.

* Most cleaning solvents are **toxic and flammable**. Use only in a well ventilated area, free from excess heat, sparks, and flames. Read and follow all precautions printed on solvent containers.

Identify all possible hazards. Determine what safeguards are needed and implement them. **Only you, the user**, understands your product and system characteristics fully. **The ultimate responsibility for safety is with you**. **Your safety ultimately rests in your hands**, ***so do your part*** and you can enjoy a safe, trouble-free environment for years to come.

Thank you for purchasing a ***BatchBoy*** closed transfer system for agricultural chemicals.

We trust you will find your ***BatchBoy*** safe and simple to use while accurately measuring and transferring chemicals into your sprayer tank. While the ***BatchBoy*** is a much safer method of handling chemicals, the potential for exposure to chemicals and their vapors still exists. Therefore, we insist you protect yourself from these hazards by wearing and using safety clothing and other safety equipment.

Warning -*Handling chemicals is dangerous. Exposure to chemicals or their vapors can be hazardous to your health and safety. Please refer to the safety section of this manual for further instructions.*

Please read this manual before installing or using the ***BatchBoy*** to familiarize yourself with it's intended use, operation, and maintenance.

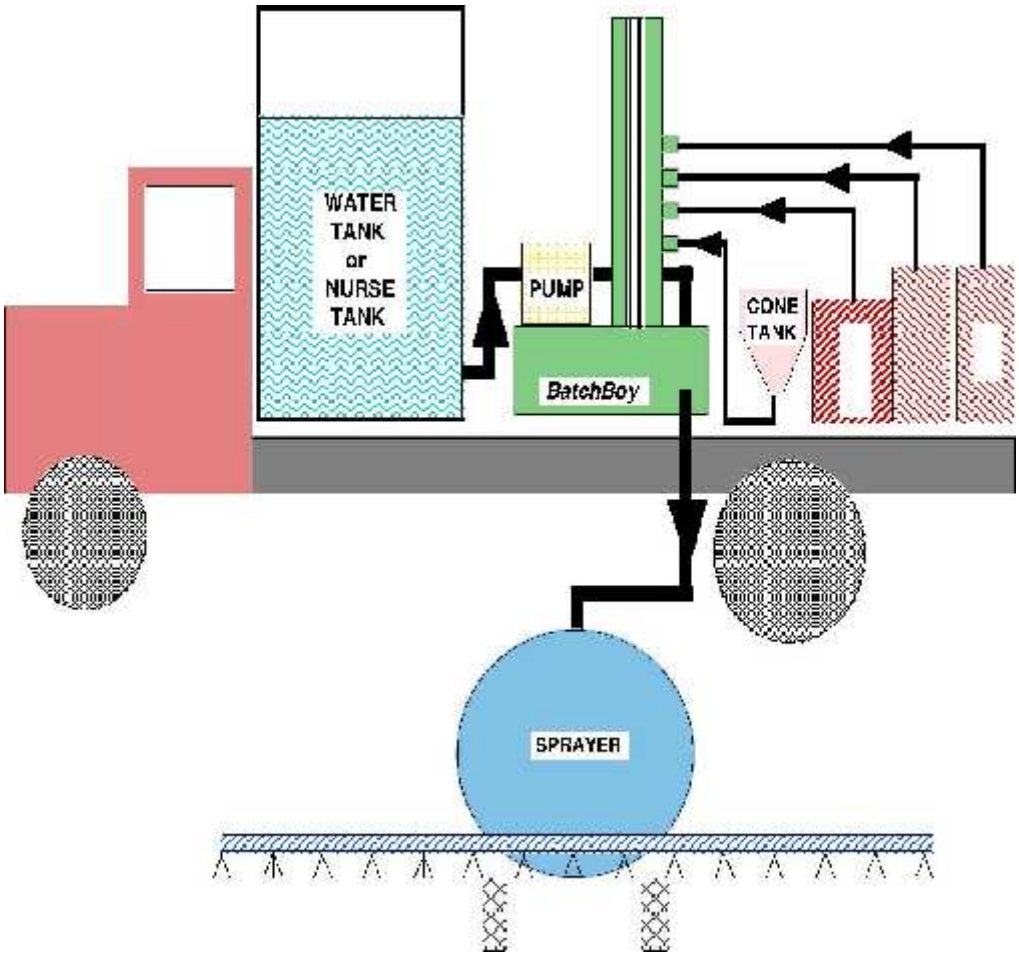
Intended Use

The ***BatchBoy*** is designed and manufactured to transfer agricultural chemicals from their source container into a sprayer tank, and while transferring the chemicals, to accurately measure the volume of chemical being transferred.

The ***BatchBoy*** needs to be installed in series within your sprayer tank filling system, with the stream of water passing through the ***BatchBoy*** on it□s way to your sprayer tank. This water passing through the unit is the sole energy source for the ***BatchBoy.*** No other power source is required

The ***BatchBoy*** creates a vacuum with a venturi style vacuum generator. As water passes through the unit, it is directed through the venturi and causes the venturi to create a vacuum.

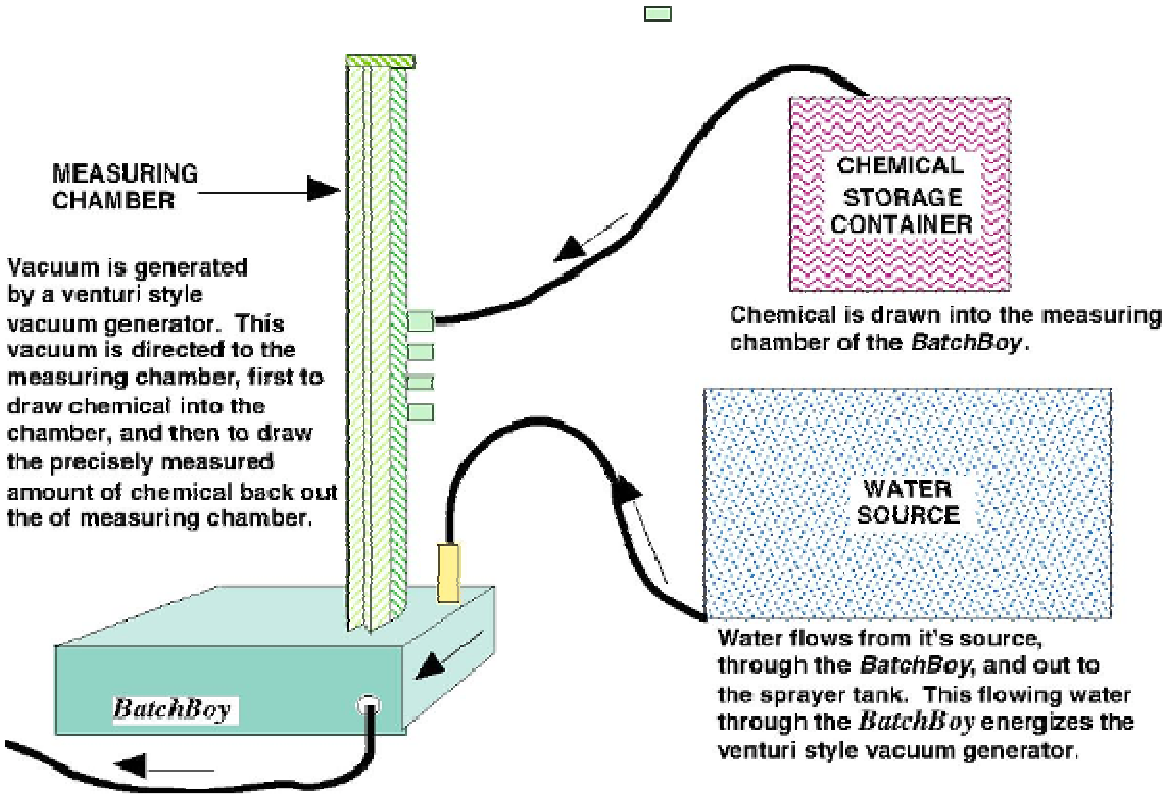
The ***BatchBoy*** uses this vacuum to draw the chemical out of it□s container, and



transfer this chemical into the measuring chamber of the ***BatchBoy***. Once the desired amount of chemical is drawn into the measuring chamber, the ***BatchBoy*** uses this same vacuum source to remove the precisely measured amount of chemical from the measuring chamber and mix this chemical with the water that is passing through the unit to your sprayer tank.

The ***BatchBoy*** measures chemical by true volume. Chemical is drawn into a measuring chamber fitted with a sight tube which is graduated and calibrated. Only liquid volume is measured.

A rinse feature is designed into the ***BatchBoy*** to rinse the measuring chamber and it's sight tube. Rinse water is sent up the sight tube and into the measuring chamber to wash down the inside of the chamber.



Inspection

of your new *BatchBoy*

Visually inspect your new machine before installing or using it to make sure there are no missing components or obvious damage.

Along with the unit you should find a plastic bag containing this manual, three elbows to be used as needed on the chemical valves, and a valve to be installed on the unit as a **Water Valve**.

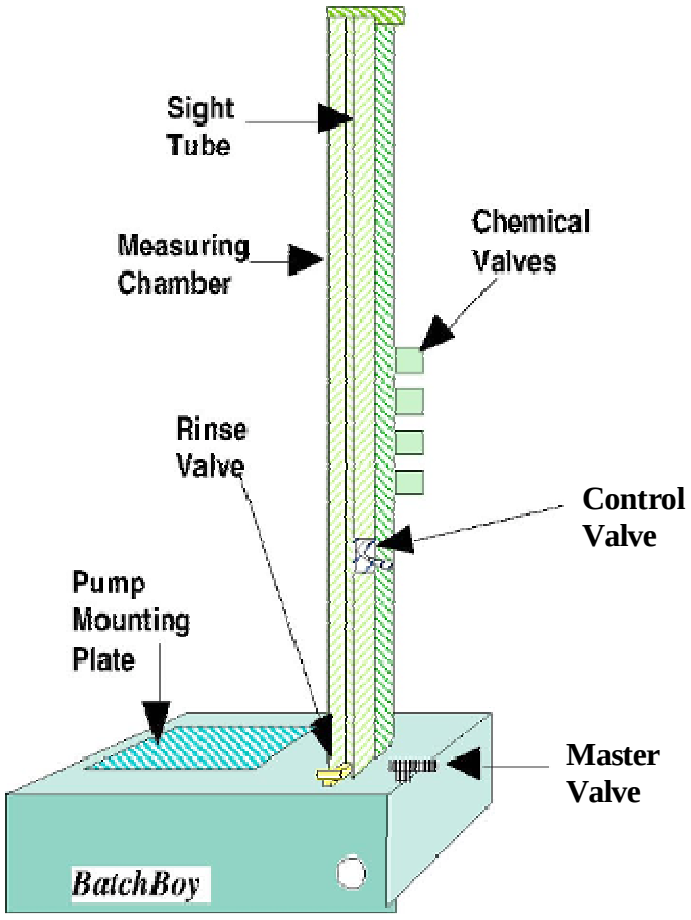
Following is a list of items you should inspect at this time.

Sight tube - in place and not broken.
Vacuum gauge - in place, not broken.
Calibration scale - Readable, not defaced.
Chemical valves -handles operate.

Master valve - operates, handle is not broken.
Rinse valve -operates.
Control valve - operates, latches in the EMPTY position.
Measuring chamber - not dented.

Base - no dents, not bent or deformed.
Pump mounting plate - attached to the base with 4 rubber vibration isolation mounts.
Plumbing underneath - all hoses connected, all clamps tight, no broken fittings.

If you find something wrong or missing, please contact your local dealer or Pump Systems, L.L.C. 1-800-437-8076.



Installation

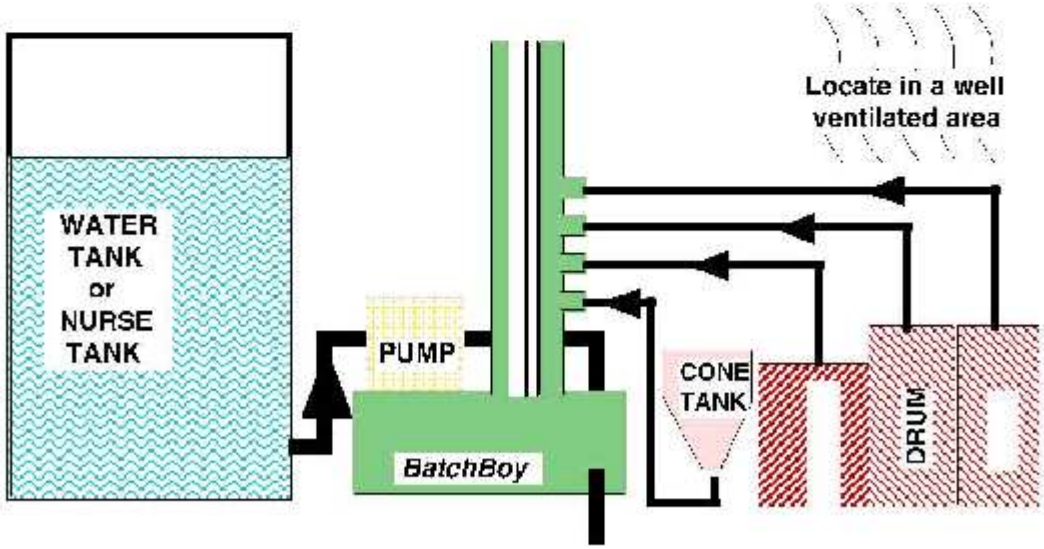
When installing your new ***BatchBoy***, keep in mind that this unit is used in conjunction with handling agricultural chemicals and the potential for exposure to these chemicals and their vapors does exist.

Warning - *Handling chemicals is dangerous. Exposure to chemicals or their vapors can be hazardous to your health and safety. Please refer to the safety section of this manual for further instructions.*

LOCATION

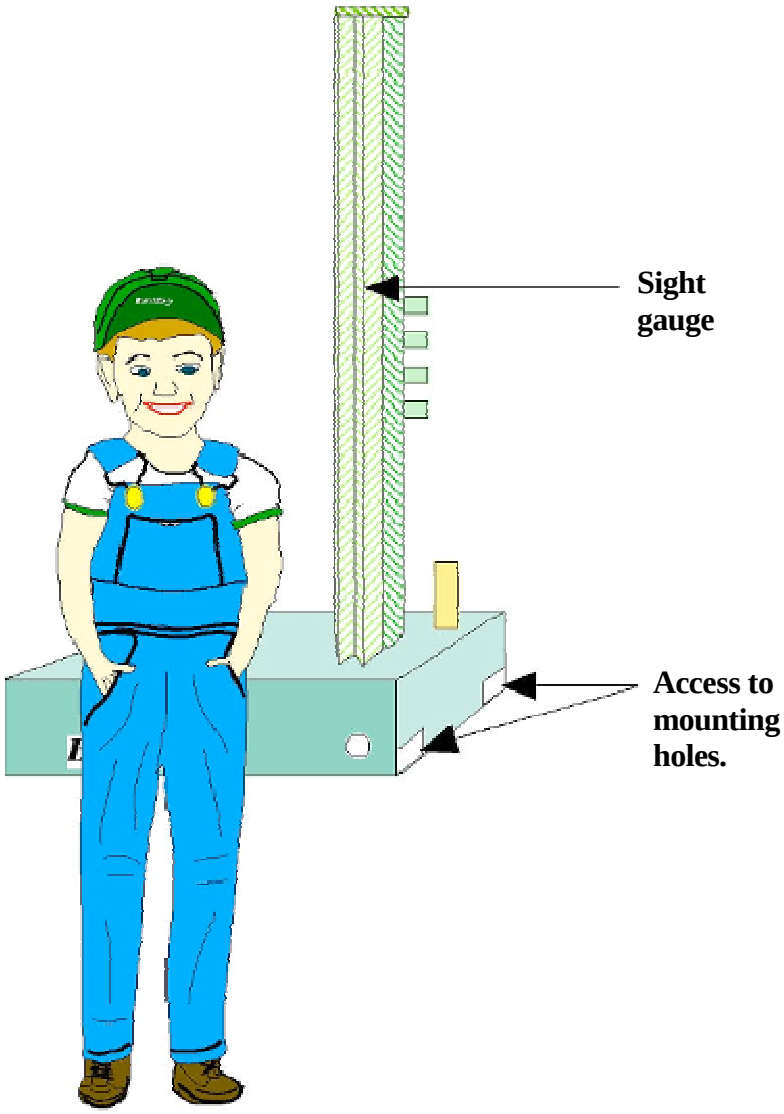
The ***BatchBoy*** should be installed in a well ventilated area where fumes and vapors will not accumulate or be trapped.

Position the ***BatchBoy*** in such a way that the operator can easily approach the machine to operate it, as well as allowing the operator an escape route away from the machine in case an emergency situation arises.



The ***BatchBoy*** should be installed at a height that allows the operator to see the full sight tube without undo stress. Generally a comfortable level is to have the base of the unit at waist height. A sturdy step stool may come in handy for seeing the top portion of the sight tube.

Install the ***BatchBoy*** on a flat, stable surface and secure the unit to this surface so it does not tip over, jump, slide, roll or fall. Mounting holes are provided in each corner of the base of the unit for bolting the unit down.



Keep in mind the routing of plumbing hoses and connections. The best route for plumbing is the shortest and most direct route. Each bend, extra elbow , or extra length of hose tends to slow down the flow of liquids, thus deteriorating the performance of the machine.

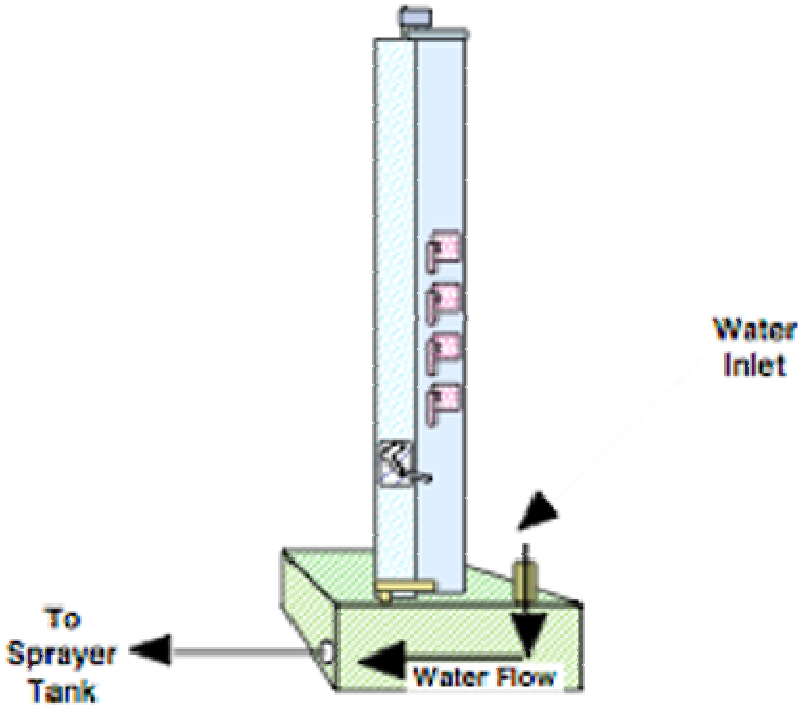
WATER SOURCE

The ***BatchBoy*** needs to have water passing through itself in order to generate vacuum to operate. The minimum flow requirement is 15 gpm at 25 psi.

Most 1 1/2", 2", or 3" water transfer pumps will provide plenty of water to the unit.

The ***BatchBoy*** needs to be installed in your plumbing system in such a way that water from your water source passes through the unit on it's way to your sprayer tank.

If you fill your sprayer with a garden hose, the hose must supply at least 15 gpm at 25 psi in order to operate the unit.

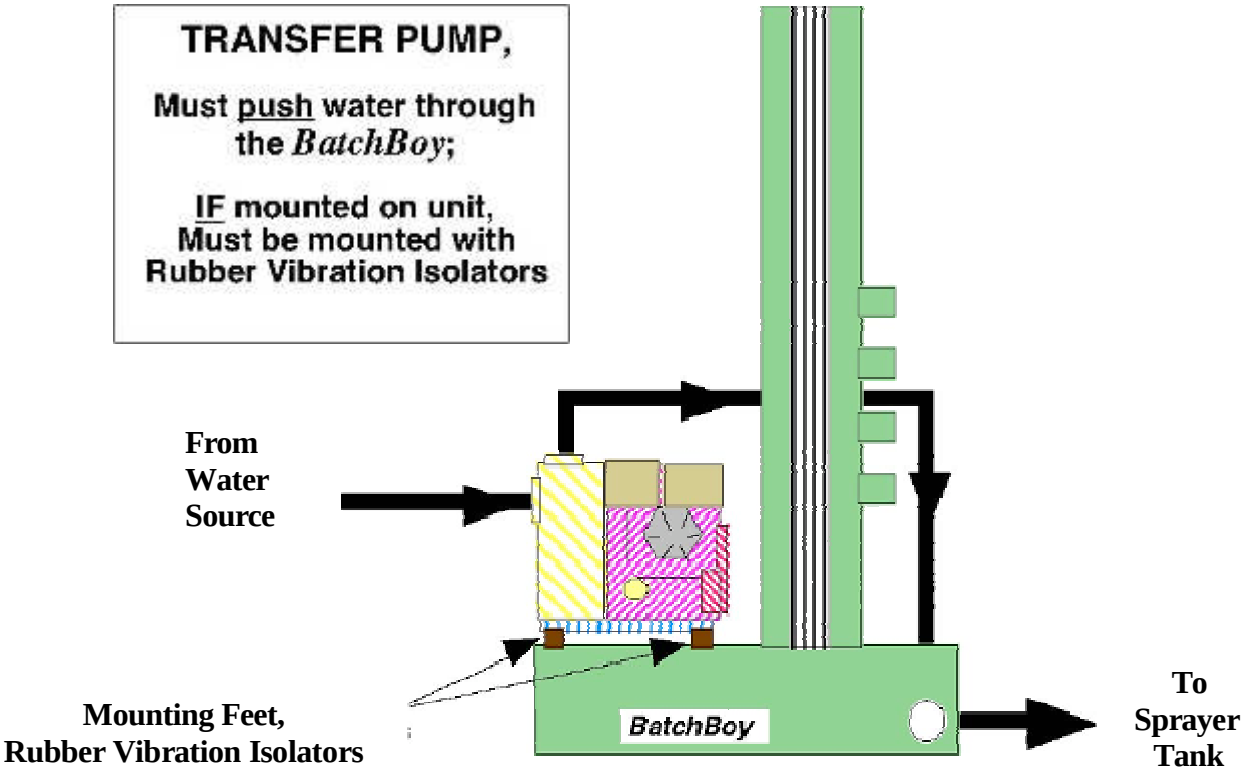


TRANSFER PUMP

If you use a nurse tank and transfer pump system to fill your sprayer, the ***BatchBoy*** needs to be installed in your plumbing system downstream of the transfer pump. Your transfer pump must push water through the ***BatchBoy***.

The ***BatchBoy*** is provided with a pump mounting plate for your convenience. You may mount your water transfer pump to this plate. The plate is pre drilled for most 3 hp, 5 hp, and 8 hp gasoline engines. Do not mount a transfer pump directly to the base of the ***BatchBoy*** . The vibrations from the engine can cause premature failure of the sight tube. If the provided mounting plate does not work, you may use your own. Remember to mount your plate to the ***BatchBoy*** using the rubber vibration isolator mounts.

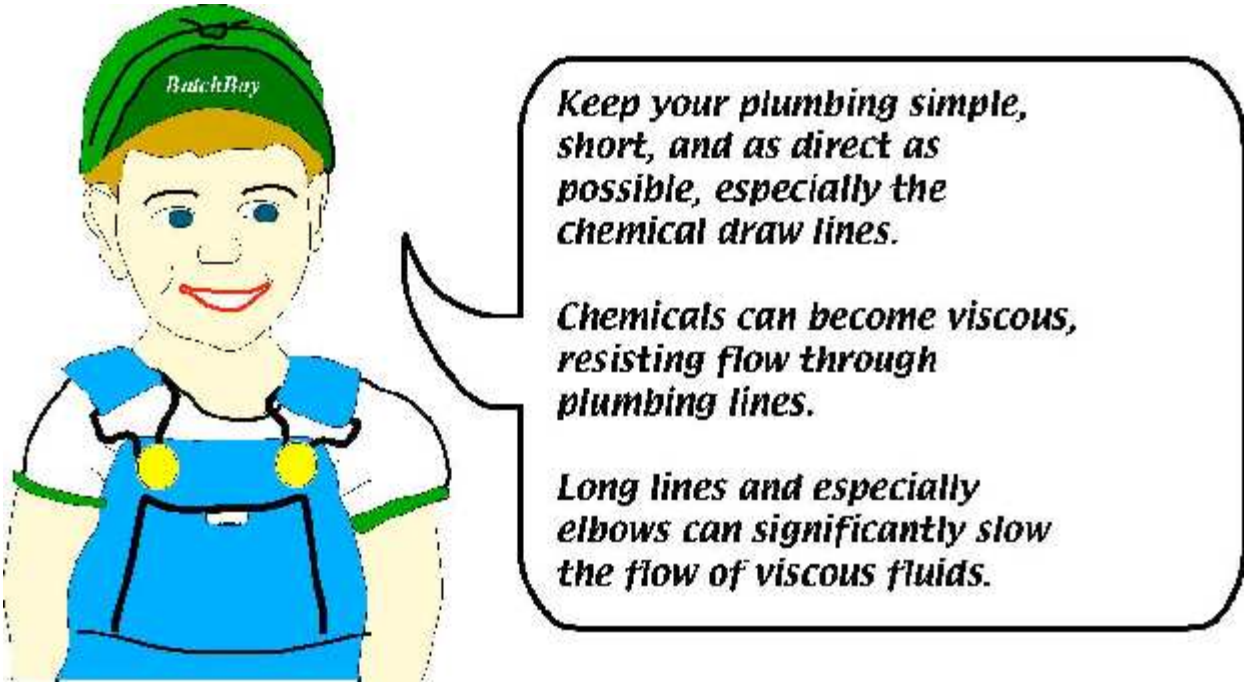
If the position of the mounting plate does not work for you, new holes may be drilled into the ***BatchBoy*** base so that the mounting plate can be oriented for your situation. When drilling holes into the base of the unit, take care to not drill into any of the plumbing or other components found under the base of the unit.



PLUMBING

Keep in mind that the shortest and most direct route for plumbing is the best. This is particularly true for chemicals as they are more viscous then water. Each extra elbow, bend in the line, or extra length of line tends to add resistance to the flow of liquids. This resistance to flow can become substantial as the liquid becomes more viscous. Some agricultural chemicals become very viscous when they are cold, thus being very resistant to flowing through lines and around elbows.

Plumbing lines leading from chemical containers to the ***BatchBoy*** measuring chamber should be 1" diameter hose or pipe, rated for a full vacuum and at least 75 psi, and compatible with the chemical you will be transferring These lines should be direct and short, using as few elbows as possible. Avoid having these lines rise and fall in elevation, as these hills and valleys in the lines can trap air or hamper draining the lines empty. Lines must be leak free and air tight.



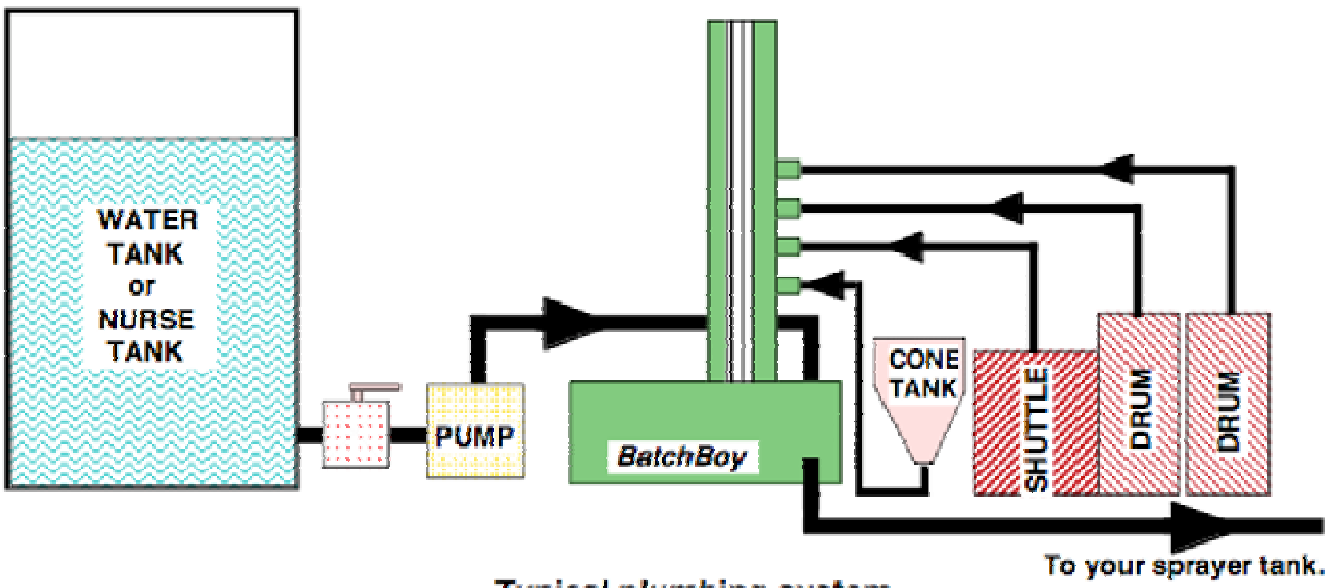
If you are mounting the ***BatchBoy*** on a truck or trailer it is a good idea to use a flexible line, such as a hose, between the chemical containers and the ***BatchBoy***. This will allow some independent movement between the unit and the chemical containers.

The clean, fresh water you use to fill your sprayer tank must pass through the ***BatchBoy*** on it's way to the sprayer tank. The inlet for this water is the 3" manifold fitting near the back of the unit. You need to plumb your water source to this inlet.

We recommend having a shut off valve in the line between your water source and the ***BatchBoy***.

You will need to attach a hose to the outlet of the ***BatchBoy*** that will be used to fill your sprayer tank.

All plumbing, piping, and hoses should be supported and secured so that they do not hang or tug on the ***BatchBoy***, your pump, the chemical containers, or your nurse tank.



Typical plumbing system

O P E R A T I O N

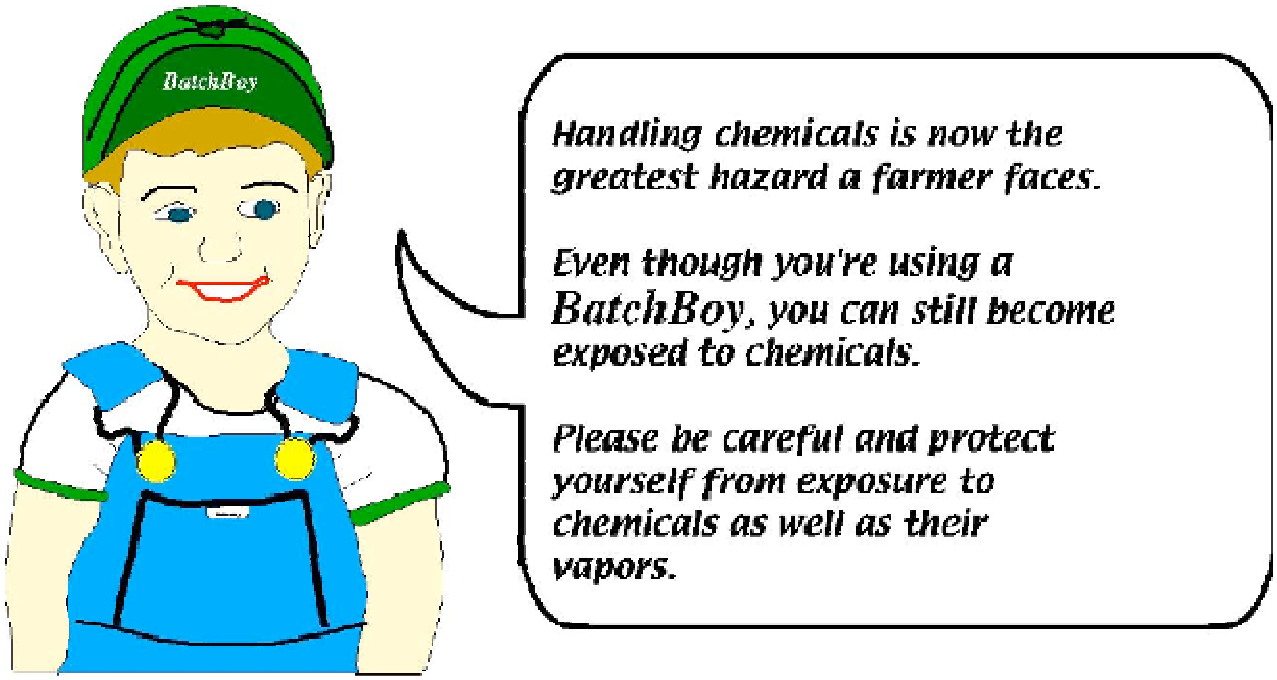
SAFETY

Only qualified, experienced personnel should operate the ***BatchBoy*** giving it their full attention and alertness. We insist that the operating personnel using this unit have sufficient technical knowledge and experience to apply sound safety and operational practices

Be aware that when operating this unit, the operator will be involved in handling agricultural chemicals and their vapors, putting the operator in a potentially dangerous environment. The operator may become exposed to chemicals and their vapors, and the operator may be in harms way from pressurized fluids, squirts, leaks, spills and splashes.

Use common sense and extreme care when operating this unit.

Warning -Handling chemicals is dangerous. Exposure to *chemicals or their vapors can be hazardous to your health and safety. Please refer to the safety section of this manual for further instructions*.



Before operating the ***BatchBoy*** be sure to protect yourself by wearing all required safety clothing and equipment, including shoes, gloves, body suit, face shield, respirator, and goggles.

Keep a supply of fresh, clean water handy. This water can be used to wash or flush chemical off your body, or to flush your eyes in the event of an exposure.

Wear Personal Protective Equipment to Reduce Dermal Exposure to Agricultural Chemicals.

Dermal or skin exposure accounts for about 90% of the exposure a user receives.

Rates of absorption through the skin varies for different parts of the body. Compared to the absorption rate of the forearm, absorption through the forehead is 4.2 times faster, and the groin area has an absorption rate 11 times faster than the forearm. The stomach area of the body and the foot have an absorption rate twice that of the forearm.

Absorption continues to take place on all affected skin as long as the chemical is in contact with the skin. The seriousness of the exposure is increased if the contaminated area is large or if the chemical remains in contact with the skin for a long period of time.

PRINCIPLE OF OPERATION

The ***BatchBoy*** is designed and manufactured to be used to transfer agricultural chemicals into your sprayer tank while you are filling your sprayer tank with water.

The stream of water going to your sprayer tank flows through the unit and becomes the carrier to transfer the chemical and it's vapors.

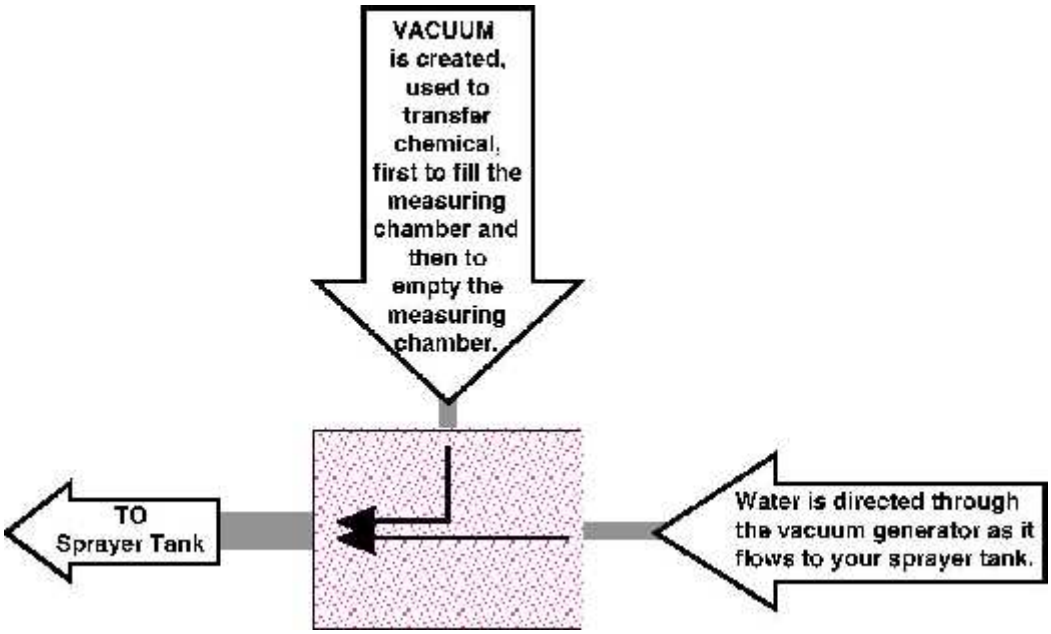
While transferring chemical the unit allows you to accurately measure the amount of chemical you are transferring.

The ***BatchBoy*** uses this vacuum to draw chemical into it's measuring chamber. Chemical is drawn into the measuring chamber where it is precisely measured.

Only true liquid volume is measured. Air and vapors do not affect the liquid level in the measuring chamber.

Once the proper volume of chemical is drawn into the measuring chamber, the unit uses this same vacuum source to empty the measuring chamber and mix this measured amount of chemical with the stream of water flowing through the unit to your sprayer tank.

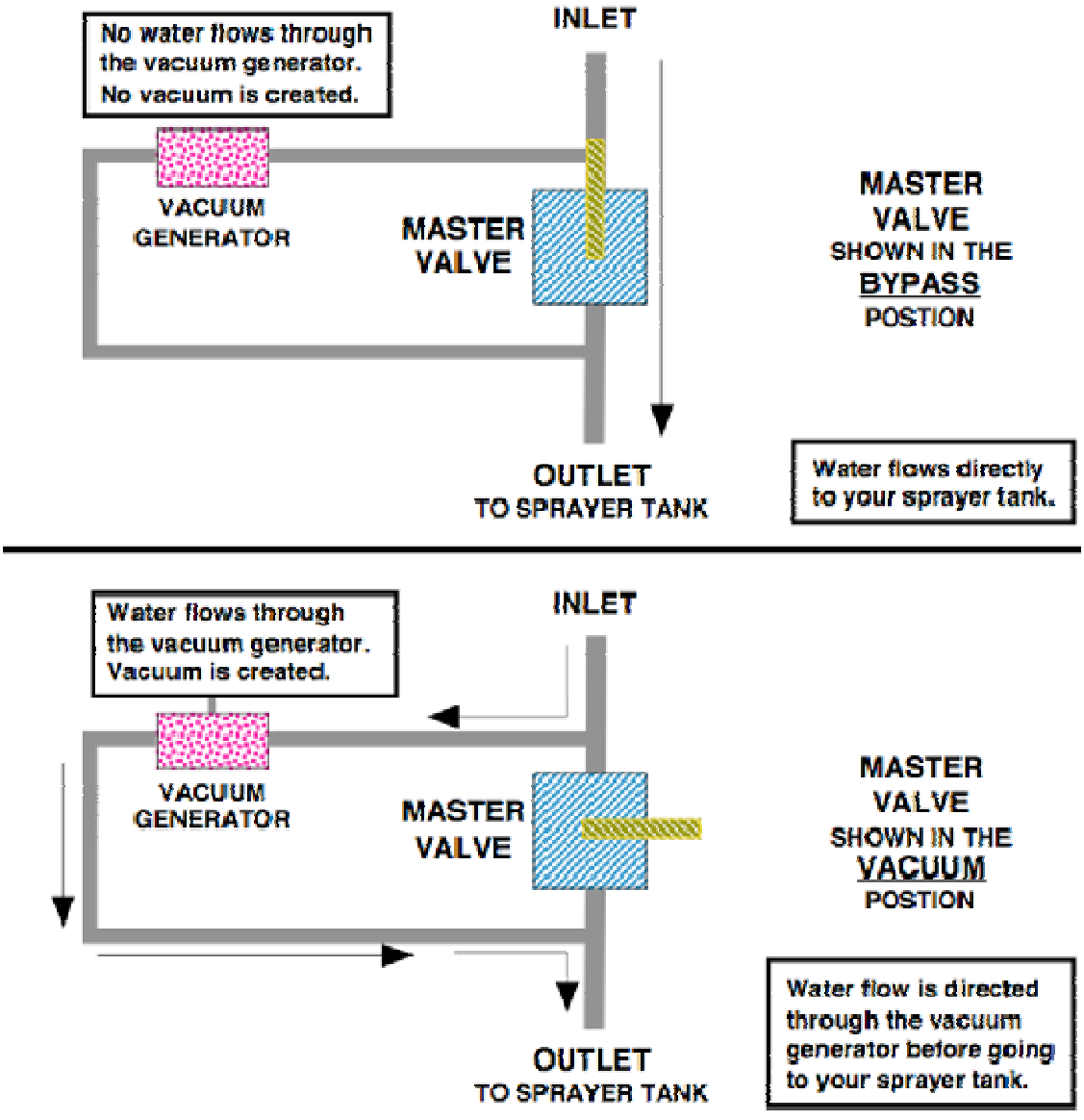
The ***BatchBoy*** needs water flowing through it to function. A minimum of 15 gpm at 25 psi is required to sufficiently operate the unit. This flow of water must enter through the 3" manifold fitting on the unit and exit out the front of the unit through the 3'' outlet port.



VACUUM GENERATOR

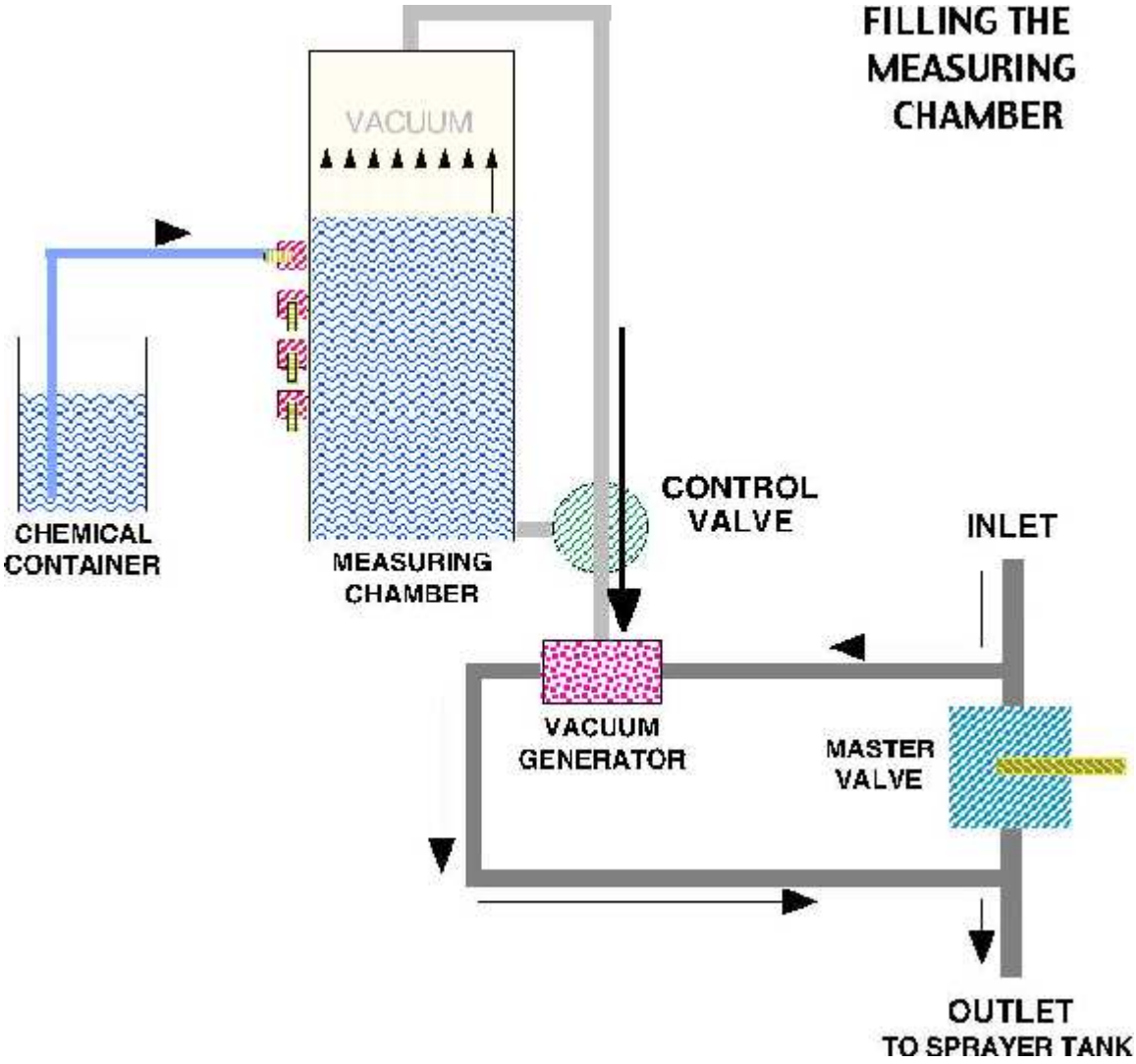
A **Master Valve** directs the stream of water as it flows through the ***BatchBoy***. This valve will either allow the water to pass straight through the unit, or direct the flow of water through a venturi style vacuum generator.

When water is directed through the venturi style vacuum generator it creates a vacuum that is used by the unit to draw chemical into the measuring chamber and also to draw chemical back out of the measuring chamber.



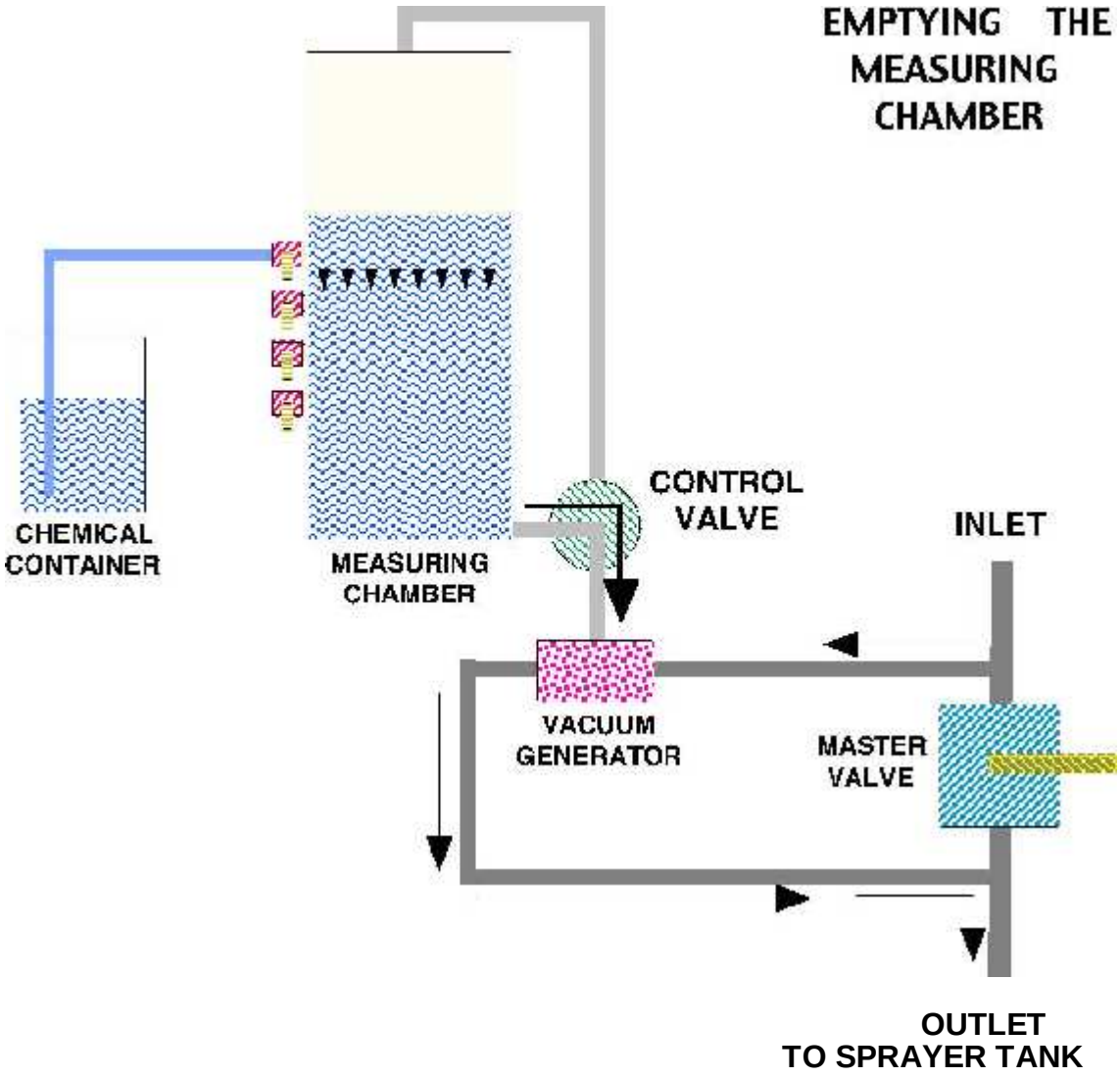
O p e r a t I o n

To draw chemical into the measuring chamber, vacuum is directed to the top of the measuring chamber through a tube, putting the whole measuring chamber under vacuum. When a **Chemical Valve** on the side of the measuring chamber is opened, this vacuum is directed to the piping leading to a chemical container thereby allowing this vacuum to draw chemical out of it's container, through the piping, and into the measuring chamber.



To empty the measuring chamber of chemical, vacuum is directed to the bottom of the measuring chamber, directly drawing the chemical out and mixing it with the stream of water flowing through the unit.

A **Control Valve** is incorporated into the design of the ***BatchBoy*** that controls where the vacuum is directed, either to the top of the measuring chamber for filling, or to the bottom of the measuring chamber for emptying. This **Control Valve** also vents the measuring chamber to atmosphere when emptying it, relieving the vacuum inside the measuring chamber so chemical can be drawn out the bottom of the measuring chamber.



O p e r a t I o n

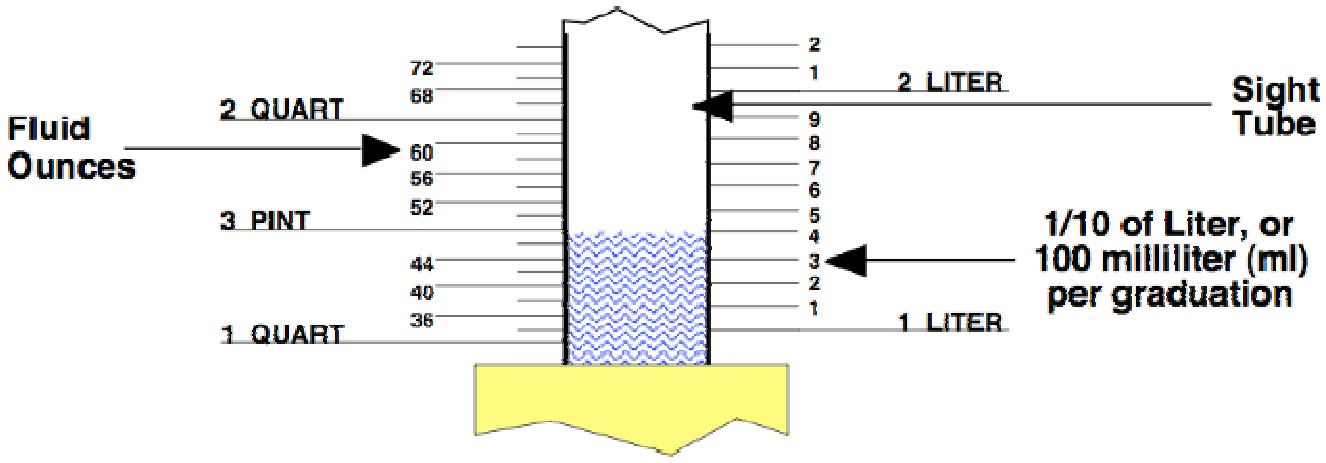
The measuring chamber is fitted with a transparent liquid level sight tube, providing a visual indication of the liquid level inside the measuring chamber.

The background behind the sight tube is a graduated scale, visible by looking through the sight tube or just past the sight tube.

To the left side of the sight tube is the Standard English (US) scale, divided by Gallons, Quarts, Pints, and fluid ounces (fl. oz.) Each line on the scale represents two fl. oz. of volume.

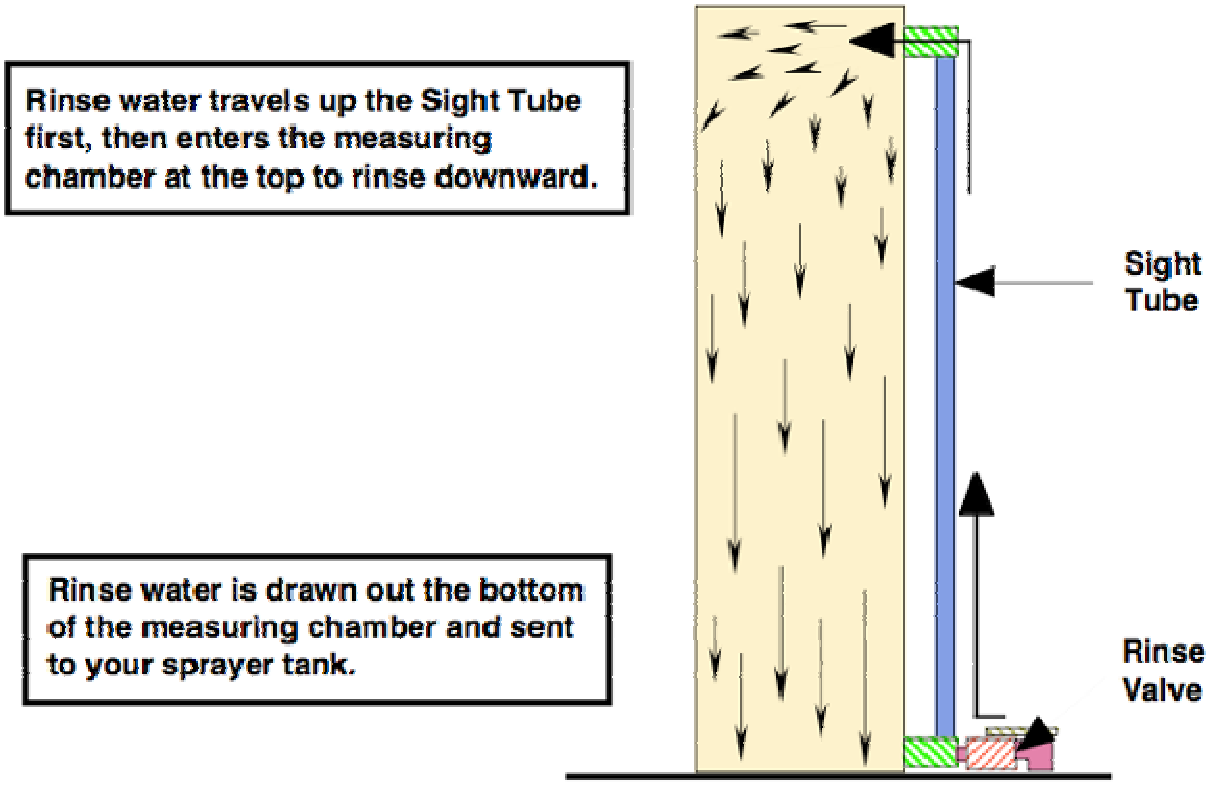
To the right side of the sight tube is the Metric scale, divided by Liters, and subdivided by 1/10th liters. Each 1/10th of a Liter is equal to 100 milliliters (ml).

While filling the measuring chamber with chemical the operator watches the liquid level rise inside the measuring chamber. When the liquid reaches the desired level, the operator stops filling the measuring chamber with chemical.



A rinse feature is incorporated into the design, allowing you to rinse the sight tube, measuring chamber, and the rest of the ***BatchBoy*** after each batch of chemical is transferred. Water for rinsing is obtained from the water supply entering the unit through the water inlet port, pressurized by your transfer pump.

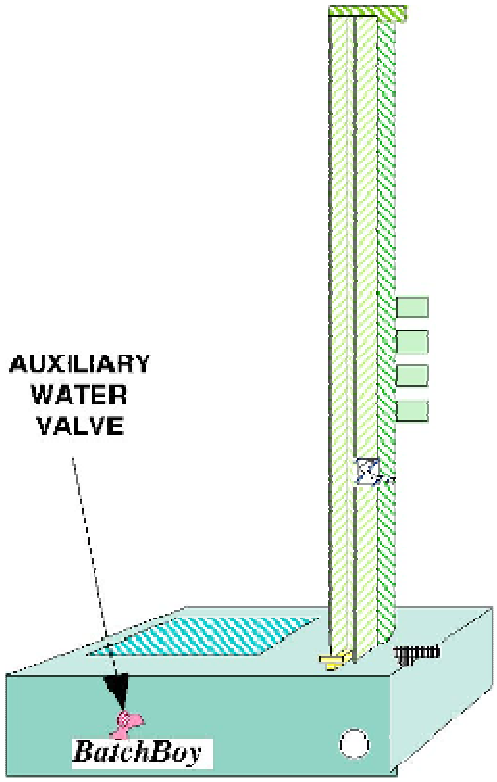
Opening the **Rinse Valve** directs rinse water to flow up the sight tube first, enter the measuring chamber at the top and wash down the inside of the measuring chamber, continuing through the rest of the unit to rinse completly. The rinse water eventually ends up in your sprayer tank.



O p e r a t I o n

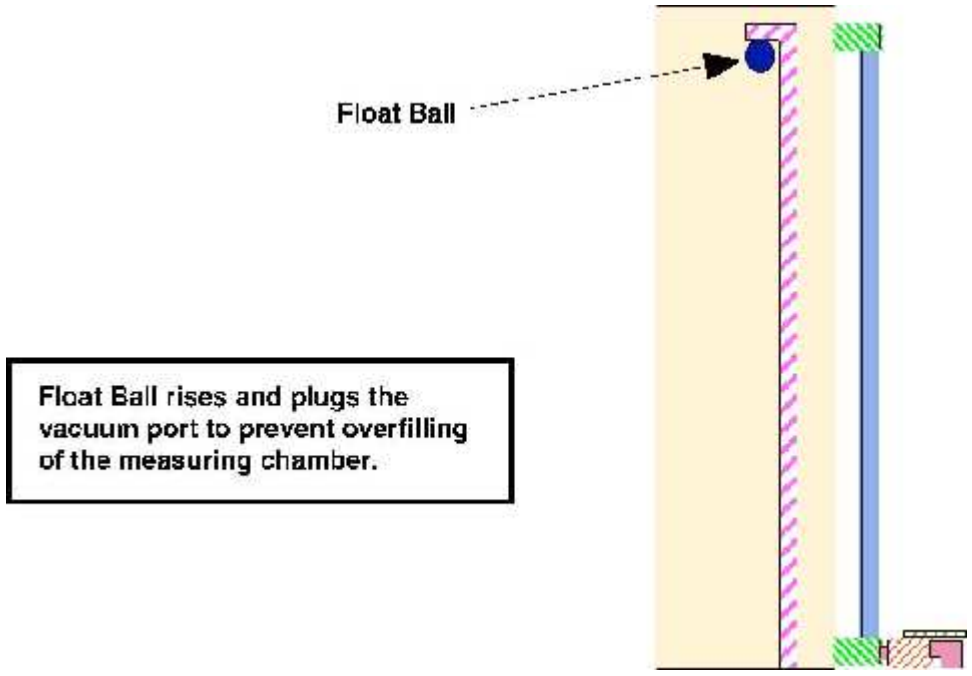
An auxiliary **Water Valve** is provided on the front of the unit. The water to this valve is supplied by the inlet water, pressurized by your transfer pump.
This valve can be used to supply water to rinse your chemical containers, to add water to a cone tank to dissolve powdered chemicals, or any other need for water.

Do not use this water supply to wash, rinse, or clean yourself or another person, or for any other human type purposes, such as drinking. The water from this supply may not be safe and may be contaminated with chemicals.



In the event the operator is distracted while filling the ***BatchBoy*** with chemical, the measuring chamber could inadvertently becomes overfilled. An overfill prevention feature has been designed into the machine. Inside the measuring chamber, near the top, is a float ball. The rising liquid level inside the measuring chamber will eventually reach this float ball causing it to float up to the vacuum port inside the measuring chamber. When the float ball reaches the vacuum port, it will be drawn into the vacuum port thereby blocking the vacuum being directed to the top of the measuring chamber. This will halt the drawing of additional chemical into the measuring chamber.

When the Control Valve is moved to the EMPTY position, the measuring chamber will began to empty and the float ball will fall back out of the vacuum port.

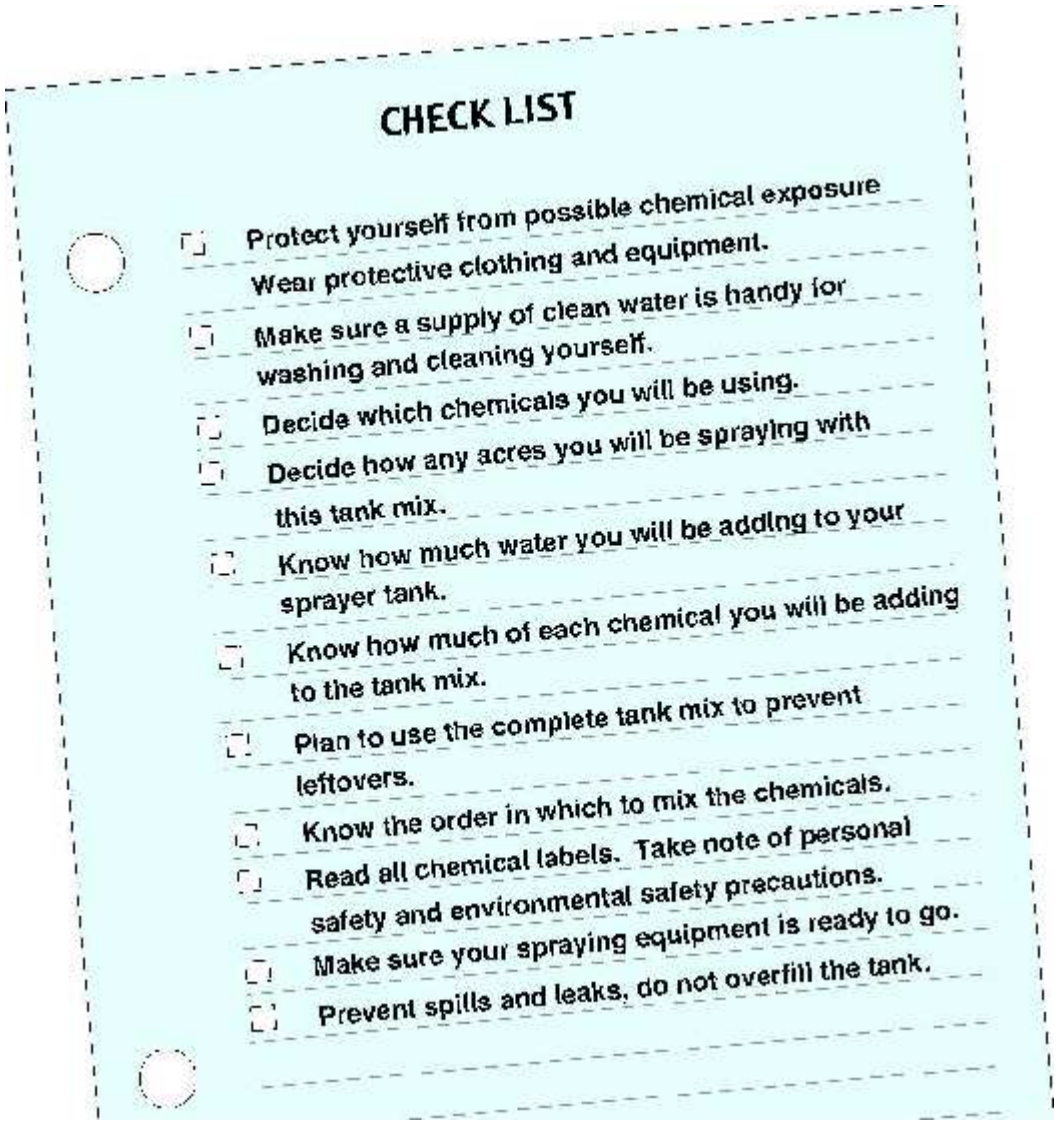


PLAN BEFORE OPERATING

Probably the most important item to have ready before using the *BatchBoy* is yourself. You need a plan. You need to know what you want to do and what you want your equipment to do. You need to know what chemicals and how much of each chemical you intend to use.

The *BatchBoy* can not think, you need to do that.

Below is a sample CHECK LIST you may consider using. It shows some items that need to be addressed, before you start filling your sprayer with water and chemical.

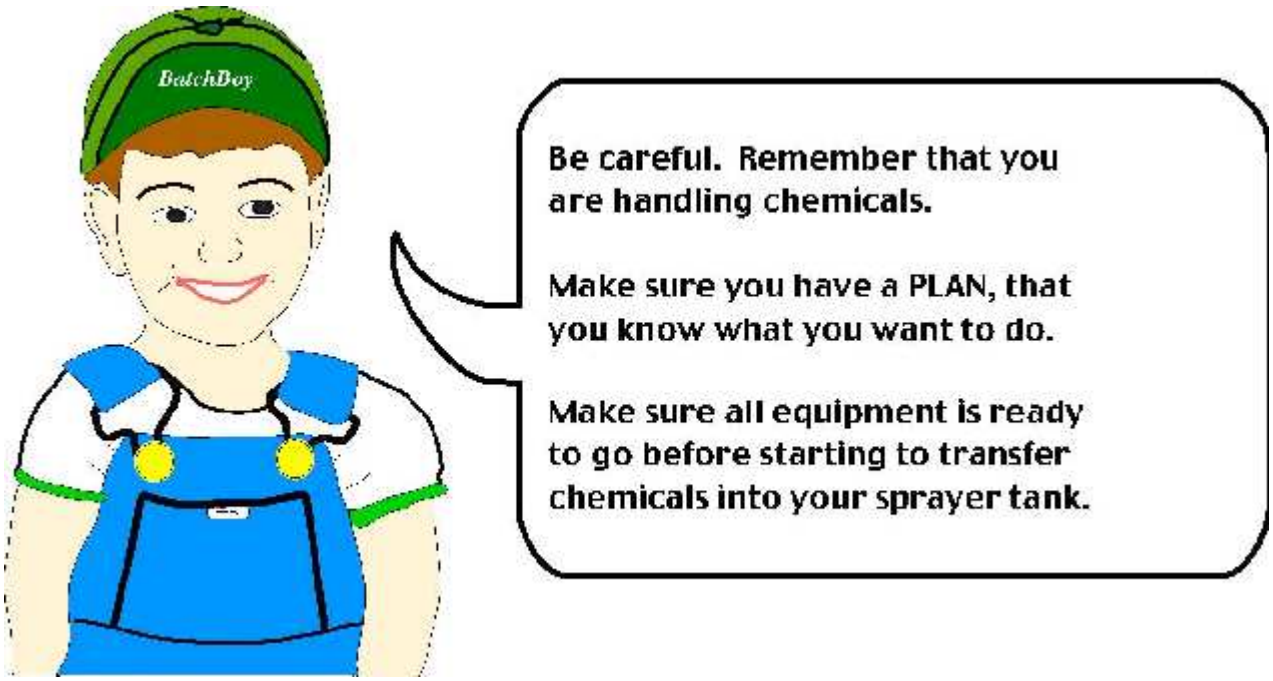


OPERATING PREPARATIONS

Before operating this unit, be sure you have read the safety section of this manual, and protect yourself from the hazards of agricultural chemicals by wearing all required safety clothing and equipment, including shoes, gloves, body suit, face shield, respirator, and goggles.

Warning -*Handling chemicals is dangerous. Exposure to chemicals or their vapors can be hazardous to your health and safety. Please refer to the safety section of this manual for further instructions.*

To familiarize yourself with using the ***BatchBoy*** you should PRACTICE WITH W ATER.



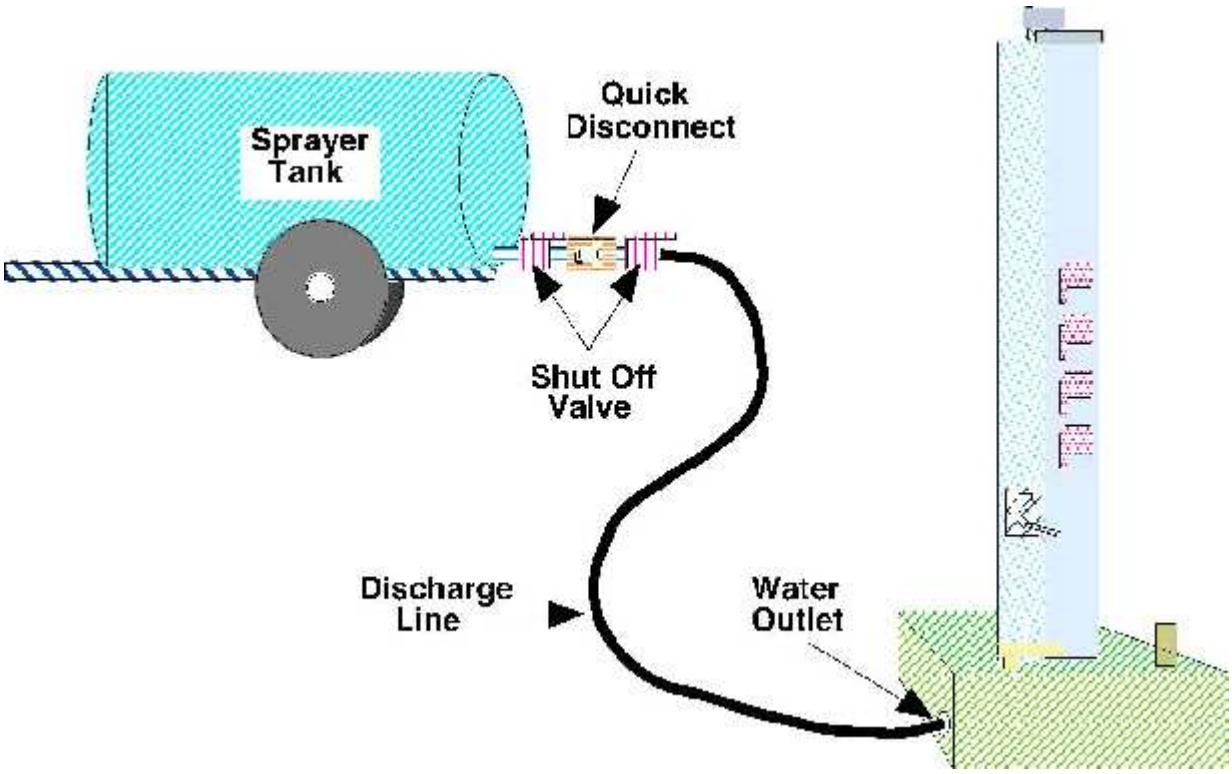
Operation

A discharge line from the ***BatchBoy*** must lead to your sprayer tank and be secured to the tank. Bottom filling of your sprayer tank is recommended, having a shut off valve on the discharge hose, a shut off valve on the tank filling line, and a quick disconnect between the two shut off valves.

If you are bottom filling your sprayer tank be sure the tank is vented before starting to fill the tank with water. You may need to remove the fill cover to provide sufficient venting. If vented, the vent must be large enough to allow the escape of water at a rate equal to the rate you fill the tank.

A water supply to the ***BatchBoy*** needs to be in place and ready to create a flow of water through the unit and on to fill your sprayer tank.

Before operating the ***BatchBoy*** all plumbing lines and connections discussed in the installation section of this manual must be complete and leak free. The ***BatchBoy*** must be securely anchored and all chemical containers must be secured.



Chemical draw lines need to be in place leading from the **Chemical Valves** on the ***BatchBoy*** to each chemical container.

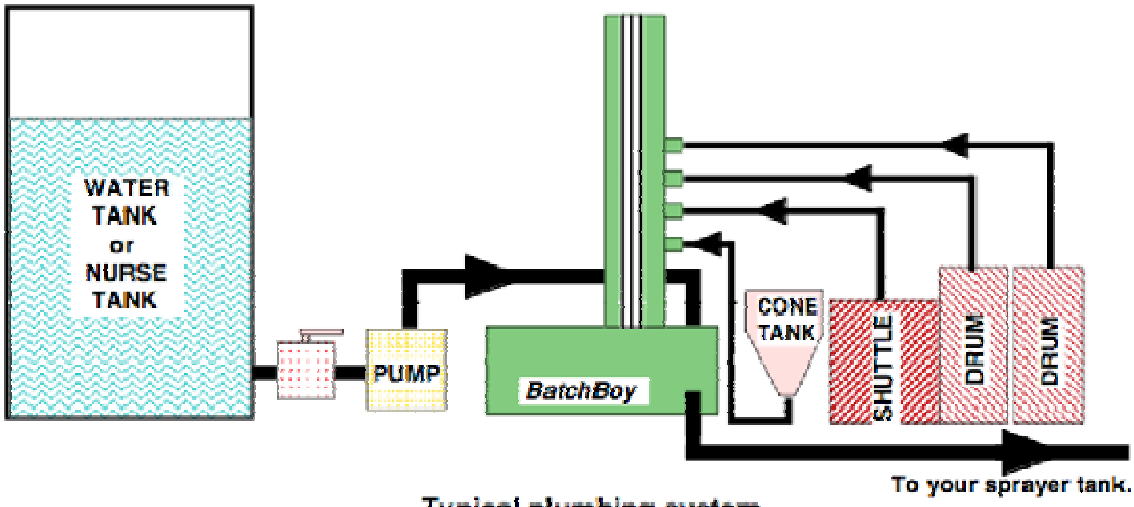
Before drawing chemical out of it's container, you must vent the container. The ***BatchBoy*** uses vacuum to draw chemical out of it's container. If the container is not vented it may collapse, creating a very dangerous situation.

Valves on the ***BatchBoy*** should be positioned as follows:

Master Valve	***BYPASS***
Control Valve	***EMPTY***
Chemical Valves	***OFF***
Rinse Valve	***OFF***
Water Valve	***OFF***

Open all valves that will allow water to flow from the water supply, all the way through to the sprayer tank. This includes the valves on the discharge line going to your sprayer tank and the shut off valve on your nurse tank supplying water to your transfer pump.

At this point you should know what you want to do, and have all equipment ready to do what you want it to do.

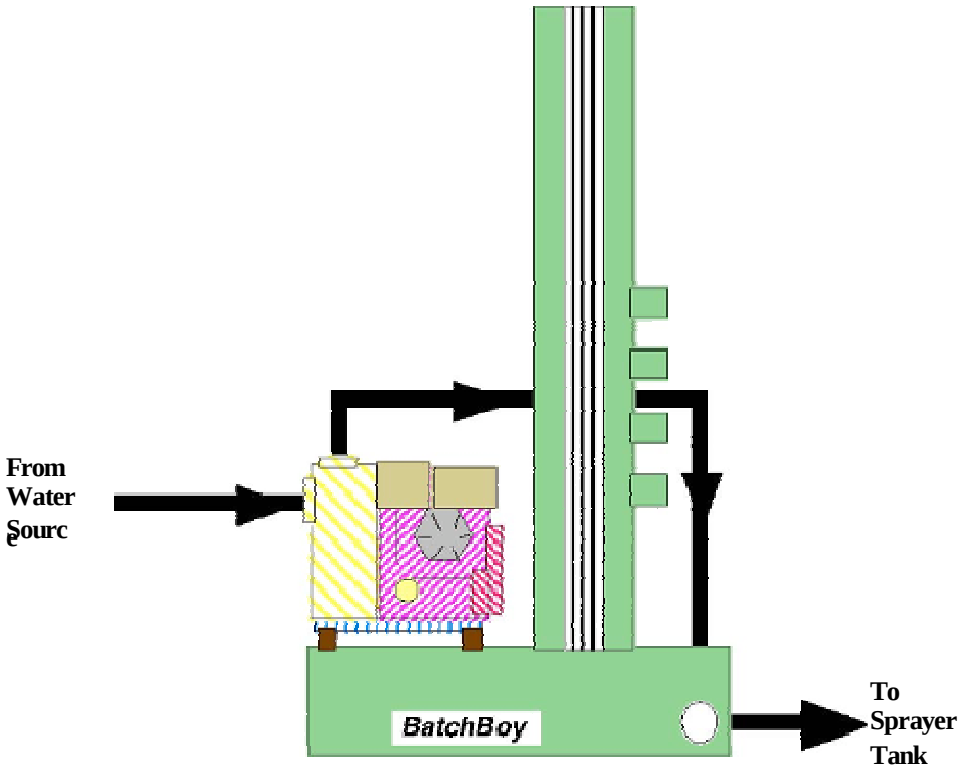


Typical plumbing system

SEQUENCE OF OPERATION

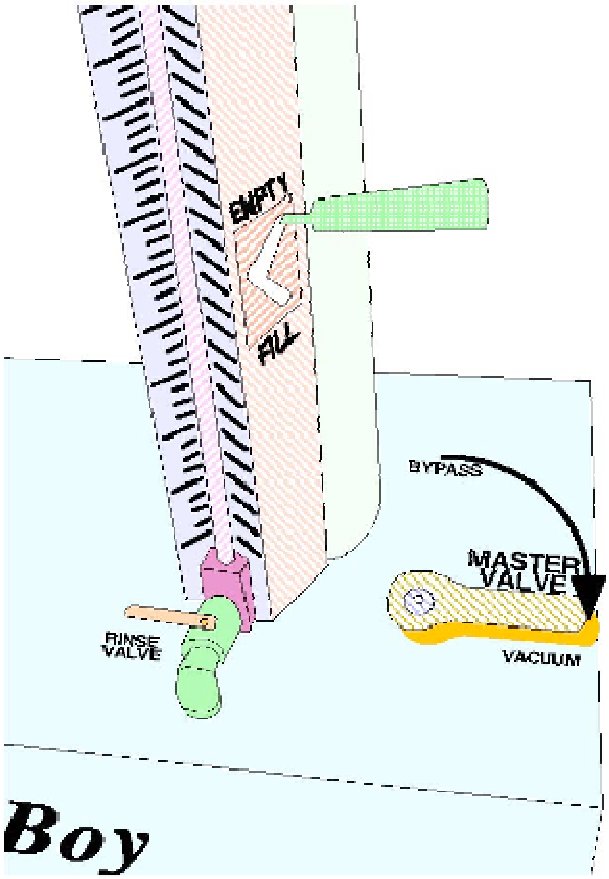
START

Start the transfer pump. All valves between your water source and your sprayer tank should be open. Water should now be flowing through the ***BatchBoy*** and onward to your sprayer tank.



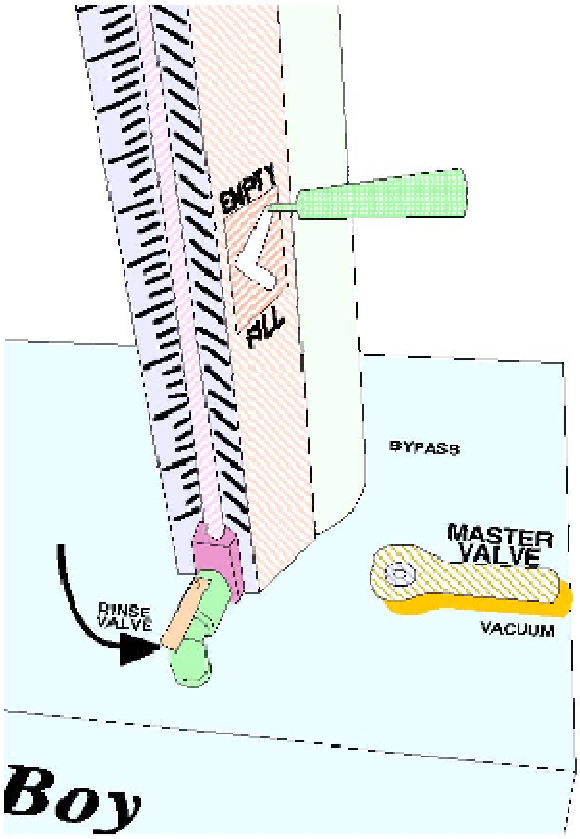
MASTER VALVE

Move the **Master Valve** to the ***VACUUM*** position. Now the stream of water is blocked from going straight through the unit and is being diverted through the venturi style vacuum generator before going to your sprayer tank. The ***BatchBoy*** is now creating a vacuum.



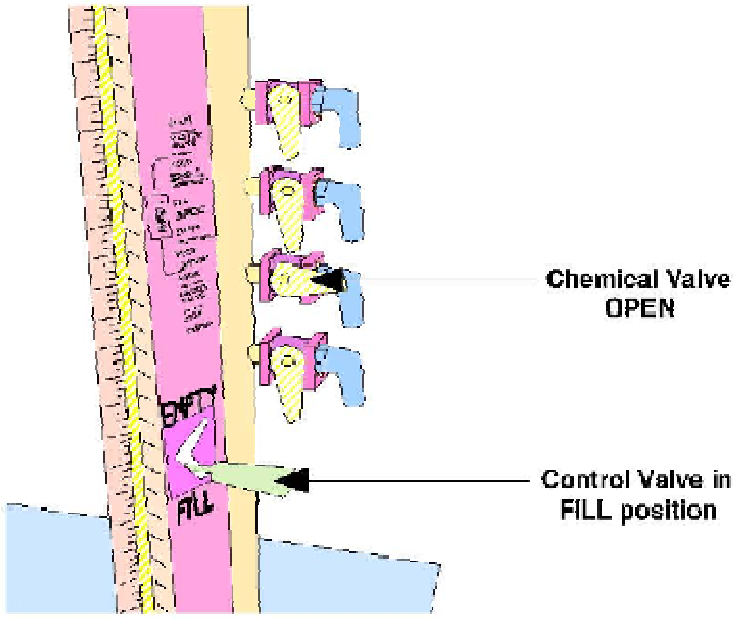
RINSE

Rinse the measuring chamber. Open the **Rinse Valve** for 5 - 7 seconds. This will direct water up the sight tube and into the measuring chamber, rinsing the complete machine.



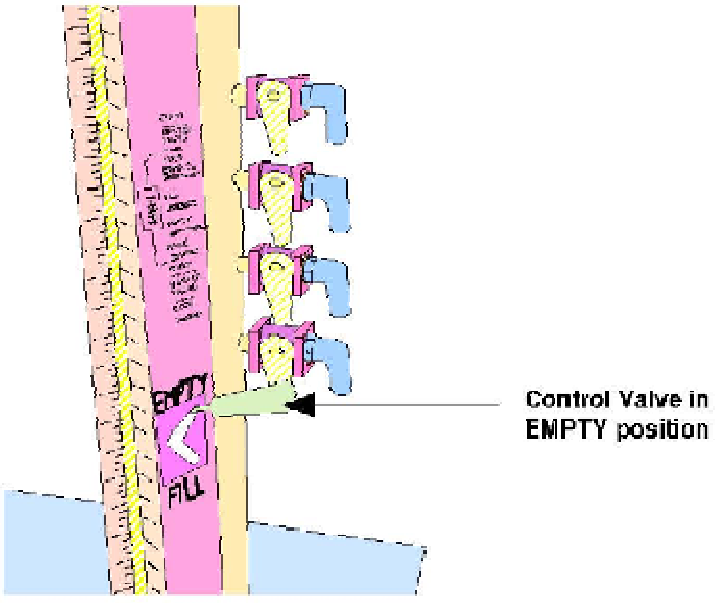
FILL

Fill the measuring chamber with the desired amount of chemical. Open a **Chemical Valve**, allowing the unit to draw chemical into the measuring chamber. As the liquid approaches the desired level, start to partially close the **Chemical Valve**, slowing down the filling rate. Completely close the **Chemical Valve** when the liquid reaches the desired level.



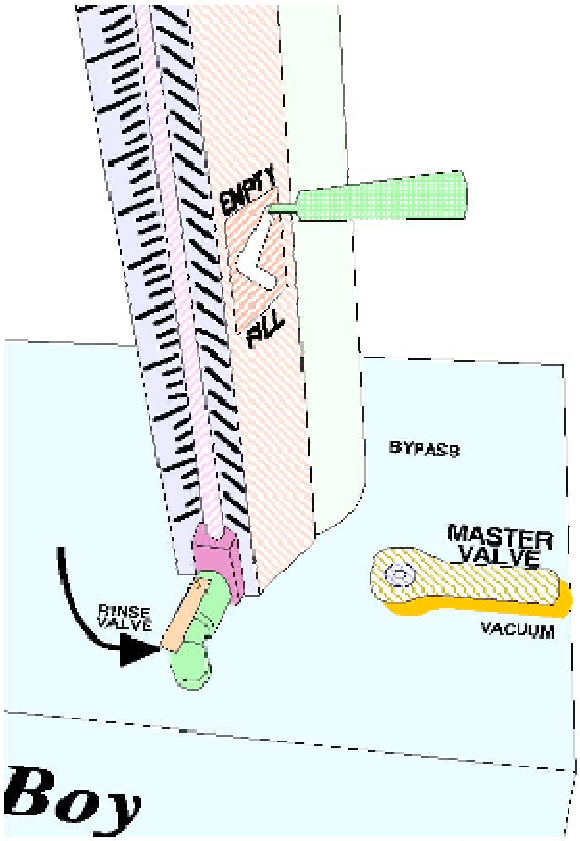
EMPTY

Empty the measuring chamber. Move the **Control Valve** to the ***EMPTY*** position. Chemical will be drawn out of the measuring chamber and mix with the stream of water going to your sprayer tank. Be sure to completely empty the measuring chamber. There is a small quantity of liquid in the measuring chamber that is below the sight tube.



RINSE

Rinse the unit. After the measuring chamber is empty, open the **Rinse Valve** and rinse the unit for 5 - 7 seconds.



REPEAT

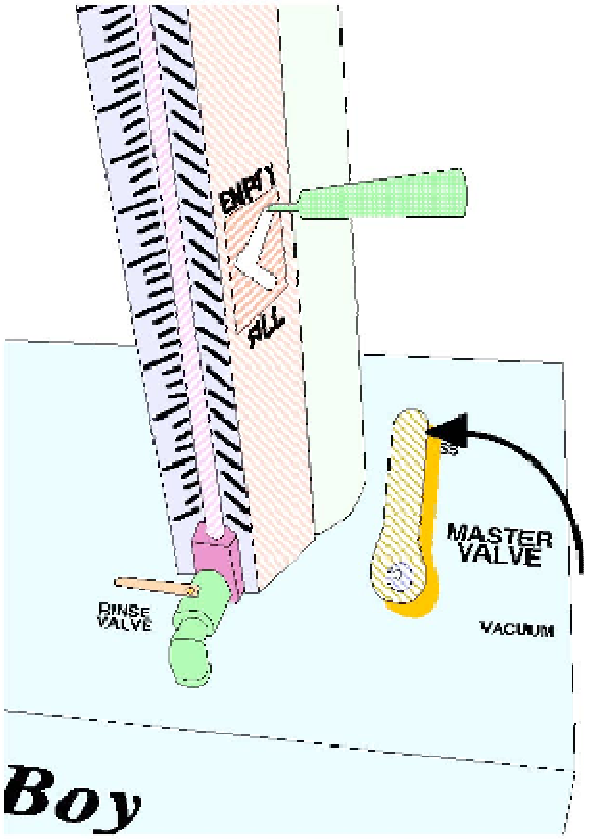
The unit is now ready for the next batch of chemical. Repeat filling the measuring chamber with chemical, Emptying the measuring chamber, and Rinsing the unit for each batch of chemical.

FINAL RINSE

When finished adding the last batch of chemical to your sprayer tank, Rinse the unit for about 10 seconds. If the chemical you are using is sticky or gummy, or can discolor the sight tube, you may want to do this final rinse for more than 10 seconds.

MASTER VALVE

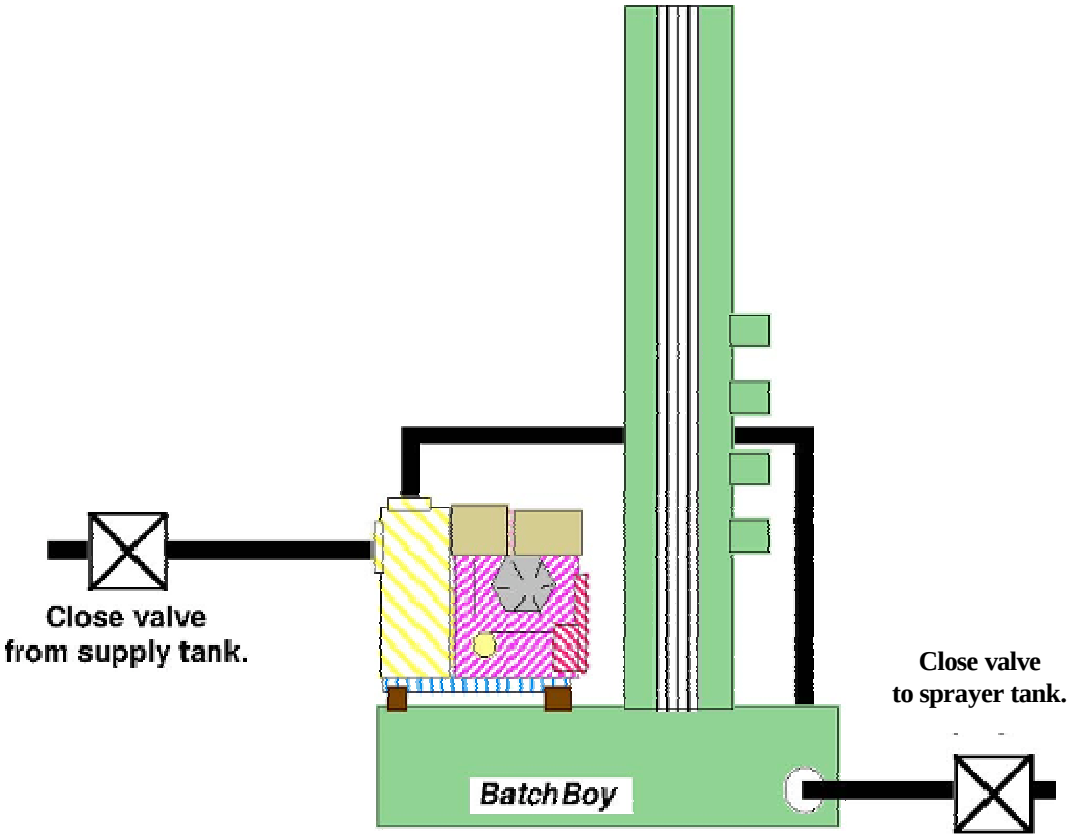
Move the **Master Valve** back to the ***BYPASS*** position. Now the stream of water is directed straight through the unit to your sprayer tank allowing you to finish filling the sprayer tank.



STOP

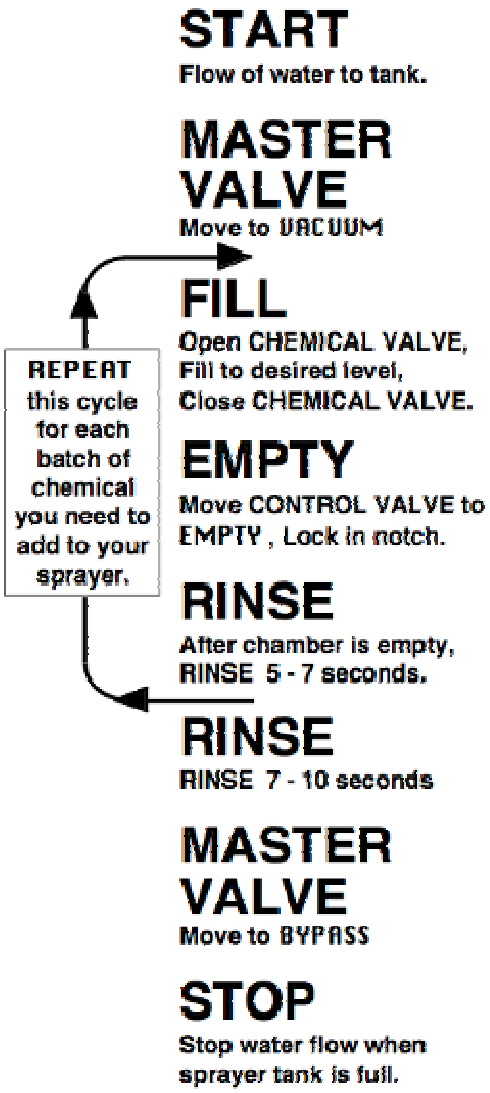
Stop your transfer pump and close all valves, including the shut off valve between the nurse tank and your transfer pump and the valves in the discharge line leading to your sprayer tank.

The ***BatchBoy*** along with the rest of your system should now be ready for the next tank filling.



This is an abbreviated version of the sequence of operation.

A copy of this sequence of operation is attached to the ***BatchBoy***, located just above the **Control Valve**.



MAINTENANCE

Before doing any maintenance on the ***BatchBoy*** be sure you have read the safety section of this manual. Protect yourself from the hazards of agricultural chemicals by wearing all required safety clothing and equipment, including shoes, gloves, body suit, face shield, respirator, and goggles.

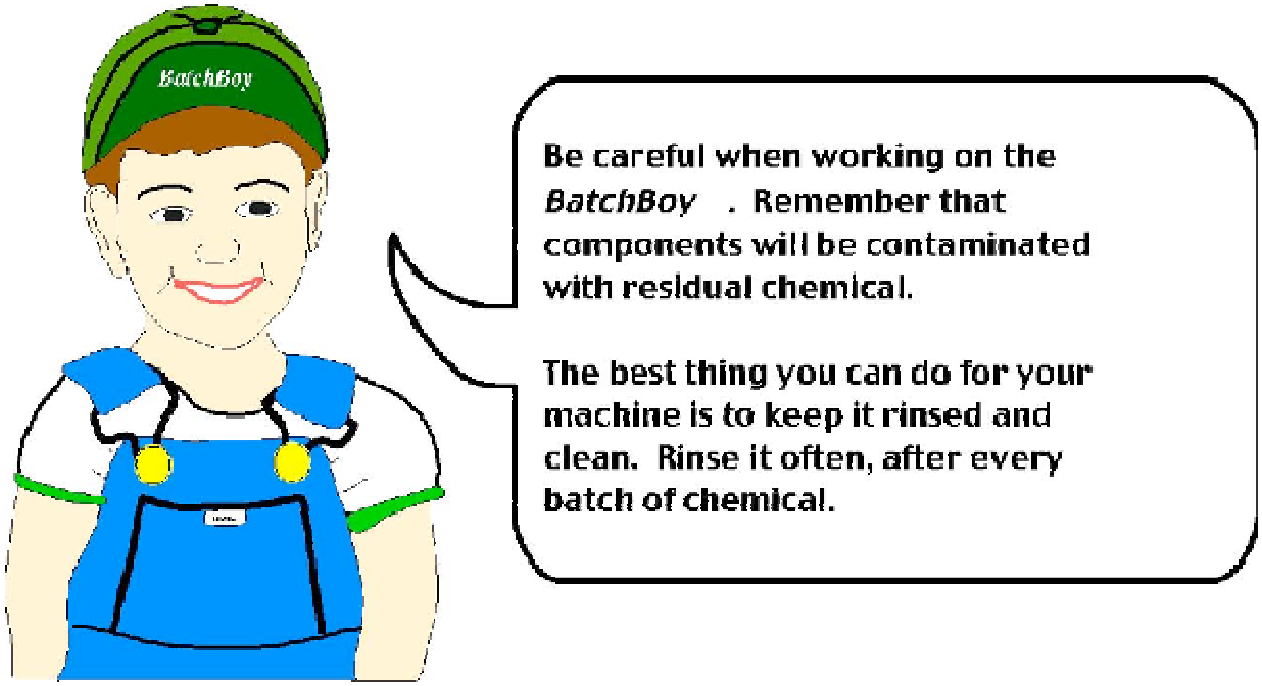
Warning *-Handling chemicals is dangerous. Exposure to chemicals or their vapors can be hazardous to your health and safety. Please refer to the safety section of this manual for further instructions.*

Very little maintenance is required to keep your ***BatchBoy*** looking and operating like a new unit.

The most important thing you should do is rinse the unit after every batch of chemical, using the Rinse Valve. This will keep the inside of the measuring chamber and all working components of the unit clean and free of chemical residue that can accumulate and gum up to cause moving parts to stick.

Keep the unit clean. Rinse the unit with clean water to keep dust and dirt from accumulating as well as washing off any chemical that may have collected on the outside of the unit.

Keep all plumbing connections and hoses leak free.



WINTERIZING

Keep the unit from freezing. If water insice the unit freezes, it coulc damage or ruin several components.

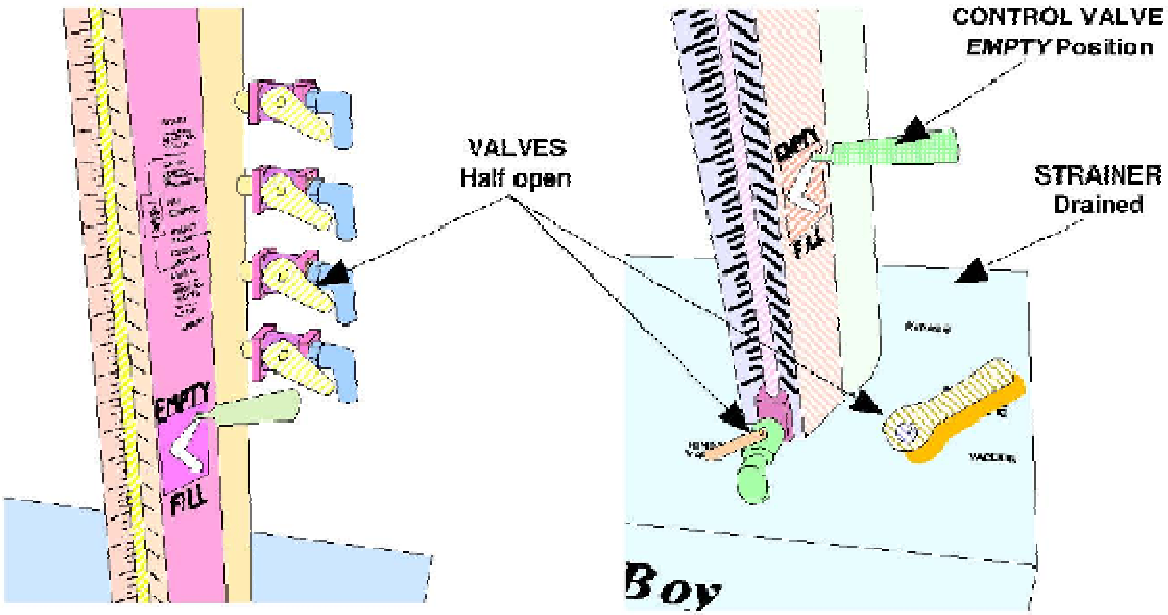
To winterize the unit, crain all water from the plumbing. The lowest point of the plumbing system is the OUTLET port on the front of the unit. Removing the cischarge hose from this outlet port will allow all the water inside the unit to drain out this port.

Make sure the **Control Valve** is in the ***EMPTY*** position, and all other valves should be positioned half way between open and closed. This includes the **Master Valve, Rinse Valve, Water Valve**, and **Chemical Valves**.

Positioning these valve at the midway point allows water to drain through the valve, as well as draining the water that can bc caught bchinc thc ball of thc valve.

Remove the cap on the 1" strainer and drain the water from the strainer. This strainer may be accessed through the inspection hole in the back of the base.

At this point the unit is ready for freezing temperatures, winter storage, or extended periods of storage.

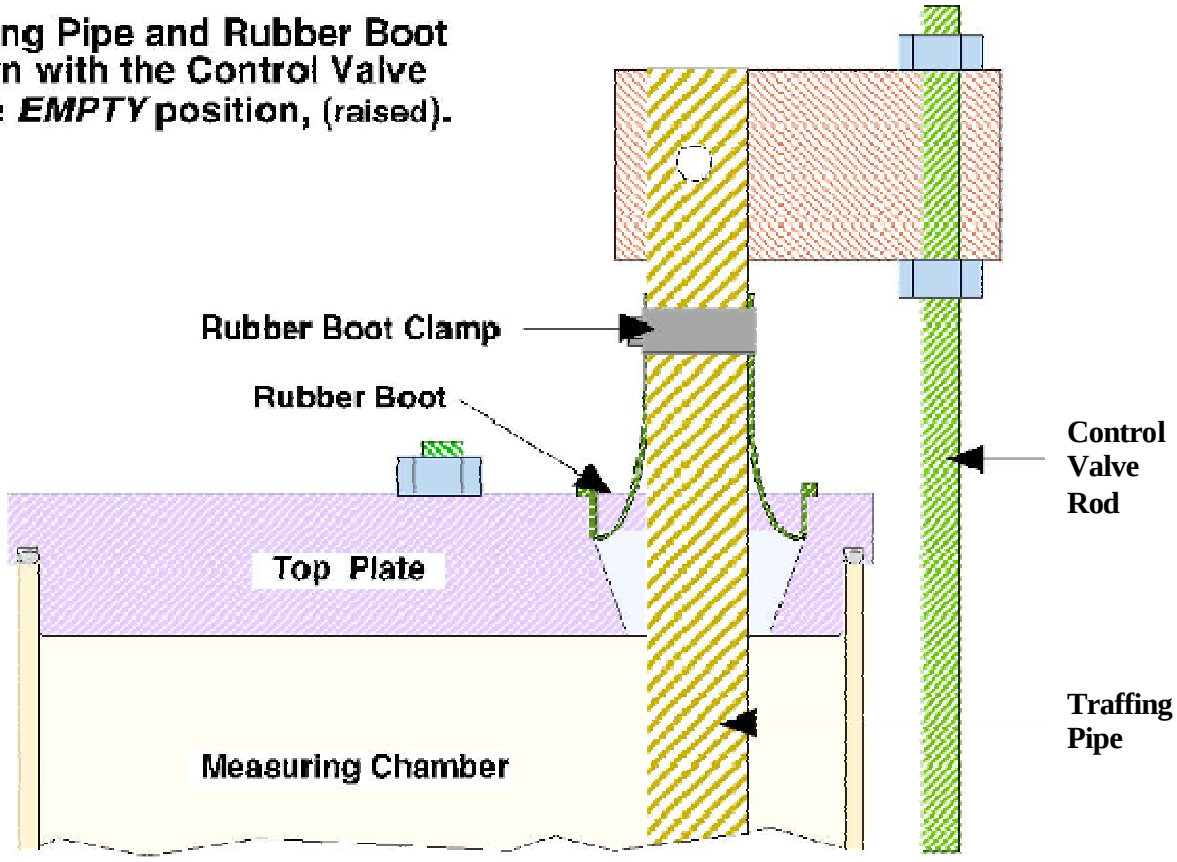


RUBBER BOOT REPLACEMENT

The rubber boot located in the top plate of the measuring chamber creates a flexible seal between the top plate and the traffing pipe. This flexible sealing member allows the traffing pipe to move vertically while maintaining a barrier between the measuring chamber and the atmosphere.

Eventually this rubber boot may rupture from wear or damage, requiring replacement.

Traffing Pipe and Rubber Boot shown with the Control Valve in the *EMPTY* position, (raised).



To remove the Rubber Boot;

1) Make sure the **Control Valve** is in the ***FILL*** position, (lowered).

2) Remove the top 3/8" nut on the control valve rod. The lower nut should stay just where it is.

3) Remove the pin in the control valve block.

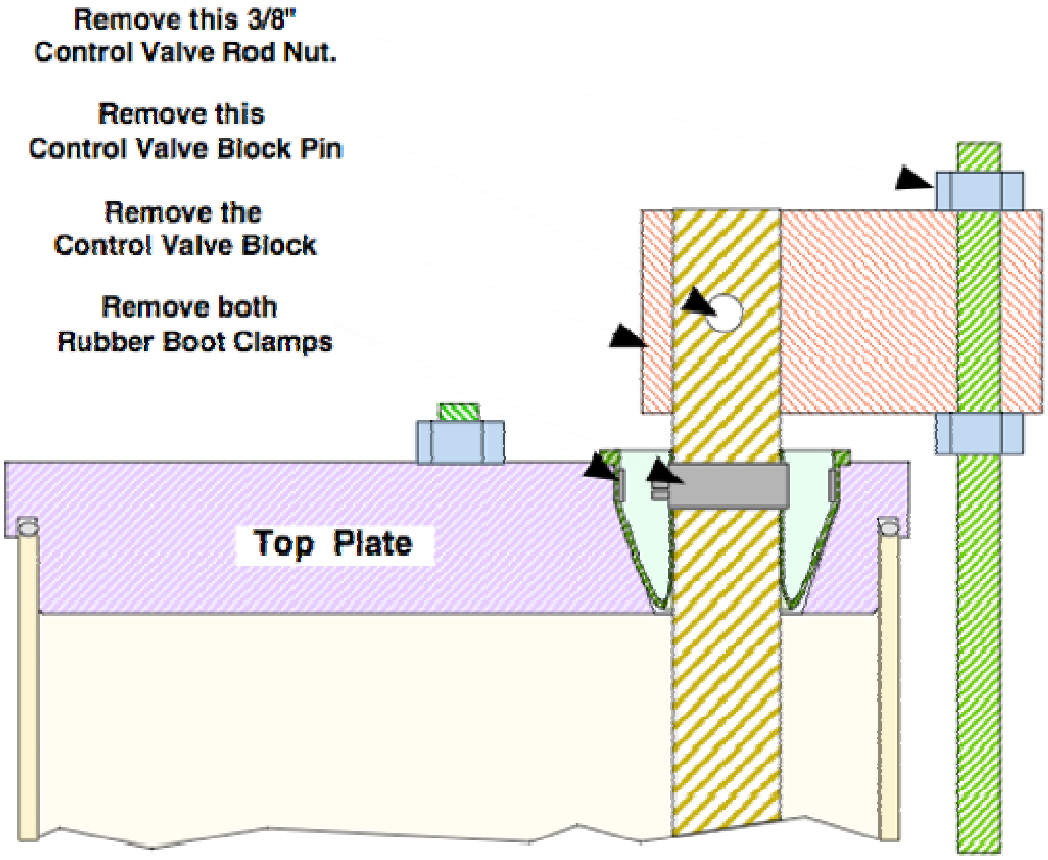
4) Mark the traffing pipe with respect to the control valve block and the top plate. The traffing pipe needs to be rotated to this same orientation when reassembled.

5) Pull the control valve block off the traffing pipe.

6) Remove both rubber boot clamps. You can raise the traffing pipe by hand enough to gain better access to the smaller, inner clamp.

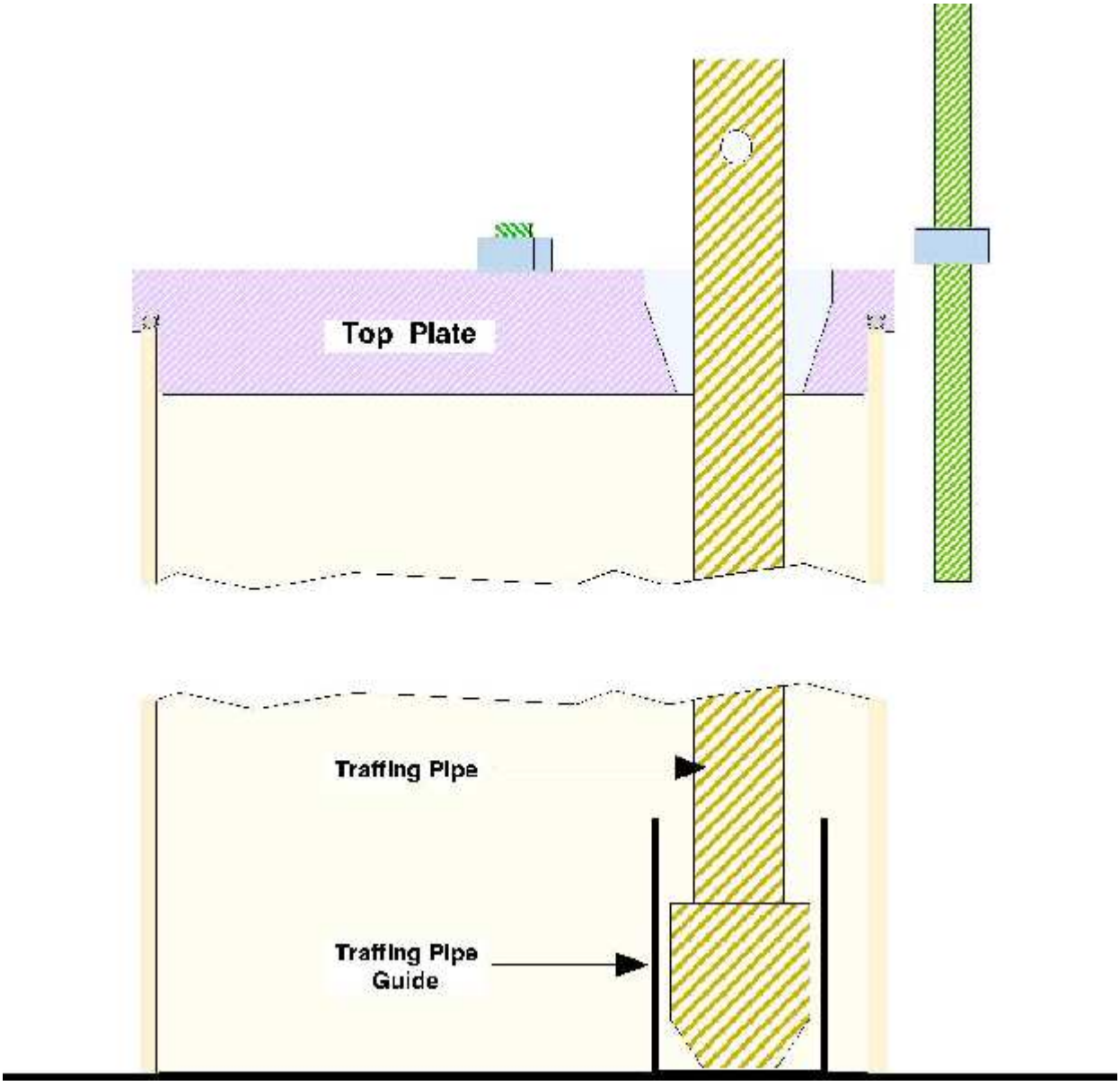
7) Remove the rubber boot by sliding it up and off the traffing pipe. The rubber boot should pull out of it's cavity in the top plate.

CAUTION During steps 5 - 7, be careful to not pull up too hard on the traffing pipe. You may damage components inside the measuring chamber. Hold the traffing pipe with your hand and pull against your hand.



While removing the rubber boot it is very likely the traffing pipe was inadvertently raised more than 2.5", and therefore pulled out of it's lower guide in the bottom of the measuring chamber. Before installing the new rubber boot you must make sure the traffing pipe is back in it's guide.

You will have to 'feel' the traffing pipe back into it's guide. The traffing pipe fits loosely in it's guide and is very easily reinserted into the guide.



To install a new rubber boot;

1) Thoroughly clean the traffing pipe and the rubber boot cavity in the top plate.

2) Make sure the lower end of the traffing pipe is in it's guide.

3) Rotate the traffing pipe to it's proper orientation.

4) Slip the rubber boot over the traffing pipe and slide it down the pipe into place. You will need to work the rubber boot into it's cavity in the top plate. Make sure the rubber boot is fully seated into the top plate.

5) Install the larger, outer rubber boot clamp to secure the rubber boot in the top plate.

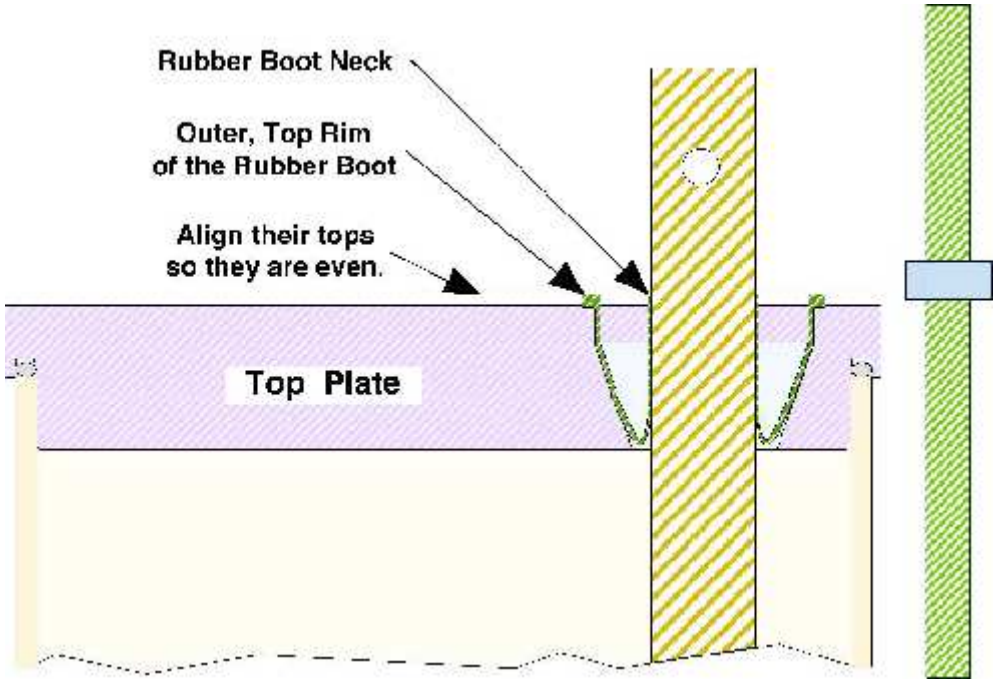
6) While holding the traffing pipe down in it's lower position and in the proper rotation orientation, align the top of the neck of the rubber boot with the top of the outer rim of the rubber boot. The inner portion of the rubber boot, the neck, and the outer portion of the rubber boot, the top rim, should be even with each other.

7) Install the smaller, inner rubber boot clamp. At this point you may carefully raise the traffing pipe just enough to allow easy installation of the clamp.

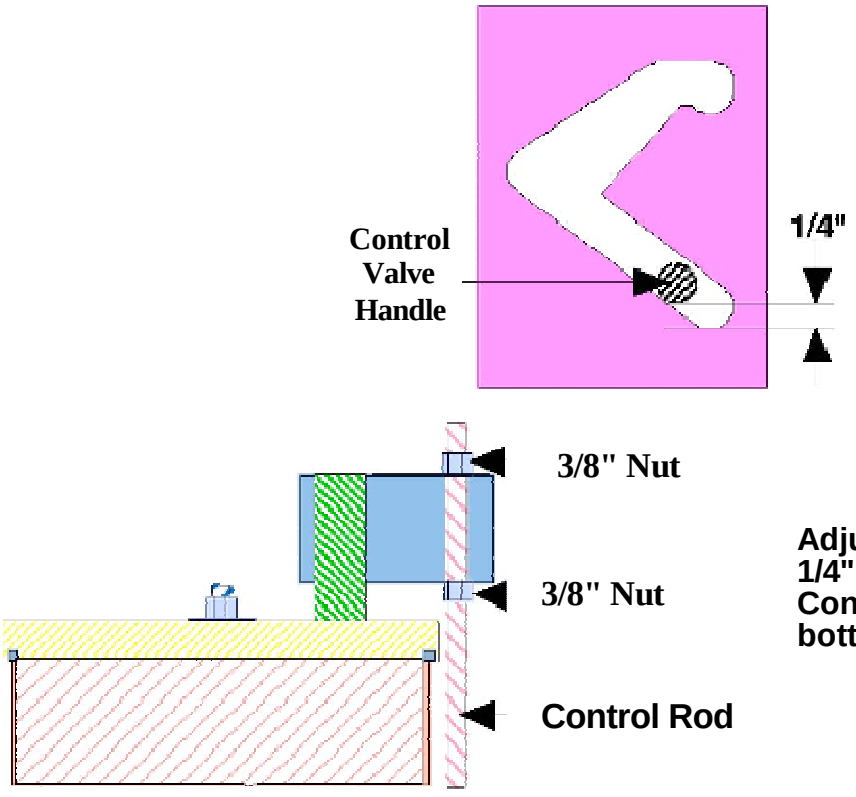
8) Install the control valve block.

9) Install the control valve block pin.

10) Install the 3/8" nut on the control valve rod.



ADJUSTMENT Periodically check the **Control Valve** handle for proper adjustment. When the **Control Valve** is in the ***FILL*** position there should be about 1/4" of clearance between the handle and the bottom of the slot. If there is no clearance, the handle may be limiting the travel of the **Control Valve**, not allowing the **Control Valve** to completely seat itself during the filling operation.	Adjusting the **Control Valve** handle is performed by adjusting the 3/8" nuts found at the top end of the control rod, just under and on top of the plastic block. Adjust these nuts, either upward or downward, so that the **Control Valve** handle has about 1/4" clearance from the bottom of it's slot when the valve is in the ***FILL*** position. Do not over tighten the nuts against each other, the control rod needs to rotate inside the plastic block.



Adjust these nuts to establish a 1/4" clearance between the Control Valve Handle and the bottom of it's slot.

STRAINERS

An inline 1 inch strainer with a 8 mesh Stainless Steel basket is provided with the ***BatchBoy*** to strain all water going to the vacuum generator.

When the **Master Valve** is in the ***VACUUM*** position, water is being diverted through the nozzle of the vacuum generator. Straining the water removes debris from the water that could clog or plug the nozzle of the vacuum generator.

This strainer will need to be cleaned periodically. The strainer may be accessed through the inspection hole in the back of the unit. Remove the stainless steel basket from the strainer by threading the lower end cap off the body of the strainer. The basket will slide out of the body. Clean the basket with water and replace.

Before replacing the end cap, inspect the O ring found on the end cap for wear or cuts. A p ply a light coat of lubricant to the O ring before threading the end cap back onto the body of the strainer.

SIGHT TUBE

The sight tube comes in direct contact with chemical during each batch, subjecting it to staining or other damage from chemical attack. Thoroughly rinsing the machine immediately after each batch, using the Rinse Valve, will minimize the affect of chemical attack on the sight tube.

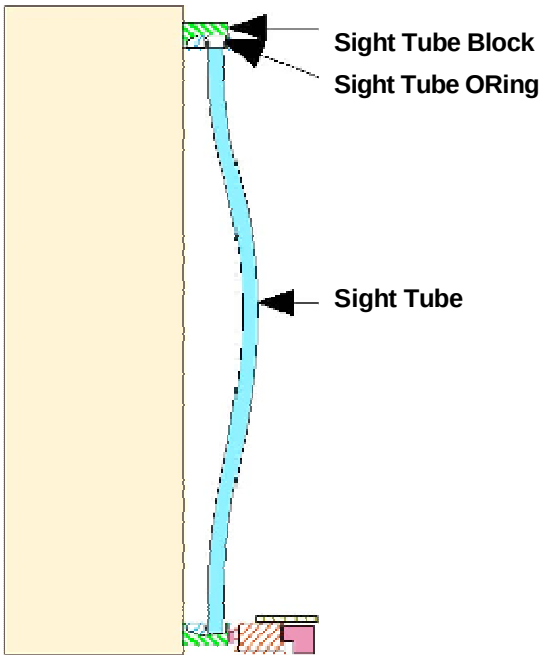
Replacement of the sight tube may eventually be required because of staining or damage from chemical attack.

Replacing the sight tube is a very simple task requiring no tools.

To remove the sight tube, grip the sight tube near it's center and pull it toward you, causing the sight tube to bow. While pulling, a twisting back and forth motion may be beneficial. As the sight tube continues to bow, either it's top end or it's bottom end will be pulled out of it's sight tube block. Once one end of the sight tube is out of it's block, pull the other end out.

The sight tube is sealed to it's block with an Oring. When replacing a sight tube, it is a good idea to also replace these Orings.

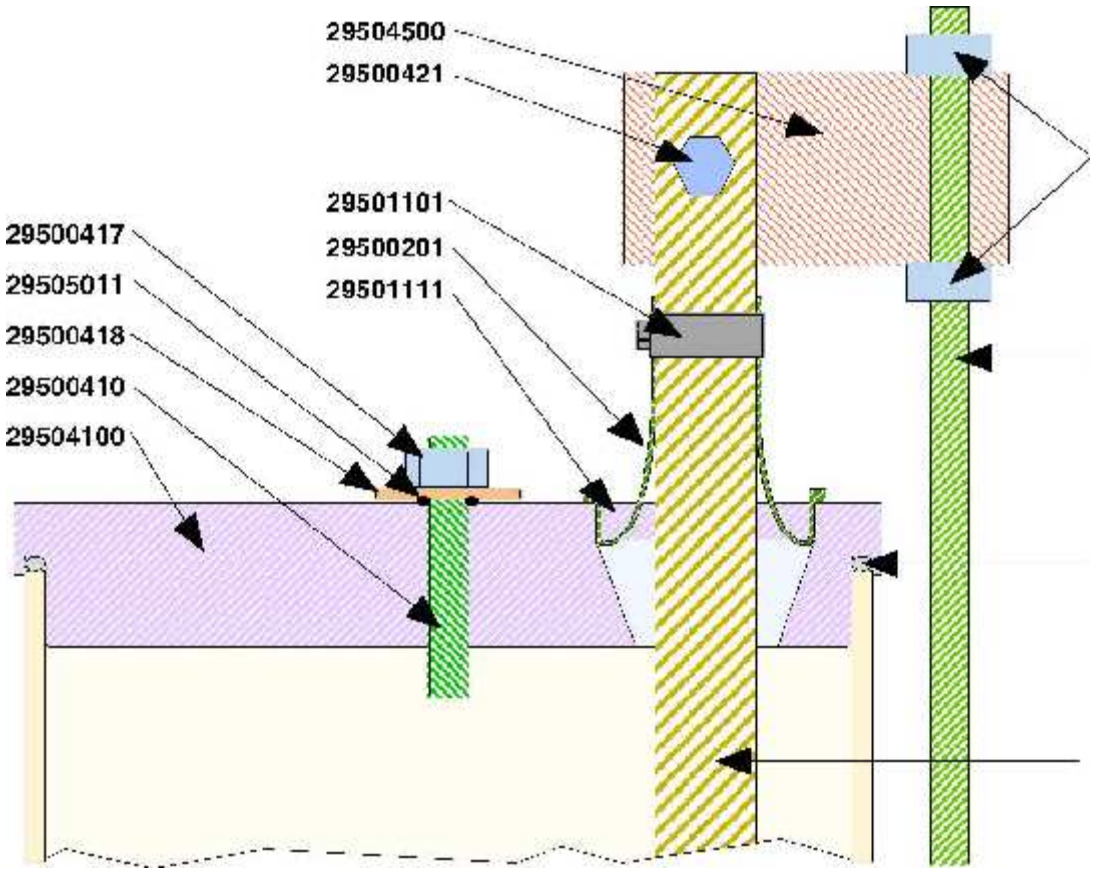
Lubricate the ends of the sight tube before installing. Insert one end of the sight tube into it's block using a twisting motion, then force the sight tube into a bow and insert the other end into it's block. While inserting the sight tube into its block, take care to not cut or damage the sight tube Orings.



PARTS IDENTIFICATION

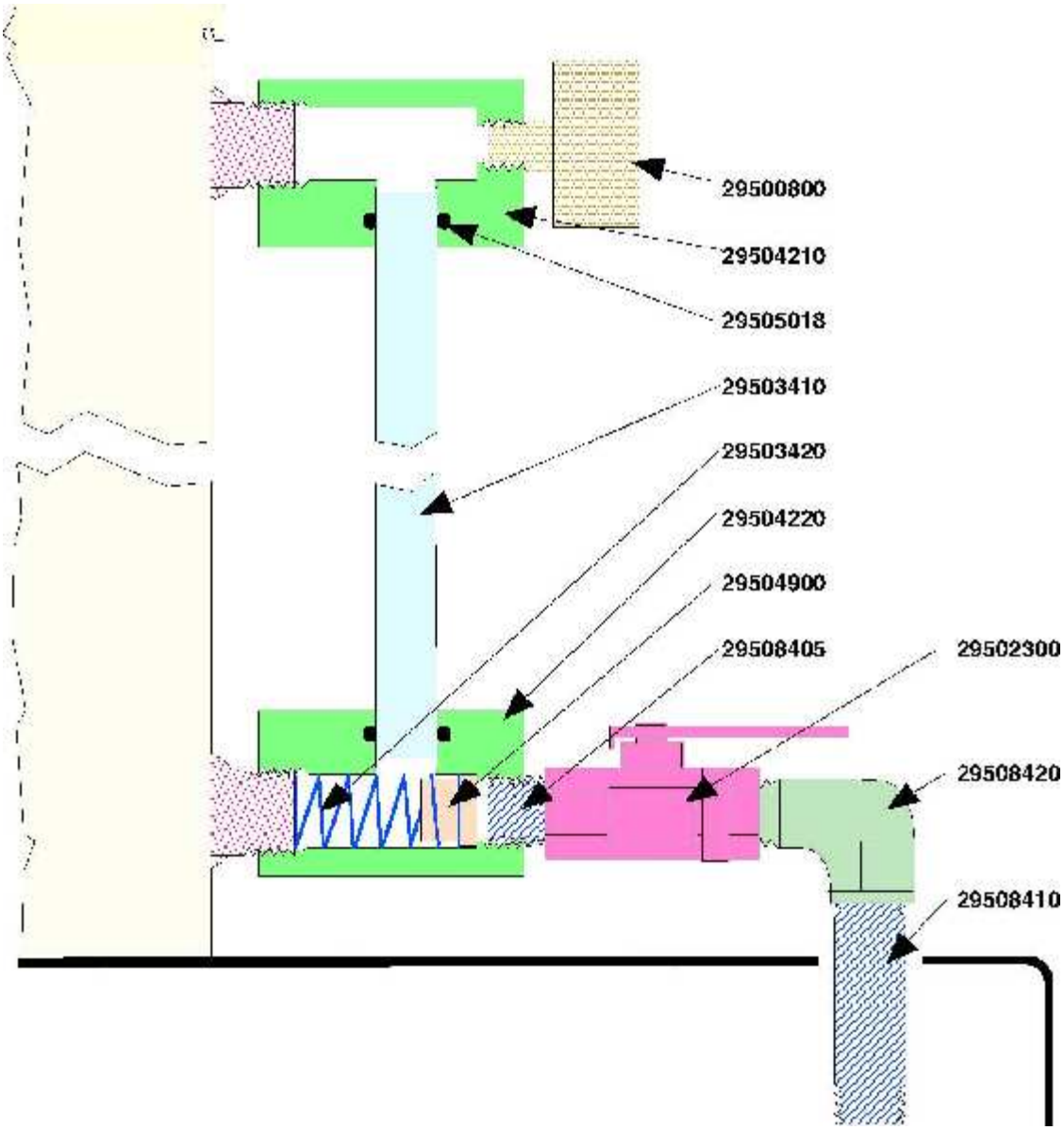
ASSEMBLY -TOP OF MEASURING CHAMBER

PART #	DESCRIPTION
29500201	RUBBER B O OT, EPDM
29500410	B OLT, TOP PLATE, 3/8”
29500417	NUT, 3/8” SLEF LOCKING
29500418	FLAT WASHER
29500421	B OLT & NUT, 1/4”
29501101	CLAMP, B O OT, SMALL
29501111	CLAMP, B O OT, LARGER
29501690	CONTROL ROD, 3/8” S.S.
29504100	TOP PLATE
29504505	CONTROL VALVE BLOCK
29505011	O RING, TOP PLATE BOLT
29505267	O RING, TOP PLATE GASKET
29506233	TRAFFING PIPE ASSEMBLY



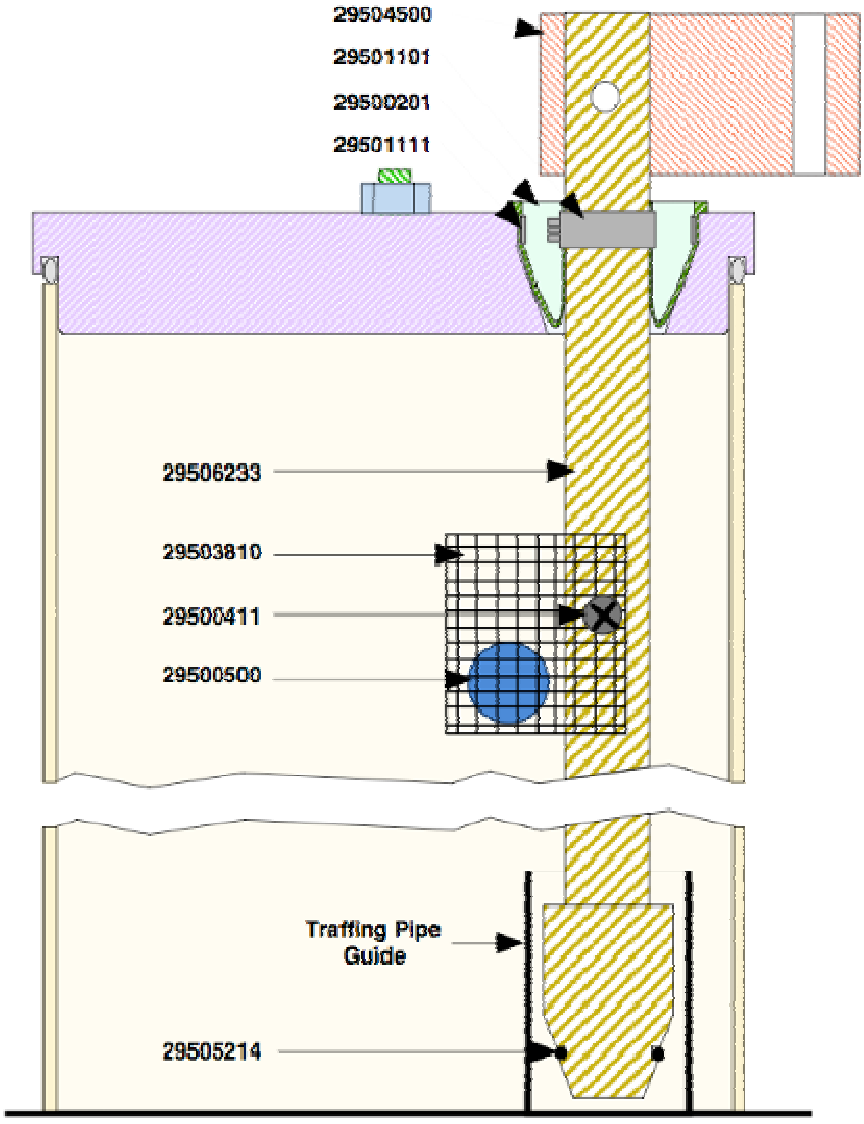
ASSEMBLY -SIGHT TUBE AND RINSE VALVE

PART #	DESCRIPTION
29500800	GUAGE, VACUUM
29502300	VALVE, RINSE, 1/2" BALL, S.S.
29503410	SIGHT TUBE, TEFLON
29503420	SPRING, S.S.
29504210	BL OCK, SIGHT TUBE, UPPER
29504220	BL OCK, SIGHT TUBE, LO W ER
29504900	BUTTON, POLY.
29505018	O RING, SIGHT TUBE, 2 Required
29508405	NIPPLE, 1/2" X CLOSE, S.S.
29508410	NIPPLE, 1/2" X 3", S.S.
29508420	STREET ELB O W, 1/2", S.S.



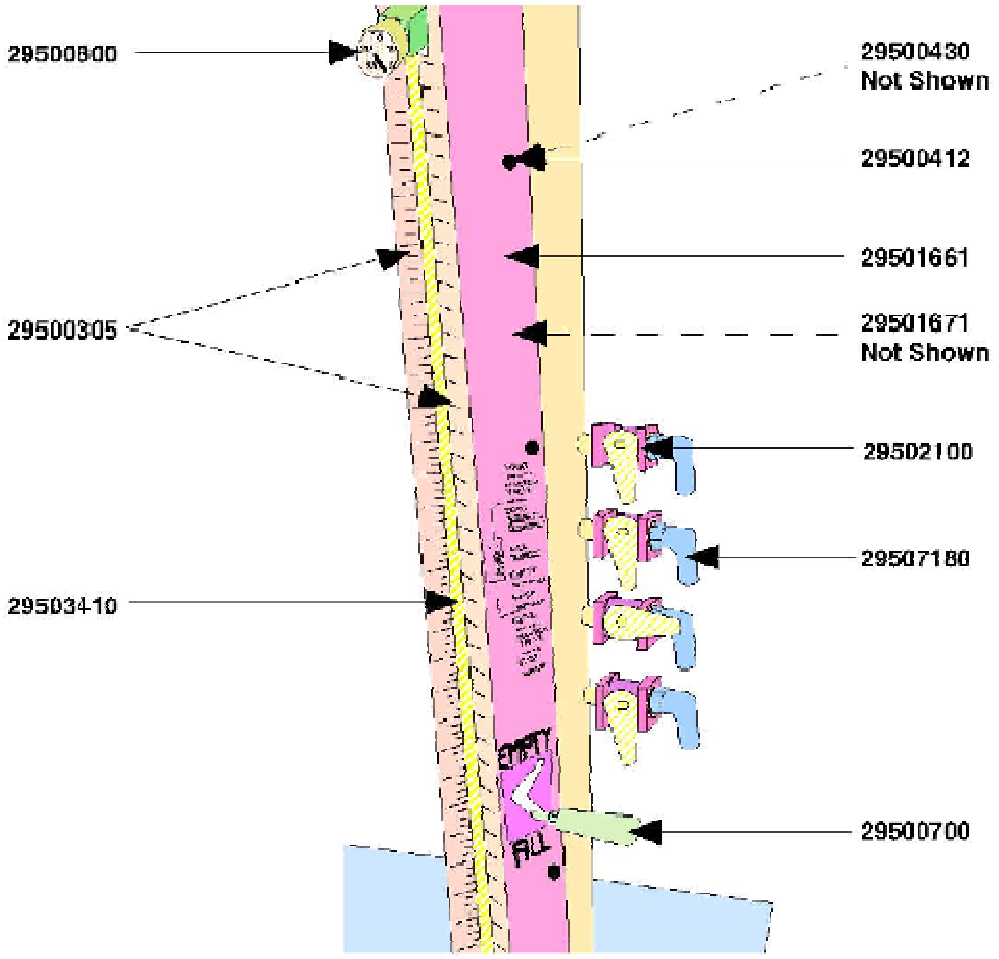
ASSEMBLY -TRAFFING PIPE

PART #	DESCRIPTION	PART #	DESCRIPTION
29500201	RUBBER B O OT, EPDM	29503810	BASKET, S.S., FLOAT BALL
29500411	SCRE W, #6 X 1/2", S.S.	29504500	CONTROL VALVE BLOCK
29500500	FLOAT BALL, POLY, 1"	29505214	O RING, CONTROL VALVE CONE
29501101	CLAMP, B O OT, SMALL	29506233	TRAFFING PIPE ASSEMBLY
29501111	CLAMP, B O OT, LARGE		



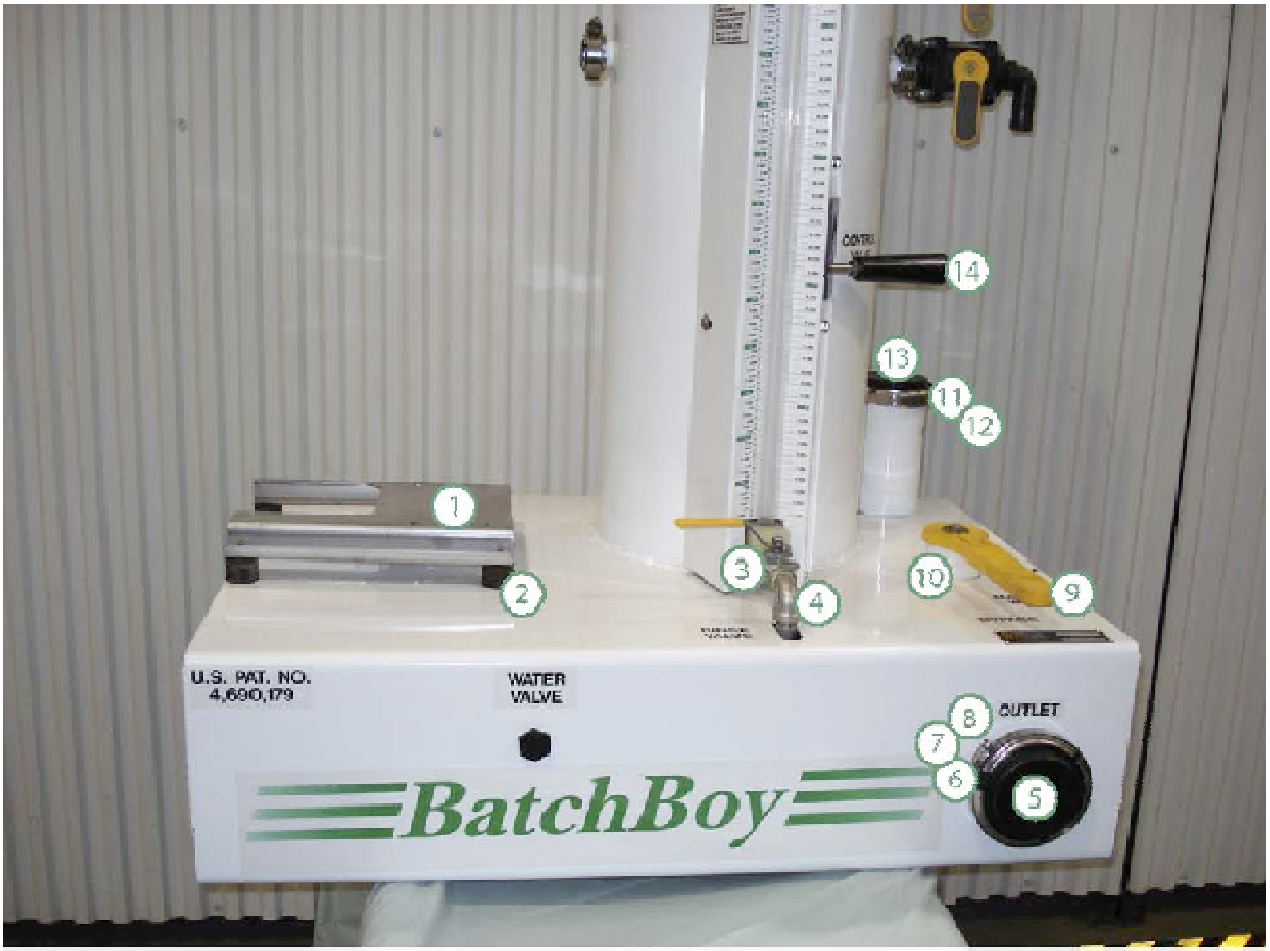
ASSEMBLY - OUTER MEASURING CHAMBER

PART #	DESCRIPTION	PART #	DESCRIPTION
29500305	GRADUATION SCALE SET ENGLISH & METRIC	29500800	GUAGE, VACUUM
29500412	BOLT, 1/4" X 1/2", S.S. 6 Required	29501661	OUTER BRACKET
29500430	CLIP NUT, 1/4" (Not Shown)	29501671	INNER BRACKET (Not Shown)
29500700	HANDLE, CONTROL VALVE	29502100	VALVE, 3/4", CHEMICAL INLET
		29503410	SIGHT TUBE
		29507180	HOSE BARB ELBOW

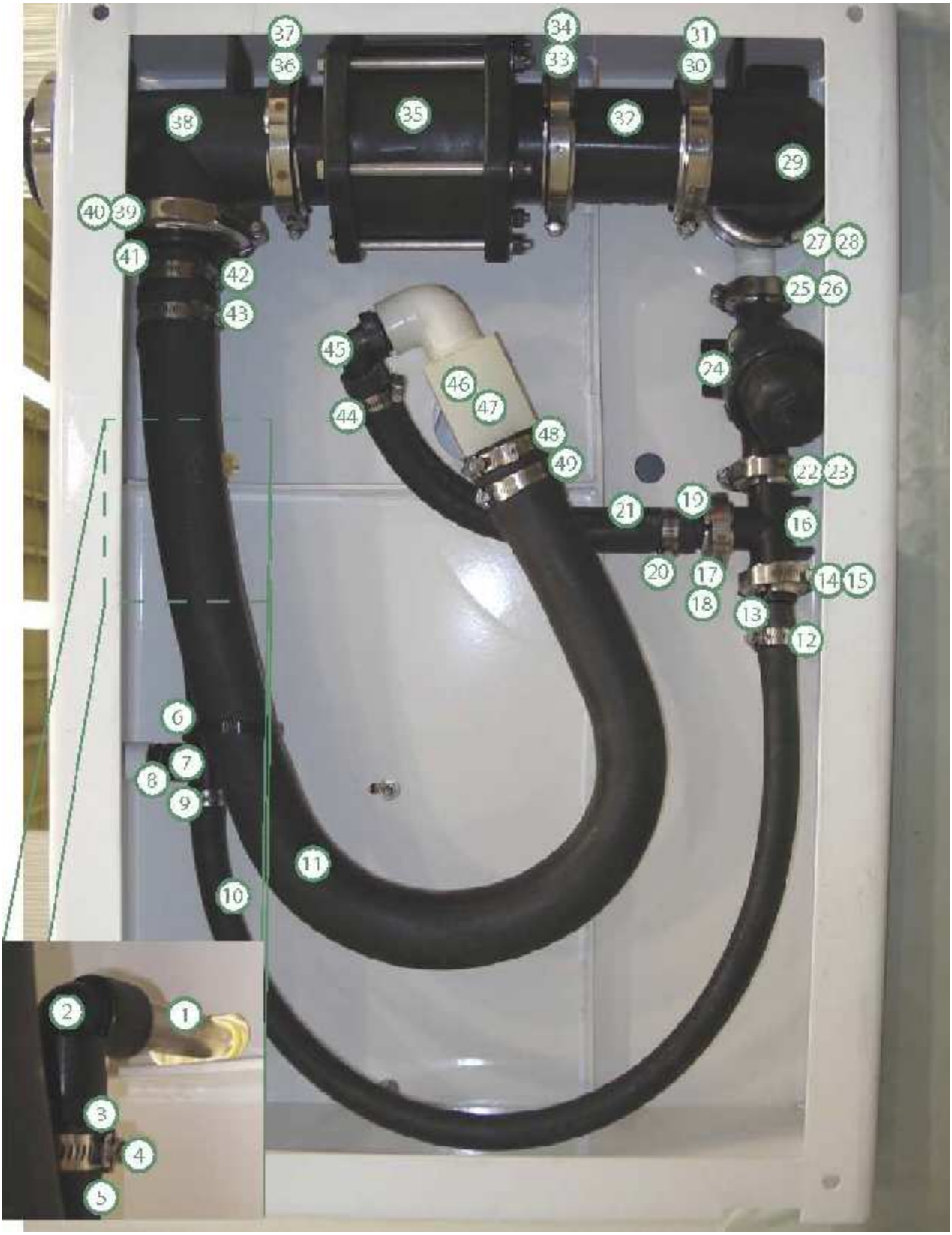


ASSEMBLY - BASE

REF #	PART #	DESCRIPTION
1	29500620	PLATE, PUMP MOUNTING
2	29500610	RUBBER FEET (4 REQUIRED)
3	29502300	VALVE, RINSE
4	29508429	STREET ELBOW, 1/2", S.S.
5,13	29507850	CAP, 3" FLANGE
6,11	29507912	CLAMP, 3"
7,12	29507913	GASKET, 3"
8	29504970	SPACER, 3"
9	29502510	HANDLE, MASTER VALVE
10	29504970	VALVE HANDLE EXTENSION
14	29500700	HANDLE, CONTROL VALVE



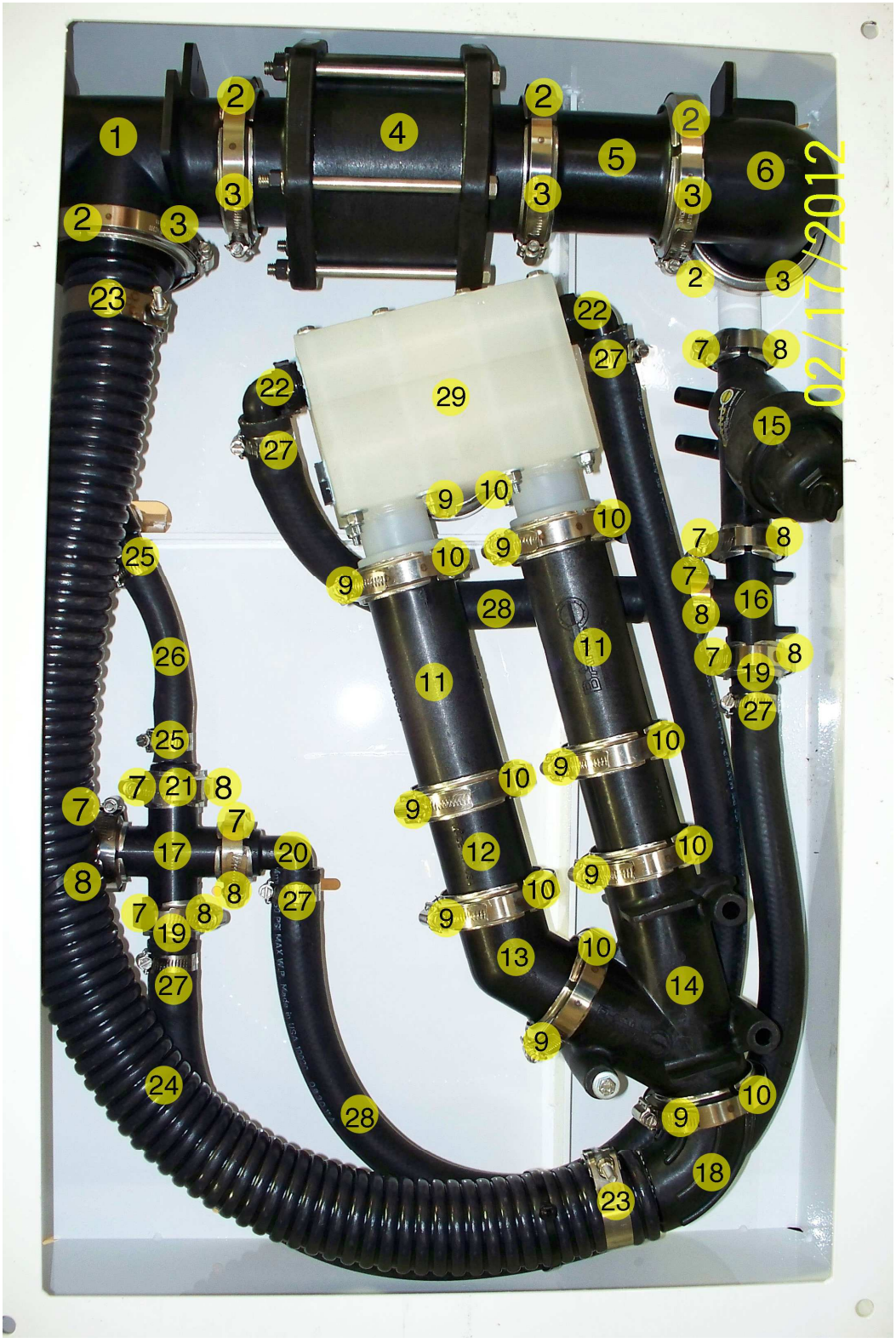
ASSEMBLY - UNDERNEATH THE BASE
Old Version – Pre 2012



ASSEMBLY - UNDERNEATH THE BASE (CONTINUED)

REF #	PART #	DESCRIPTION
1	29508410	NIPPLE, 1/2" X 4", S.S.
2	29506024	ELBOW, 1/2", POLY
3	29508540	HOSE BARB, 1/2" X 3/4", POLY
4,6,9,12	29501012	HOSE CLAMP, FOR 3/4", S.S.
5	29509070	HOSE, 3/4", EPDM, 6.5" LONG
7	29508530	HOSE BARB TEE, 3/4", NYLON
8	29506107	NIPPLE, 3/4" X CLOSE, POLY
10	29509071	HOSE, 3/4", EPDM, 39" LONG
11	29509501	HOSE, 2", EPDM, SPECIAL FORMED
13	29507190	HOSE BARB, 1" X 3/4" FLANGED, POLY
14,17,22,25	29507910	CLAMP, 1"
15,18,23,26	29507911	GASKET, 1"
16	29507780	TEE, 1" FLANGED, POLY
19	29507710	HOSE BARB, 1" FLANGED, POLY
20,44	29501016	HOSE CLAMP, FOR 1", S.S
21	29509100	HOSE, 1", EPDM, 15" LONG
24	29503800	STRAINER, 1" FLANGED, 8 MESH
27,30,33,36,39	29507913	CLAMP, 3"
28,31,34,37,40	29507913	GASKET, 3"
29	29507810	ELBOW, 3" FLANGED, POLY
32	29507820	COUPLING, 3" FLANGED, POLY
35	29502500	VALVE, MASTER, 3", POLY
38	29507840	TEE, 3" FLANGED, POLY
41	29507830	HOSE BARB, 3" X 2" FLANGED, POLY
42,43,48,49	29501032	HOSE CLAMP, FOR 2" HOSE, S.S.
45	29507170	HOSE BARB ELBOW, 3/4" X 1", POLY
46	29504410	VACCUM GENERATOR, JET ASSEMBLY
47	29503140	VENTURI

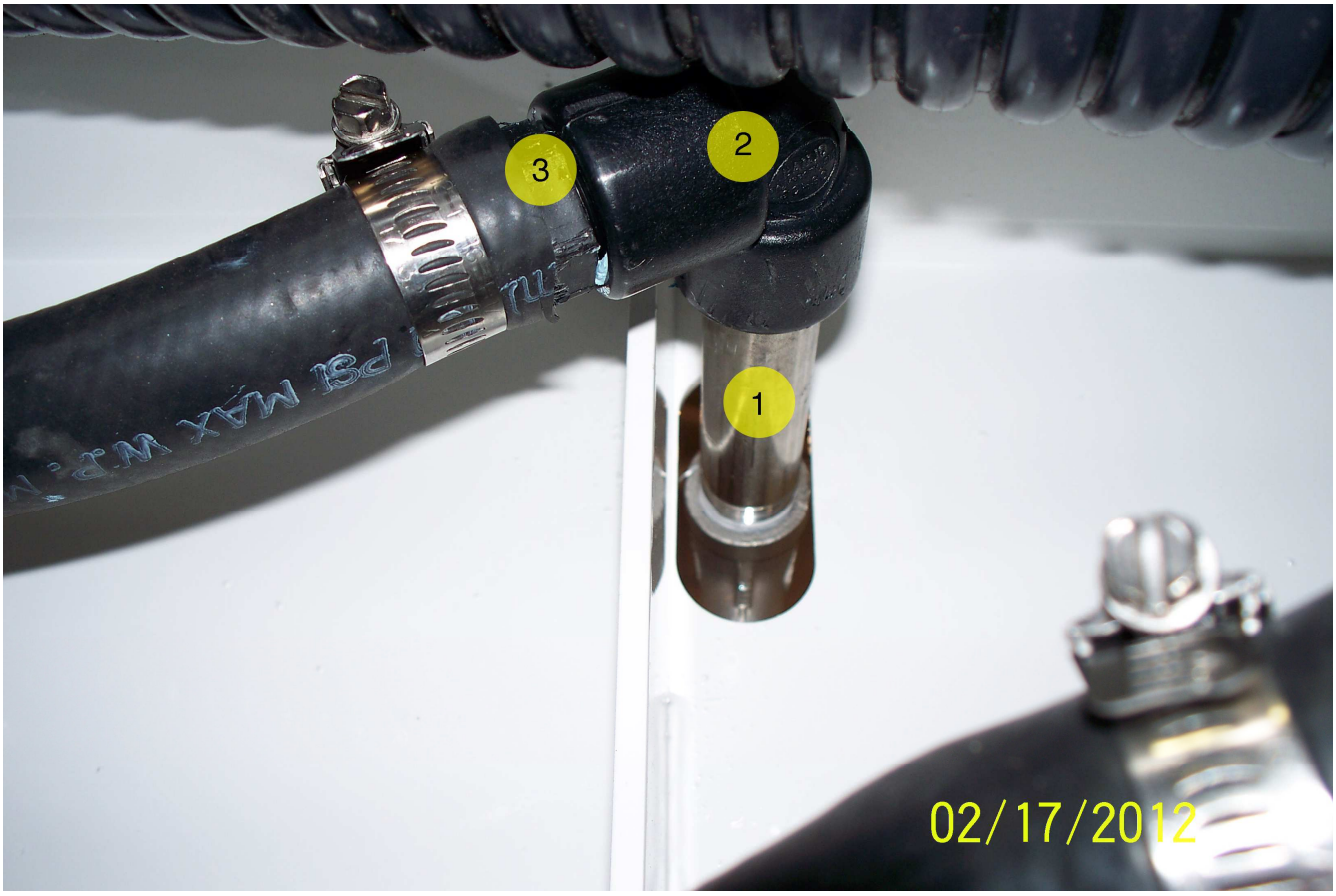
Assembly Underneath the Base - 1
New Version 2012



Parts List

1.	29507840	TEE	3”	Flanged Poly	
2.	29507912	Clamp	3”	SS	(5 ea.)
3.	29507913	Gasket	3”	EPDM Rubber	(5 ea.)
4.	29502500	Valve, Master	3”	Flanged Poly	
5.	29507820	Coupling,	3”	Flanged Poly	
6.	29507810	Elbow,	3”	Flanged Poly	
7.	29507910	Clamp	1”	SS	(8 ea.)
8.	29507911	Gasket	1”	EPDM Rubber	(8ea.)
9.	29507920	Clamp	2”	SS	(9ea.)
10.	29507921	Gasket	2”	EPDM Rubber	(9ea.)
11.	29507744	Coupling Long	2”	Flanged Poly	(2ea.)
12.	29507525	Coupling Short	2”	Flanged Poly	(2ea.)
13.	29507130	Elbow 45 deg	2”	Flanged Poly	
14.	29507740	Y 45 deg	2”	Flanged Poly	
15.	29503800	Strainer	1”	Flanged 8 Mesh	
16.	29507780	TEE	1”	Flanged Poly	
17.	29507782	Cross	1”	Flanged Poly	
18.	29507722	Elbow	2”	Hose Barb Poly	
19.	29507710	Hose Barb	1”	Flanged Poly	(3ea.)
20.	29507180	Hose Barb 90 deg	1”	Flanged Poly	
21.	29507520	Hose Barb	1”	Flanged x 3/4” Barb Poly	
22.	29507170	Hose Barb Elbow	1”	Poly	
23.	29500231	Hose Clamp	2”	SS T-Bolt	(2ea.)
24.	H020EPSD	Hose	2”	EPDM Rubber	(4ea.)
25.	29501012	Hose Clamp	3/4”	SS	(2ea.)
26.	H007EP	Hose	3/4”	EPDM Rubber	(2ea.)
27.	29501016	Hose Clamp	1”	SS	(6ea.)
28.	H010EP	Hose	1”	EPDM Rubber	(10ea.)
29.	29504412	Vacuum Generator Assembly			

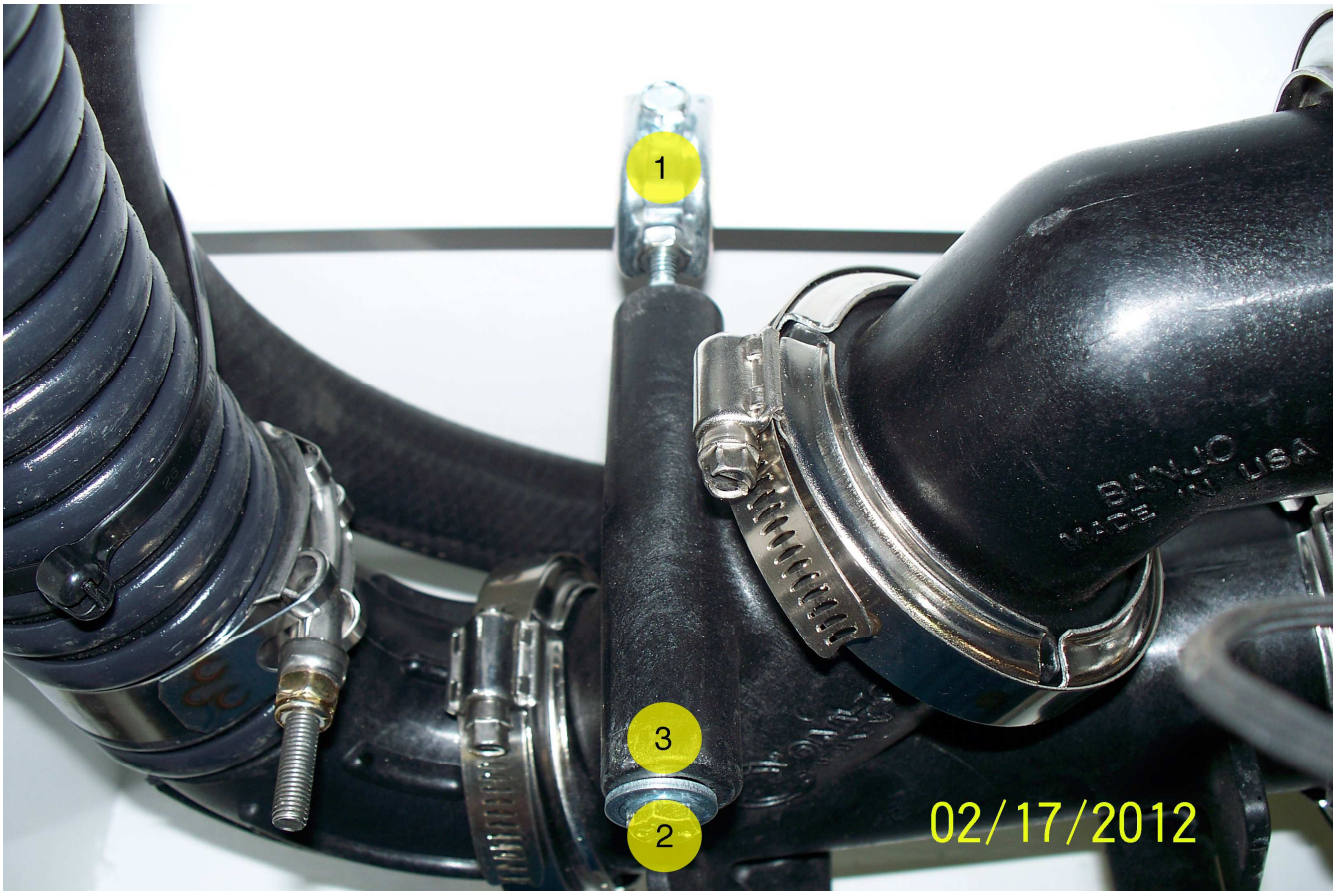
Assembly Underneath the Base - 2
New Version 2012



Parts List

1.	29508410	Nipple	1/2” x 4”	SS
2.	29506024	Elbow	1/2”	Poly
3.	29508540	Hose Barb	3” x 3/4”	Poly

Assembly Underneath the Base – 3
New Version 2012

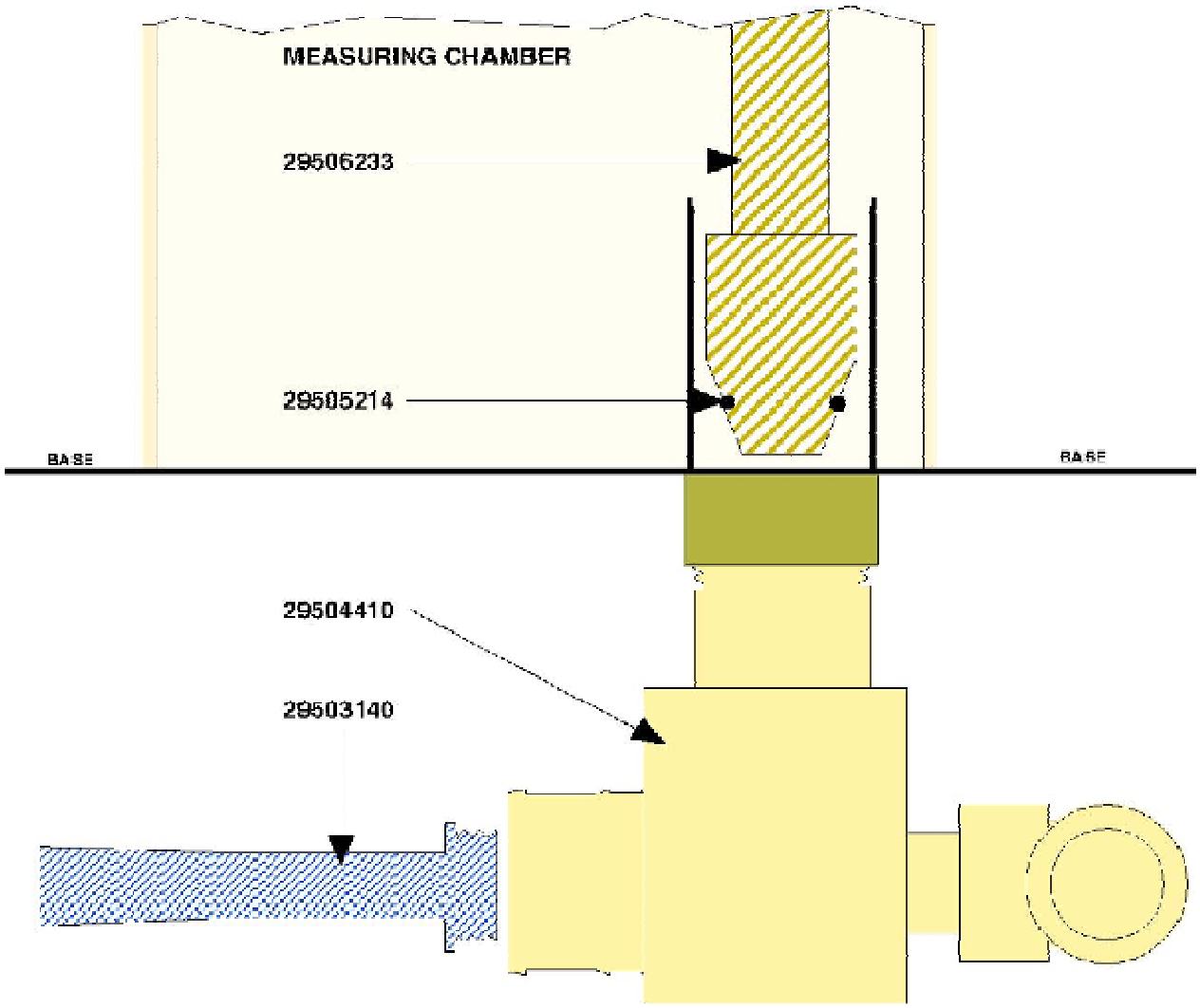


Parts List

1. 29501620	I-Beam Clamp		Zinc
2. 29500425	Bolt	1/4” x 5 1/2”	Zinc
3. 29500427	Washer	1/2”	Zinc

ASSEMBLY - VACUUM GENERATING JET

PART #	DESCRIPTION	PART #	DESCRIPTION
29503140	VENTURI, (Shown unthreaded from the jet assembly.)	29505214	O RING, CONTROL VALVE
29504410	VACUUM GENERATOR, JET ASSEMBLY	29506233	TRAFFING PIPE ASSEMBLY



FREQUENTLY ASKED QUESTIONS

Do you need to pump the chemical into the machine?

*No. The **BatchBoy** makes it's own vacuum and uses this vacuum to draw chemical into the measuring chamber. You do not need a chemical pump to pump liquid into the machine. The unit fills itself, it is self filling.*

Is the chemical stored inside a tank in the base of the machine?

*No. There is no tank in the base of the machine. The chemical is stored in the container you bought the chemical in. The base of the machine is hollow, houses some plumbing and functions as a mounting base for the **BatchBoy** and your transfer pump.*

How is the BatchBoy better than a meter?

*Four chief reasons: 1) If you use 4 different chemicals, you would need 4 meters. The **BatchBoy** can handle 4 chemicals (more if you manifold more chemical valves to the chemical inlet ports); 2) The **BatchBoy** measures true liquid volume, it does not measure air, it does not care about viscosity; 3) The machine never needs to be calibrated, it will be as accurate 10 years from now as it is today; 4) You can measure very small amounts, down to an ounce, no meter can indicate only an ounce of liquid.*

Do you need to be pumping water through the machine to use it?

Yes, water needs to be passing through the machine for the machine to function. You need to be filling your sprayer when you use the **BatchBoy**.

Can you get all the chemical into the sprayer tank before the tank gets full of water?

Yes. Typically a sprayer operator will have all his chemical in his sprayer and find that the sprayer tank is about half full. When transferring chemical to the sprayer, the Master Valve is positioned to VA CUUM and the water flow rate to the sprayer tank is reduced to 10 - 14 GPM. After all the chemical is in the sprayer, the Master Valve is moved to BYPASS and then the sprayer tank can be topped off at the normal maximum flow rate of the transfer pump.

My sprayer tank is only 100 gal., can I still get all the chemical in before the tank gets full?

Yes. The sprayer tank size does not matter. What matters is the ratio of chemical to water in the tank. A larger tank needs more chemical and a smaller tank needs less chemical. Under normal operating conditions the **BatchBoy** transfers chemical fast enough to achieve a ratio of 1/5th chemical, or in other words, a 100 gal. tank can be 20 gals. of chemical and 80 gals of water and likewise, a 1000 gal. tank can be 200 gals. of chemical and 800 gals of water. Normally this is a much higher concentration than most people need. With a fine tuned system, you can achieve a 1/3rd ratio of chemical to water, or a 100 gal. tank can be 33 gal. of chemical and 66 gal. of water.

Can you rinse the BatchBoy?

Yes, the machine is designed with a rinsing feature. After each batch of chemical passes through the measuring chamber, the chamber is easily rinsed by simply opening the rinse valve for a few seconds. The whole machine is rinsed, the sight tube, the measuring chamber, the vacuum venturi, the valves, and all plumbing.

Where does the rinse water go?

Into the sprayer tank.

How do you winterize the machine?

The lowest point of the machine is the outlet port. Everything will drain out this port. All you need to do is open all valves and let everything drain out the outlet port. You do not need to blow it out with air or add anti-freeze.

Will the BatchBoy rust or corrode?

No. The measuring chamber is Stainless Steel, everything that comes in contact with liquid is either Stainless Steel or plastic.

Will the sight tube stain?

Eventually the sight tube may stain. The tube is made from teflon, which is very slippery, very slick, and will not absorb liquids. It is also rinsed each time

the rinse valve is opened, in fact, rinse water is first sent through the sight tube before it enters the measuring chamber at the top. If the sight tube does stain, it can very easily be replaced, without tools.

Can you run 28% liquid fertilizer through the BatchBoy?

Yes, everything that 28% liquid will contact is made from either Stainless Steel or plastic. 28% liquid can be used as the carrier or as an additive. Be sure to check compatibility first.

Where is the vacuum pump?

There is no vacuum pump. The **BatchBoy** makes it's own vacuum, by passing water through a venturi.

Can you pre-batch with the BatchBoy?

No, the **BatchBoy** is meant to replace pre-batching. With a **BatchBoy**, rather than pre-batch, you make the batch when you need it, where you need it, and how much you need. You can think of it as making the batch as you fill the sprayer.

What makes the vacuum?

A venturi located under the base. As water is traveling through the venturi, it creates a vacuum.

What if you put too much chemical in the measuring chamber?

The same thing happens that will happen if you accidentally run too much chemical through your meter, or the same thing that will happen if you accidentally pour too much chemical into your sprayer tank. It is too late. At some point in time you will cross beyond the point of no return, and filling the measuring chamber with chemical is on the other side of the point of no return. As an operator, you need to plan what you want to do and you need to be paying attention to what you are doing.

How fast does it fill?

Filling time depends on many variables, the performance of your transfer pump, the length and size of the plumbing line from the **BatchBoy** to the chemical containers, the viscosity of the chemical, the elevation of the chemical containers with respect to the **BatchBoy**, the plumbing line going to the sprayer, etc. Under average, normal conditions, the **BatchBoy** will fill it's chamber in 1 1/2
-2 minutes. It takes 1/2 - 1 minute to empty the chamber.

What is the cone tank for?

It becomes a very useful utility tank. It can be used to make powdered chemicals into a slurry, a place to add neutralizer so it can be drawn into the system to neutralize the system between incompatible chemicals, a place to add chemicals that happen to come in very difficult containers, etc.

Can you go from one chemical to the next without cross contamination?

Generally you can if you rinse the machine between each batch and the chemicals are compatible. The machine

is designed so there are no pockets, low spots, or loops in plumbing where chemical can become trapped. The rinsing function does a very good job of rinsing all residual chemical off the walls of the measuring chamber and out the plumbing. However, because the **BatchBoy** is not perfect, if you are handling sensitive chemicals or there is a great risk from carryover, then we recommend running some neutralizer through the machine as a safety precaution.

How do you get chemical out of shuttles?

Adapters are generally available that allow a suction hose from the **BatchBoy** to be attached to the shuttle. Most shuttles and closed containers already have a draw pipe inside so chemical can be drawn out through an adapter.

Does the chemical go through the transfer pump?

No, chemical goes directly into the measuring chamber, and then directly to the sprayer. Your transfer pump never comes in contact with the chemical.

Why is the rinse valve Stainless Steel?

You can use 28% liquid fertilizer as a carrier and therefore the rinse valve needs to be Stainless Steel. If you use 28% as a carrier, then 28% will also be the liquid used to rinse the machine.

What if I want to put more than 12 gallons into my sprayer?

You need to do multiple batches of that chemical. You can have the first batch be 10 gallons, and the second batch the balance (easier to do the math in your head). A larger measuring chamber would not make it go any faster as the speed is a function of the speed of the venturi and not a function of the size of the measuring chamber.

Will a 1 1/2" pump work?

Yes, in fact you need only about 15 gpm and 25 psi to make the **BatchBoy** work. A 1 1/2" transfer pump will easily operate the **BatchBoy**.

Will it draw chemical from a drum on the ground?

Yes, however the extra elevation the chemical needs to be lifted will slow down the transfer rate.

When you use a vacuum, where do all the fumes and vapors go?

All vapors and fumes are injected back into the water by the venturi, they get mixed into the water and end up in your sprayer tank. Systems that use a vacuum pump can create vast amounts of vapor and these vapors are usually discharged into the atmosphere in close proximity of the operator.

What is the warranty?

1 year warranty against inferior materials and faulty workmanship. Such items as sight tubes becoming stained or incompatibility with chemicals are not covered under warranty.

We offer a satisfaction guarantee, if the machine does not perform to your satisfaction, we will refund your money.

How accurately does it measure liquid?

The **BatchBoy** measures liquid volumetrically, it contains a specific volume of liquid per height that the measuring chamber is filled. Accuracy of measuring the volume of liquid in the measuring chamber becomes accuracy of measuring the height of liquid in the measuring chamber. The graduation scale is broke down into fluid ounces of liquid and each marking on the scale represents 2 fluid ounces. As with a tape measure, the sharper your eye, the more clearly and distinctly you can read the height of liquid in the measuring chamber, and hence, the volume of liquid in the measuring chamber. It is easily possible to measure a single fluid ounce of liquid.

How much vacuum does it take to draw chemical into the measuring chamber?

Under most general conditions it will take from 7" to 15" of vacuum to draw chemical into the measuring chamber. The actual amount of vacuum required to draw chemical depends on many factors, such as how long the suction lines are to the chemical containers, how high the chemical has to be drawn vertically, the size of the suction line, the viscosity of the chemical, the number of elbows, tees, and other restriction in the suction line, how fast the chemical is being drawn, etc. The harder it is to draw the chemical, the higher the vacuum level the machine will need to create to be able to draw the chemical. The vacuum gauge at the top of the machine indicates the actual vacuum being created while drawing chemicals, which in turn indicates how hard it is working to draw in the chemical.

How much vacuum can the machine make?

The machine can create over 20" of vacuum, usually much more vacuum then is actually needed to draw chemicals into the measuring chamber. The Stainless Steel measuring chamber along with the rest of the machine are sturdy enough to handle this vacuum without collapsing.

Does the BatchBoy take the hazard out of handling chemicals?

Handling chemicals is hazardous. The **BatchBoy** does not diminish the hazard, the hazard is still there. The machine only allows you to cope with the hazardous environment more safely. You still need to protect yourself from the hazards of handling chemicals by wearing all protective clothing and equipment recommended, and following all other safe practices.

SPECIFICATIONS

Height	*Overall unit height*	76"
Base		
Width	*From front to back*	24.5"
Length	*From side to side*	36.5"
Height	*To top of the base*	9"
Weight	*Total unit weight, empty*	397lbs.
Mounting Holes	*Number of mounting holes*	4
Length	*Distance between holes, side to side*	33 1/2"
Width	*Distance between holes, front to back*	21 3/4"
Size	*Size of hole*	3/8"
Material of Construction		
Measuring Chamber	*All metal exposed to chemical*	Stainless Steel
Base	*Mounting base*	Stainless Steel
Plastic	*Components exposed to chemical*	Polypropylene
Elastomers	*Orings and the rubber boot*	Viton
Sight Tube		Teflon
Hoses		EPDM
Plumbing	*Plastic plumbing fittings*	Polypropylene
	Metal plumbing fittings	Stainless Steel
Measuring Chamber		
Capacity	*Total capacity of chamber*	27 gallons
Plumbing Connection		
Inlet	*Pipe thread size, female.*	3" Flange
Outlet	*Pipe thread size, female*	3" Flange
Chemical Valves	*Number of ports*	8
	Number of valves	4
Size	*Pipe thread size*	1"
Graduations		
English	*Gallons , Quarts, Pints, Ounces*	4 Ounces
Metric	*Liters*	1/10 Liter
Pump Mounting Plate		Holes drilled for most 3hp & 5hp gas engines

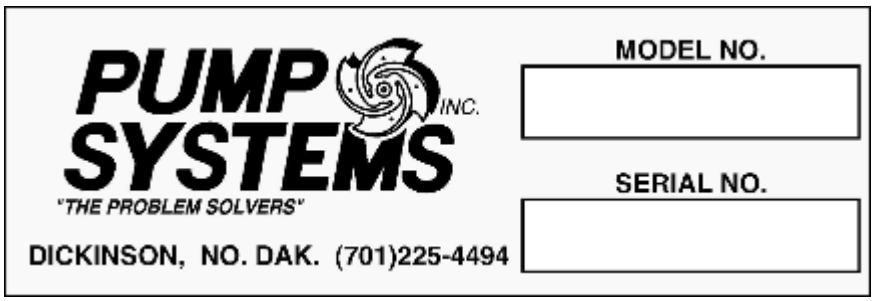
NOTES

We trust you've read this manual in it's entirety. There are two important messages you need to understand.

Formost is SAFETY. You are responsible for your own safety. Do not depend on the *BatchBoy* to lessen the hazdards of handling chemicals.

Frequent and thorough rinsing, using the Rinse Valve, is the simplest and most important task you can do to keep your *BatchBoy* operating like new.

If you haven't read the manual, please do so before using the *BatchBoy*.



Identify all possible hazards. Determine what safeguards are needed and implement them. **Only you, the user***, understand your product and system characteristics fully.* ***The ultimate responsibility for safety is with you****.* ***Your safety ultimately rests in your hands****.* ***Do your part*** *and you will enjoy a safe environment for years to come.*

Warranty

The ***BatchBoy*** *warranty is for 1 year against defects, defective materials, and poor workmanship and is limited to repair or replacement at our option. Beyond the preceding, there are no warranties, expressed or implied. There is never any warranty of fitness for a specific purpose, and there is never any liability undertaken by our company for consequential damages.*

Patent / Trademark

The ***BatchBoy*** *and it's method of use are protected by U.S. Patent No. 4,690,179.*
BatchBoy*® is registered in the U.S. Patent and Trademark Office, Reg. No. 2,071,182.*

Copyright