

# **Operating Instructions**

## **Pressure Pot Operating Instructions**

The first step to any great project is to ensure the unit is hooked up to the Air compressor and the compressor is full of air and turned on. You may well laugh but I have spent some frustrating minutes trouble shooting the system only to find out one of the above things has not been done.

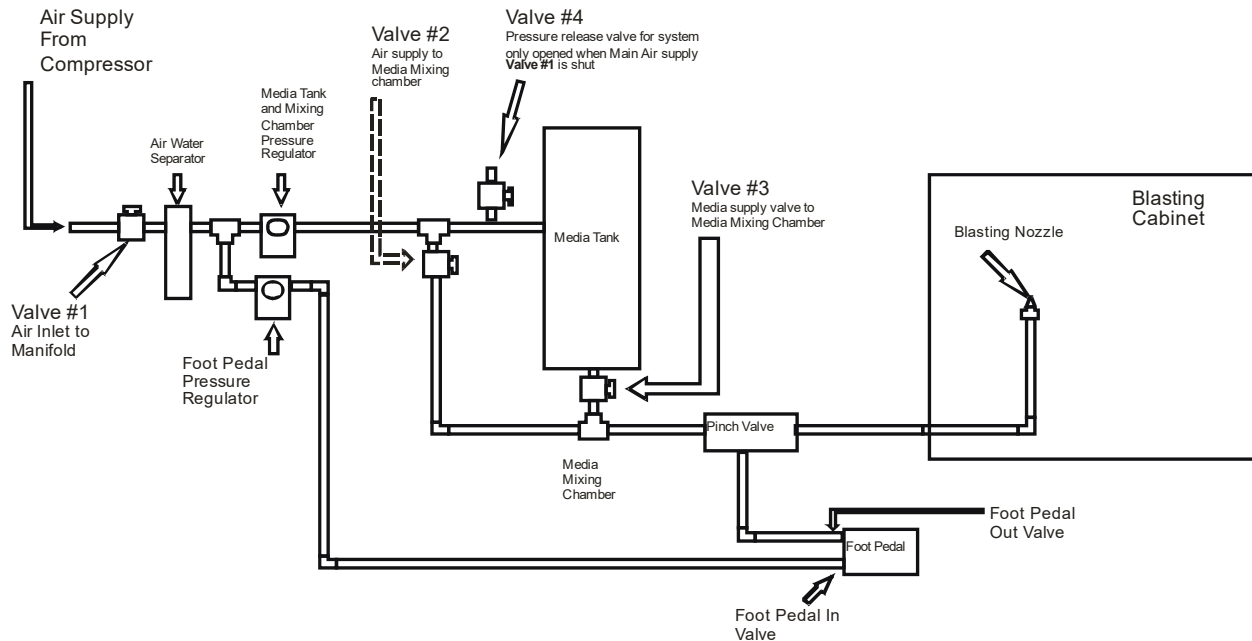
The air supply to the units manifold should go through an air dryer/water separator before it reaches the manifold itself. There is a dryer/water separator on the manifold itself but a double unit will ensure that the air supplied is moisture free. Moisture getting into the media can create all sorts of problems which are frustrating and time consuming to rectify.

The main air supply pressure to the unit should not exceed 120 psi or 8.3 bars, any higher can possibly damage the pressure regulators. The main Media tank pressure during use will normally be between 20-40 psi (1.4 – 2.75 bar). The required control pressure for the foot pedal and pinch valve is 20-40 psi (1.4 - 2.75 bar) greater than the Media pressure pot pressure. Use of excessive pressure beyond that will result in complete closure of the pinch valve and affect the sleeve life. Use of activation pressure above 90 psi for the pinch valve is not recommended.

If you have read other explanations of a pressure blasting system you may notice that they call the valve on the bottom of the media tank the mixing valve. As an engineer I find this not quite right, as the mixing is not done in the valve itself but below it. So for this system I call that valve the media supply valve. It supplies the media to the chamber below it where the air and media meet and are mixed to flow to the nozzle. I call the chamber the media mixing chamber, these are small differences but I think they are more descriptive of what the parts actually do.

# Pressure Pot Operating Instructions

## Complete System Diagram



The great thing about a Pressure Pot unit is that it uses lower operating pressures and lower volumes of air to operate.

### Filling the Pressure Pot

The first step in your journey to etching greatness is to fill the pressure pot with media.

**Caution; Use a dust mask during the filling.** Ensure **Valve #3 (Media Supply to the Mixing Chamber)** is closed. Unscrew the tank top and inset a funnel into the tank neck. Slowly pour in the media, when the media tank is about  $\frac{3}{4}$  full, stop filling. Clean the thread of the tank neck, check the rubber gasket on the cap is in place before screwing down the tank cap.

### Getting Ready to Blast

Before connecting the main air supply first ensure the following valves are in the closed position. **Valve #1 (Air inlet to manifold)**, **Valve #2 (Air supply to mixing chamber)**, **Valve #3 (Media Supply to the Mixing Chamber)**; and **Valve #4 (Main system pressure release)**. If **Valve #2 (Air supply to mixing chamber)** and **Valve #3 (Media Supply to the Mixing Chamber)** are not closed you may start blowing media into your cabinet before you are ready. If **Valve #4** is not close it will vent all air pressure to atmosphere and scare the wits from you and anyone in the general vicinity.

## Pressure Pot Operating Instructions

Now that all the valves are in a safe position connect your air compressor to the main manifold, make sure that **Valve #1(Air inlet to manifold)** is closed when hooking up the air supply. This will avoid any pressure shock to the regulators and prolong their life.

Once the main air supply is connected slowly open **Valve #1(Air inlet to manifold)** and pressurize the manifold.

Adjust the Media Tank and Mixing Chamber Regulator, this is the larger regulator. Start by using about 30 psi (2 bars) in the tank, allow the air pressure to fill the tank and stabilize before proceeding.

Now adjust the Foot Pedal/Pinch Valve regulator, the smaller regulator, using about 50 psi (3.5 bars). This should be a good starting point to adjusting the system.

Step on the foot pedal, you should hear a small rush of air as the air pressure from the pinch valve is exhausted via the foot pedal. For an explanation on how the foot pedal and pinch valve work see drawings on pages 9 – 10 -11.

Now it is time to set up the unit to try your first blasting trial. Slowly crack open **Valve #2 (Air supply to mixing chamber)** start with a quarter open. This valve supplies the air pressure that will move the media through the hose to the cabinet.

Crack open **Valve #3 (Media Supply to the Mixing Chamber)** start with a quarter open.

Go to the cabinet and check the nozzle, there should be no media flowing from it, if there is you will need to adjust the pressure on the Foot Pedal air regulator upwards until the flow just stops.

Take the nozzle in your hand and making sure that the cabinet door is closed and you are not pointing the nozzle at the glass window, press the foot pedal. You should now get a steady flow of media.

If you do not get a flow of media open **Valve #3 (Media Supply to the Mixing Chamber)** a bit more and try again. To get the proper amount of air pressure and media flow from the nozzle is a bit of a balancing act between **Valve #2 (Air supply to mixing chamber)** and **Valve #3 (Media Supply to the Mixing Chamber)**.

Keep making slight adjustments to the two valves until you are happy with the results.

## Pressure Pot Operating Instructions

### Some Random Thoughts

The mixture of media to air pressure is a personal preference, some like more, some like less. More air pressure means a more aggressive cutting action, less air pressure a gentler cutting action. The balance is something you will be playing with for a while until you find the sweet spot for you. This being said the different pressures of air and amounts of media can be used to produce different effects in shading and carving. There can be too much media introduced into the air stream, this does not make the blasting go faster, it just means you are emptying your pot more often and creating lots of dust inside the cabinet and overwhelming your vacuum system. Too much air pressure can lead to you blasting through or lifting the resist off of the glass ruining your project. The ideal situation is to have just enough media in the air stream to etch at your desired speed. The main trick to good etching, besides lots of practice, is patience, check the resist is properly installed, check the areas you do not want etched are covered, and take your time. Speed can ruin a project very quickly, remember the old saying, there is never time to do it right but there is always time to do it over.

There are different size nozzles available which produce different effects as well as different sizes of media grits. The kit comes with a carbide nozzle, which is made of a very hard material and will last for many hours of blasting. There are nozzles of different materials out there, some soft some hard in a range of different prices. The ceramic nozzles are the softest and will last only a short time and go from fine to fire hose in an hour of use. The other end is a Rock Tech nozzle; they are very expensive but will last 3 to 4 times longer than even the carbide nozzles. We went for the mid range nozzle hardness in this kit, it is a good performer and if you find yourself doing mega hours of blasting then maybe move up to a more expensive nozzle.

### Emptying the Media from the tank

If you need to empty the media to clean the tank or replace it with a different grit, this system has a drain plug. The plug is located on the bottom of the media mixing chamber. To empty the tank, first put it up on blocks to allow the media to flow into a container for recovery. You will need to wear a dust mask for this job. When the tank is positioned over the container, dial down the air pressure on the large regulator to about 10 – 15 psi (.5 – 1 Bar), shut off **Valve #1(Air inlet to manifold); Caution; high pressure air, use eye protection and stay clear of the valve outlet**, slowly open up **Valve #4 (Main system pressure release)** and bleed off the tank pressure. When the tank is drained close **Valve #4 (Main system pressure release)**, then close **Valve #2 (Air supply to mixing chamber)**. Remove the plug from the bottom of the mixing chamber, make sure you have eye protection and are wearing a dust mask, open **Valve #3(Media Supply to the Mixing Chamber)** fully, then slowly open **Valve #1(Air inlet to manifold)**, you should get media flowing into the container, if not give the tank a shake to

## Pressure Pot Operating Instructions

break up any jams. When the tank is empty close **Valve # 3(Media Supply to the Mixing Chamber)** and replace the drain plug. Now you can refill the tank as per filling instructions.

### Trouble Shooting

#### Only air flowing from the nozzle but no Media

**Problem 1** – Media is packed in the bottom of the tank and not flowing to the mixing chamber

**Solution** – Rock the tank back and forth to break up the media block

**Problem 2 - Valve #2 (Air supply to mixing chamber)** - too wide open you will get too much air pressure to the mixing chamber which can lead to the air pressure overcoming the media flow from the bottom of the tank and you will get no media to the nozzle.

**Solution** -close the valve slowly and step on the foot pedal and see if media is now flowing with the air.

**Problem 3- Valve # 3(Media Supply to the Mixing Chamber)** - not open; no media flowing into the mixing chamber

**Solution** - slowly open the valve to allow media to flow to the mixing chamber. Step on foot pedal and see if the media is now flowing with the air.

#### Very weak air and media stream from nozzle

**Problem 1 - Valve #2 (Air supply to mixing chamber)**-not open enough

This will result in not enough air pressure to move the media down the hose and you will get a very weak media stream from the nozzle.

**Solution** – Slowly open **Valve #2 (Air supply to mixing chamber)** while stepping on the foot pedal, until a good flow of media is coming from the nozzle.

#### No Media or Air flowing from the nozzle

**Problem 1** – No air pressure to the unit

**Solution** – Check air supply **Valve #1(Air inlet to manifold)** is open and compressor is running

**Problem 2** – **Valve #2(Air supply to mixing chamber)** is closed, no air supply to the mixing chamber

## Pressure Pot Operating Instructions

**Solution** – Open **Valve #2 (Air supply to mixing chamber)** a quarter then step on foot pedal to test flow

**Problem 3 - Valve #3 (Media Supply to the Mixing Chamber)** is too wide open.

This will allow too much media to flow to the mixing chamber and plug it up. In this case the media will back up against the closed pinch valve and when you step on the foot pedal you will plug the hose up with too much media.

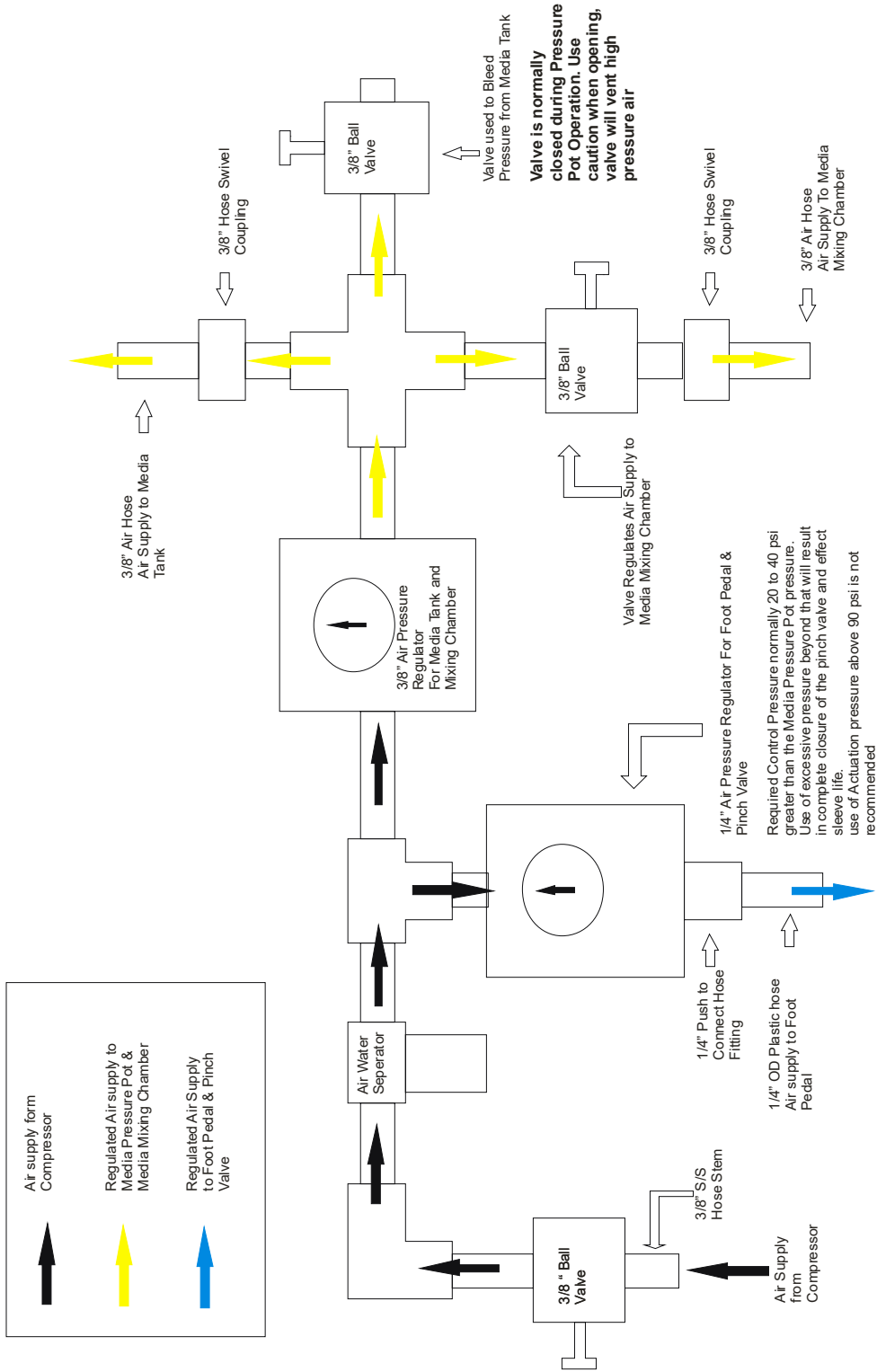
**Solution** - close **Valve #3 (Media Supply to the Mixing Chamber)** off completely, unscrew the nozzle holder and remove it and the nozzle from the end of the hose, be very careful not to lose the shims inside the nozzle holder. Open up **Valve #2 (Air supply to mixing chamber)** wide and step on the foot pedal, you should get a solid stream of media out of the hose. When the stream stops step off the foot pedal, close **Valve #2 (Air supply to mixing chamber)** back to the quarter open position and slowly open **valve #3 (Media Supply to the Mixing Chamber)** to re-introduce the media flow into the mixing chamber.

If this does not solve the problem close **Valve #2 (Air supply to mixing chamber)** and **Valve #3 (Media Supply to the Mixing Chamber)** undo the clamp on the ½" heavy duty hose where it is attached to the outlet of the pinch valve, remove the hose and empty the contents of the hose into a container. Do not dump it on the floor; keep it clean as it can be put back into the tank. Open **Valve #2 (Air supply to mixing chamber)** slowly while stepping on the foot pedal, this should blow out any media filling the mixing chamber and pinch valve. **Caution; when doing this please don't stand in front of the pinch valve outlet, wear eye protection and a dust mask as the media will come out under pressure.**

When the air coming from the outlet of the pinch valve is flowing freely, shut off **Valve #2 (Air supply to mixing chamber)** and re-attach the ½" heavy duty hose to the pinch valve outlet, make sure to tighten down the hose clamp. Step on the foot pedal and check for flow from the hose inside the cabinet. When a good flow of air and media is established, re-install the nozzle holder, nozzle and shims onto the cabinet hose.

# Pressure Pot Operating Instructions

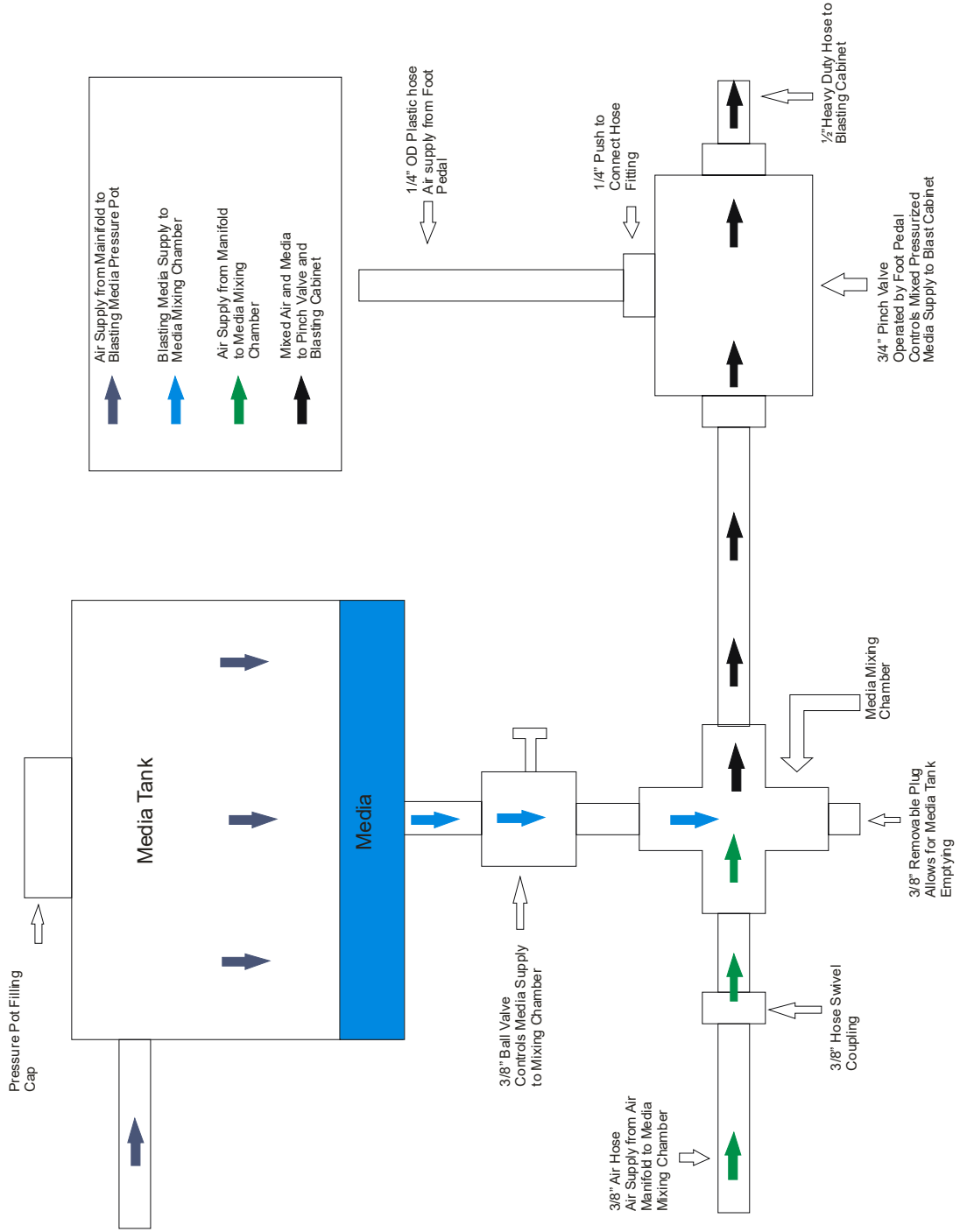
## Pressure Pot Pressure Regulator Manifold





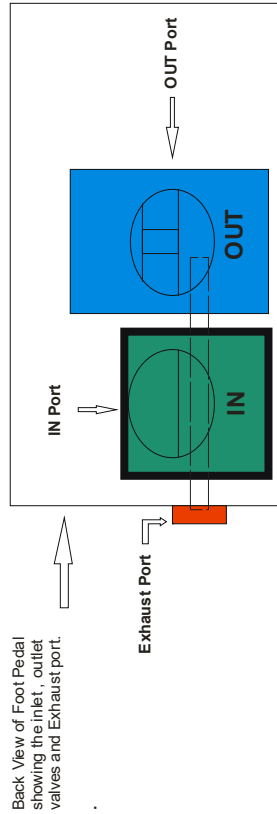
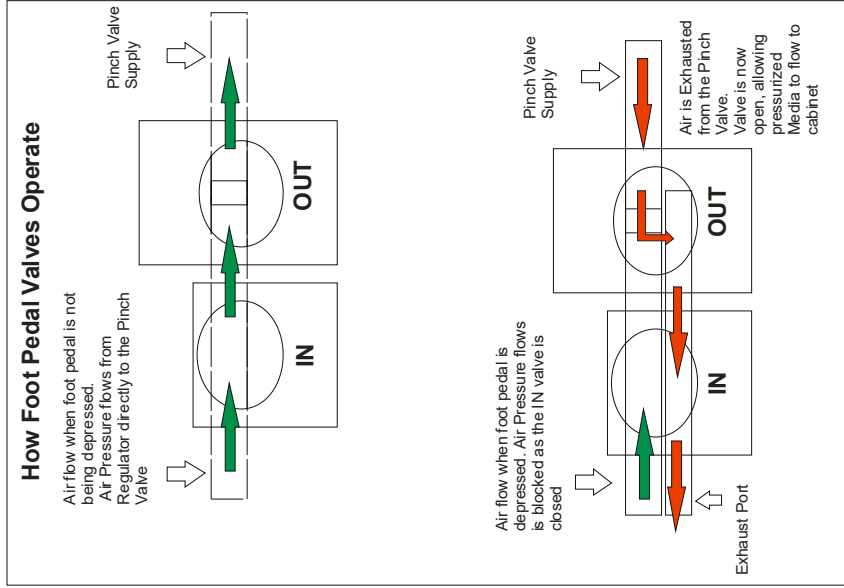
# Pressure Pot Operating Instructions

## Media Supply Valve, Mixing Chamber & Pinch Valve



# Pressure Pot Operating Instructions

## Foot Pedal



The 1/4" Blue Plastic air hose from the 1/4" Air Pressure Regulator fits into the **IN Valve 1/4" Blue Push to Connect Fitting**.

A 1/4" Blue Plastic air hose fits into the **OUT Valve 1/4" Blue Push to Connect Fitting**. This Hose connects to the 1/4" Blue Push to Connect Fitting on the pinch valve.

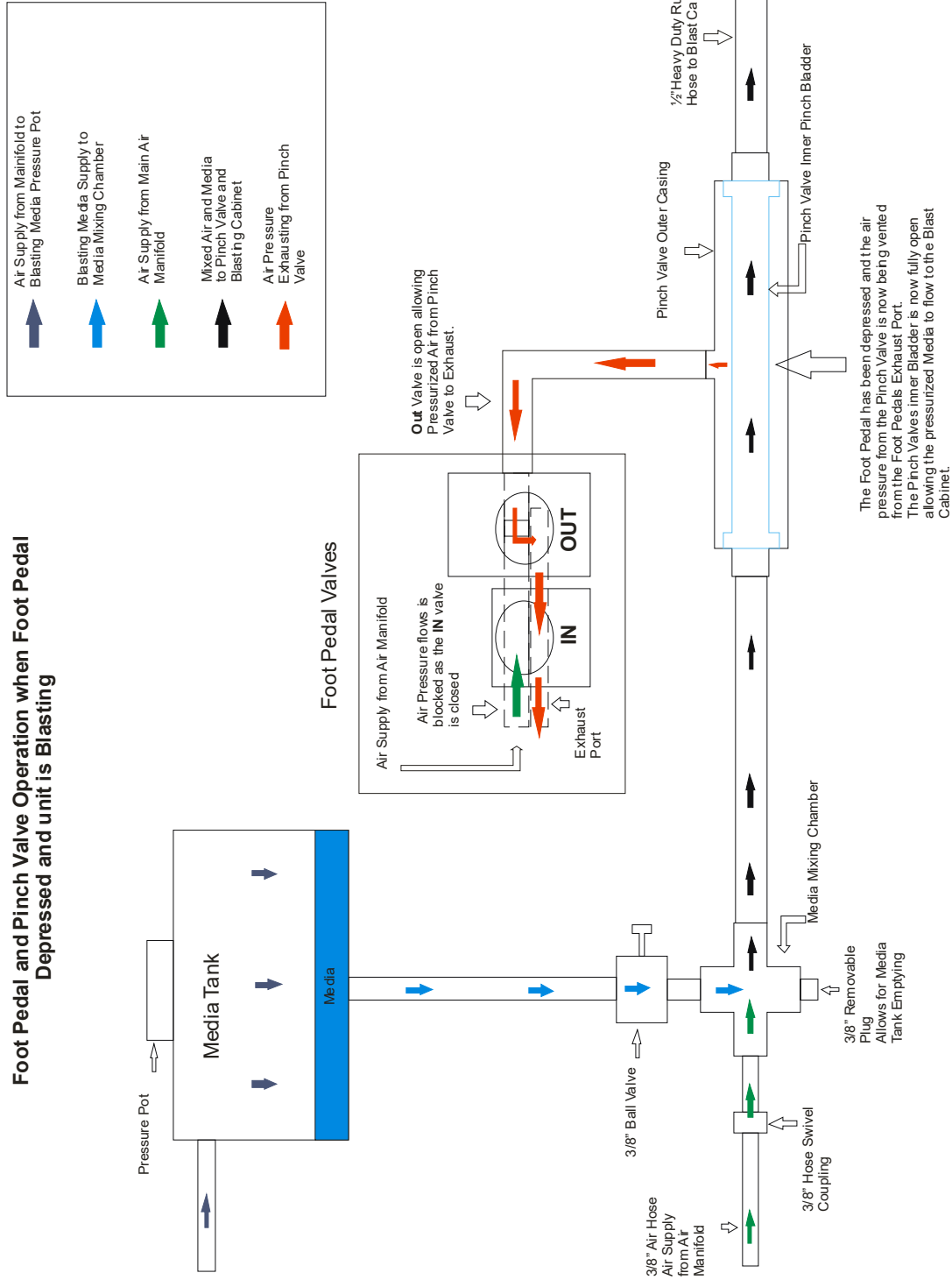
During operation, Pressurized air is fed from the 1/4" Air Regulator to the **IN Valve** of the foot pedal. The foot pedal is a FV320-NO model, the NO means the Valve position is Normally Open. This means air pressure flows into the **IN Valve** port and directly out of the **OUT Valve** port then to the **Pinch Valve** keeping it in the **closed position**.

The **Pinch valve** controls the Mixed Media supply to the Blast Cabinet and until you depress the foot pedal the **Pinch Valve** remains closed.

Once the Foot pedal is depressed the **IN** valve is closed stopping the air supply to the **Pinch Valve**, the **OUT Valve** opens the **Exhaust Port** on the side of Foot Pedal and vents the Air pressure from the **Pinch Valve** allowing it to open and supplying the Blast Cabinet with pressurized Media.

# Pressure Pot Operating Instructions

## Foot Pedal and Pinch Valve Operation when Foot Pedal Depressed and unit is Blasting



# Pressure Pot Operating Instructions

## Foot Pedal and Pinch Valve Operation when Foot Pedal Is Not Depressed and Unit Not Blasting

