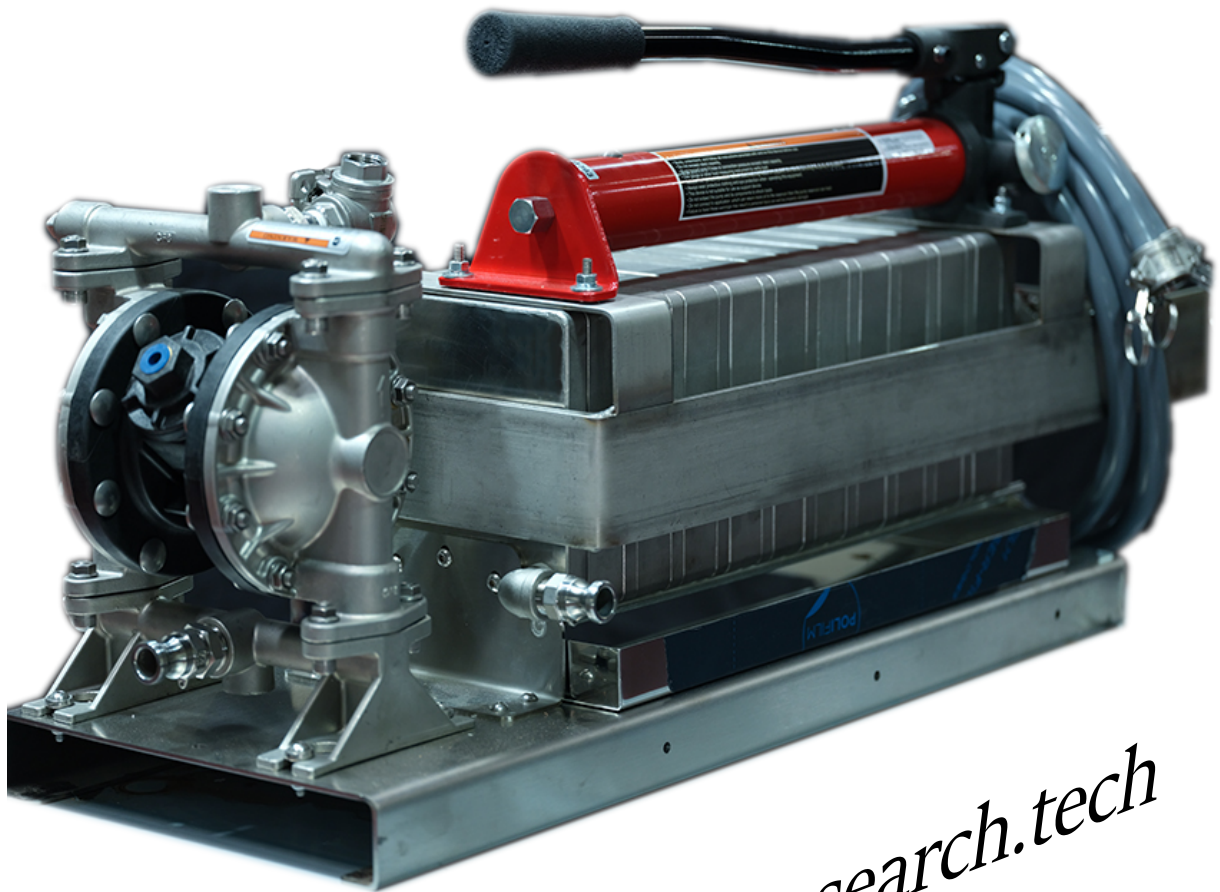




# Summit<sup>®</sup> Research PIG MANUAL



www.  summitresearch.tech

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# What is a PIG Filter?

The PIG [pressurized inert gas] Filter aids in achieving superior clarity in curative oils with the help of specialty filters and proprietary medias. The PIG is a widely used and dependable purification tool which has been relied upon in many industries including beer, pharma and even molasses. These types of filter processes were first invented in the 1800's and still remain a superior technique today.

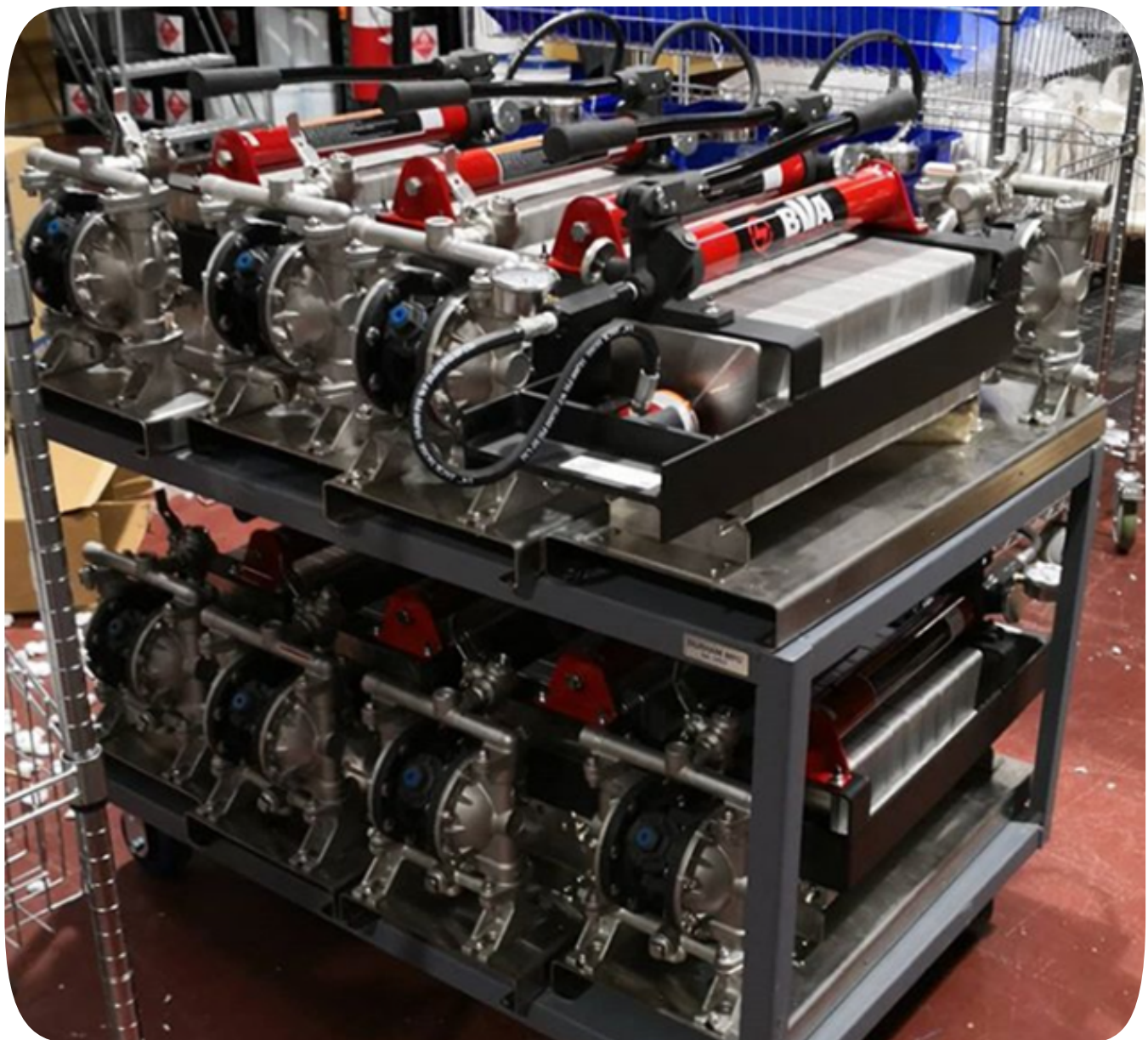
# Understanding Throughput

Throughput all depends on the total amount of media or lipids in the mixture, not the amount of total product. The Summit Research PIG Filter papers will hold a large amount of contaminants while still allowing a fast flow. As contaminants inside the filter increase, the flow will slow, and the pressure will rise. There will be no harm done if there is an excess of particulate in the PIG Filter.

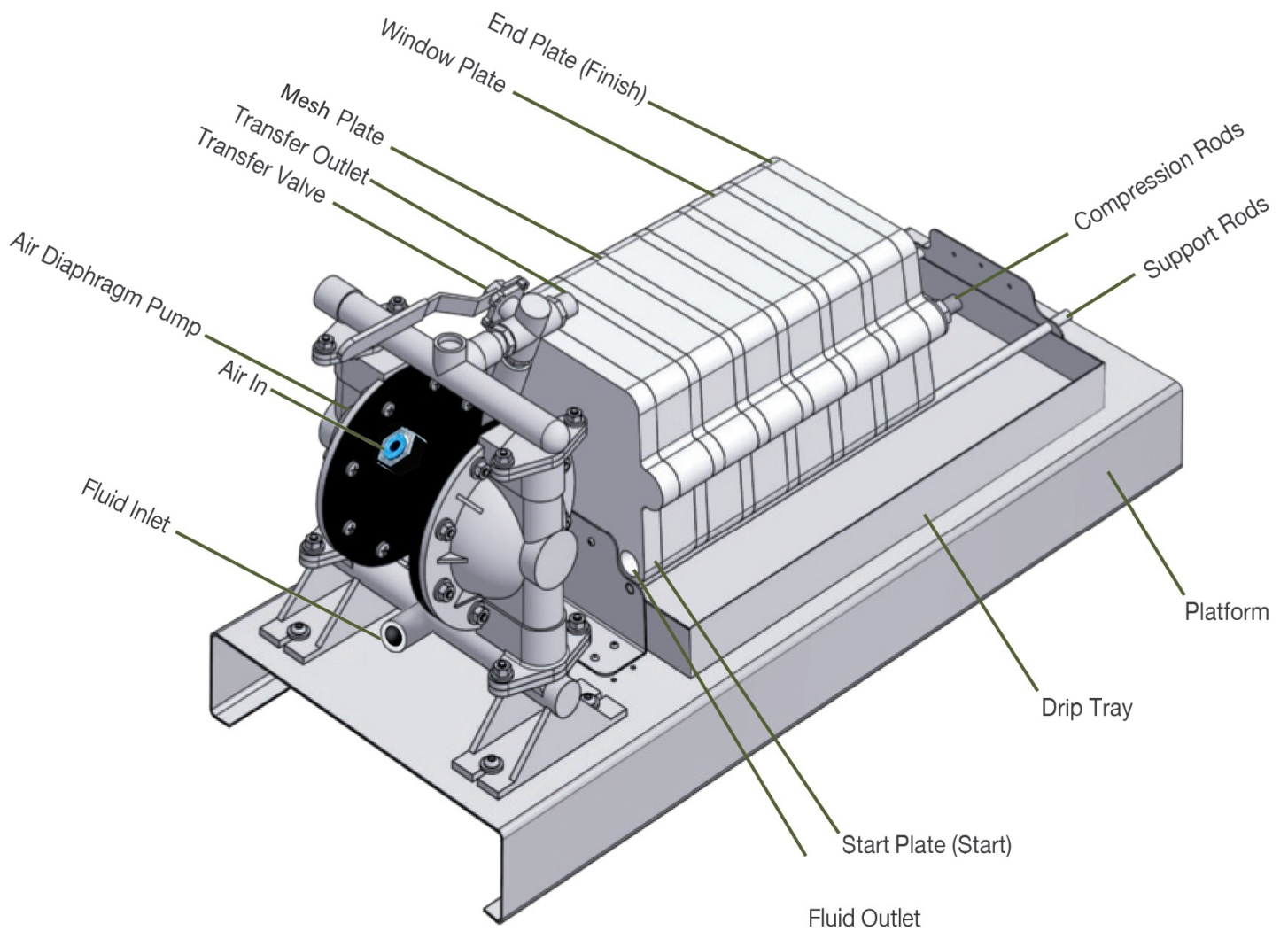
Many variables will determine how much product you can filter before needing to clean out the press. The amount of particulate in the mixture, the temperature, and the amount of filtration media being used.

The hardest variable to determine is how much lipids and waxes are in your product. Products

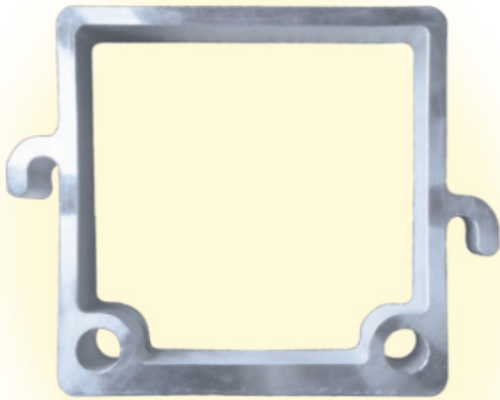
extracted with butane or CO2 contain a larger amount of fats, waxes and particulate than those extracted with alcohol. Through experience you will be able to make adjustments accordingly and this manual will give you a baseline to make those judgements.



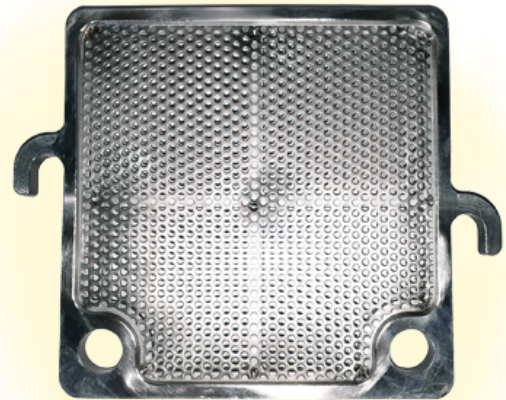
# PIG Anatomy



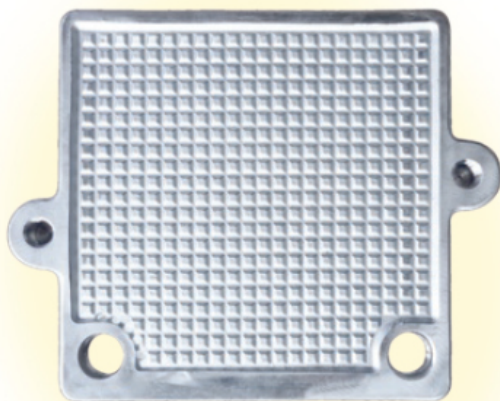
# PIG Filter Parts



Window Plate



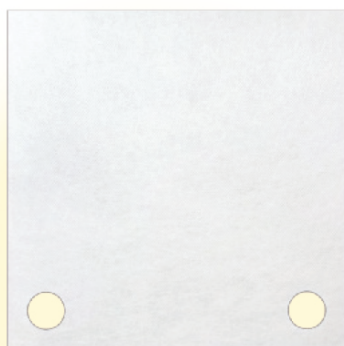
Mesh Plate



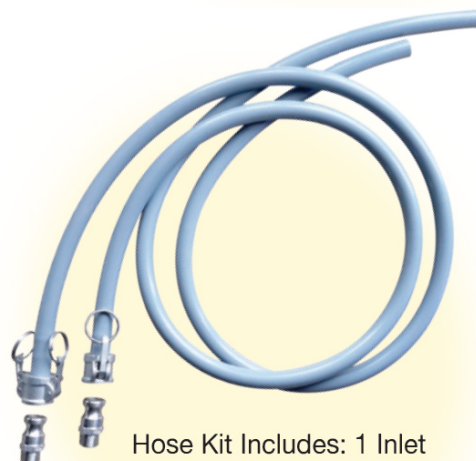
Start Plate



End Plate



7x7.25" Filter Paper  
Included (500 pieces  
of 35 micron)



Hose Kit Includes: 1 Inlet  
Hose, 1 Outlet Hose, and  
2 Cam Lock Fitting Sets

# Safety



Please read entire manual before operating your PIG Filter



Only pick up the PIG Filter from the filter's base/platform. Never try to pull or move the filter by the hoses or hand pump.



Use the PIG Filter for its intended purpose only



Keep hoses away from high traffic, sharp edges, moving parts, ect.



Use a respirator and goggles whenever utilizing media with the PIG Filter.



Make sure your PIG Filter is sitting securely on a strong, sturdy surface. The premium cart that comes with the PIG is optimal. If not using the cart, choose your solid surface wisely.



The PIG Filter uses below freezing liquids. Since your liquids are freezing, the filter will be frozen too, below freezing temps can burn. Wear gloves and goggles at all times!





Check the condition of your hoses and connections before you start filtering. If you need to replace a hose, make sure it is non-collapsing, food grade material. It should be able to withstand positive 120°C to negative -100°C.



Do not exceed 80 PSI on the air compressor. Stop filtering. You will now clean out the plates and insert fresh disposable PIG micron paper. Excessive pressure can cause paper clogage, torn papers or even excessive product seepage between the filter plates.



Make sure the ends of the hoses are secured. Hoses can become detached or slip from your grasps easily.

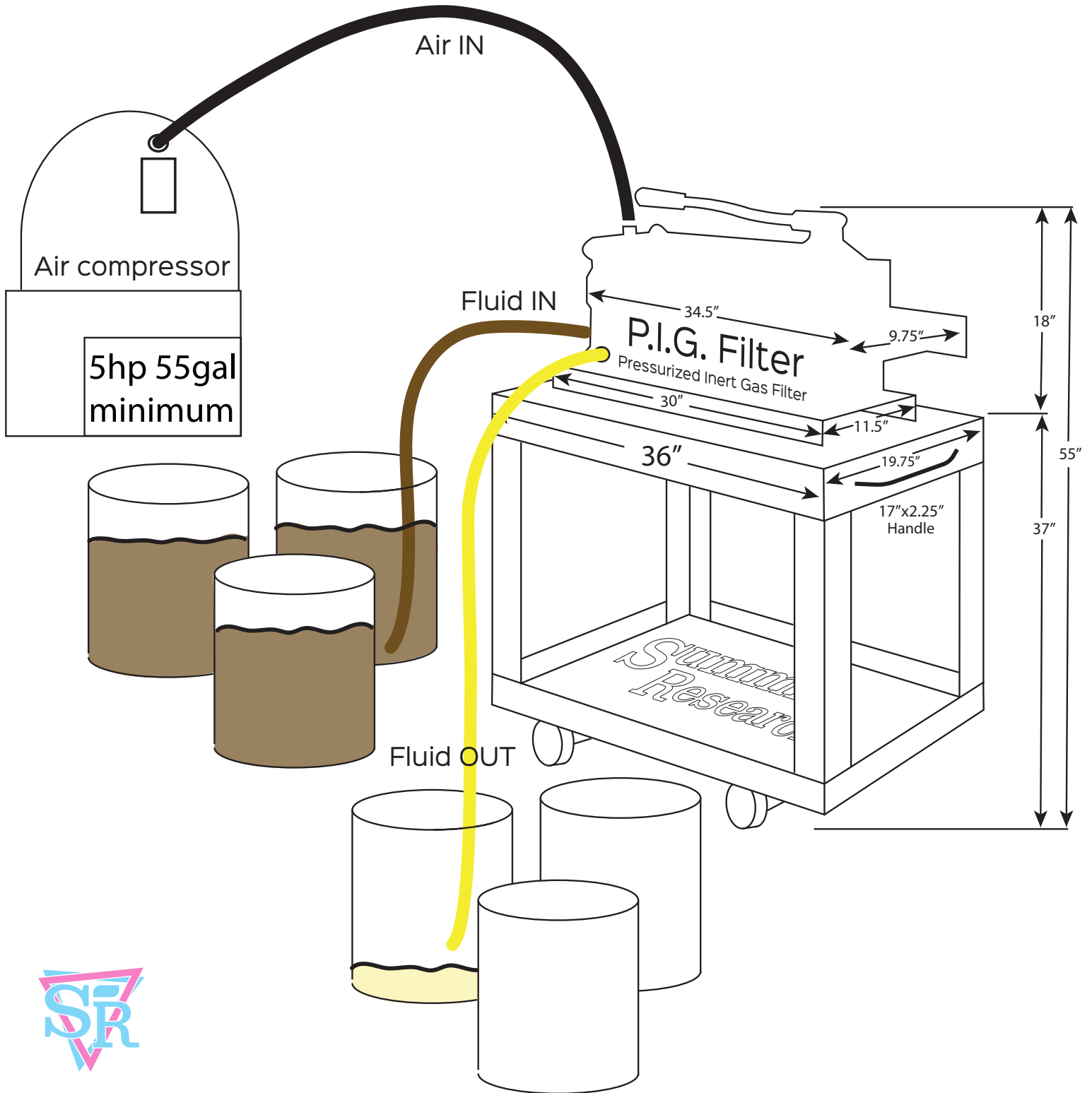


Do not alter or modify the pump or any other components of the PIG.



Keep your work area clean and tidy.

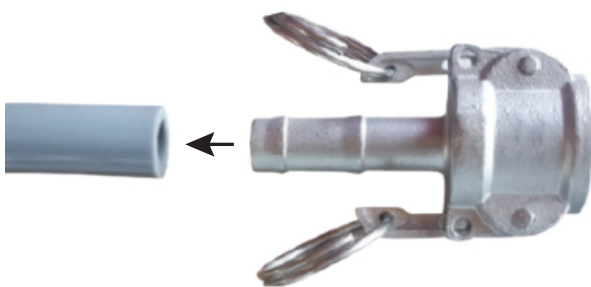
# Sample Set Up



# Steps to using the PIG Filter

**1. Workplace:** If not using the industrial cart, place the PIG Filter on a strong, sturdy, level surface capable of supporting hundreds of pounds. Make sure your PIG Filter is stationary and cannot move.

**2. Hose assembly:** Insert the nipple side of the cam lock into the hose. Summit recommends a 7/8 inch or 1 inch hose clamp to secure the connection since the hose will hold pressure.



The PIG Filter utilizes a 90° elbow between the fluid OUT and the cam



lock fitting. Use plumber's tape on these threaded connections to prevent thread binding and to produce an airtight seal. This process will also need to be repeated for the fluid IN cam lock fitting.

**3. Filter plates:** If tight, use a wrench to loosen the 1/2" threaded nuts on the end of the PIG Filter's compression rods to create space between the plates. REMINDER: The start plate should never be removed.

Begin hanging plates [between start and end plates] starting with a window plate and alternating with mesh plates until the rack is full [ending with window plate].

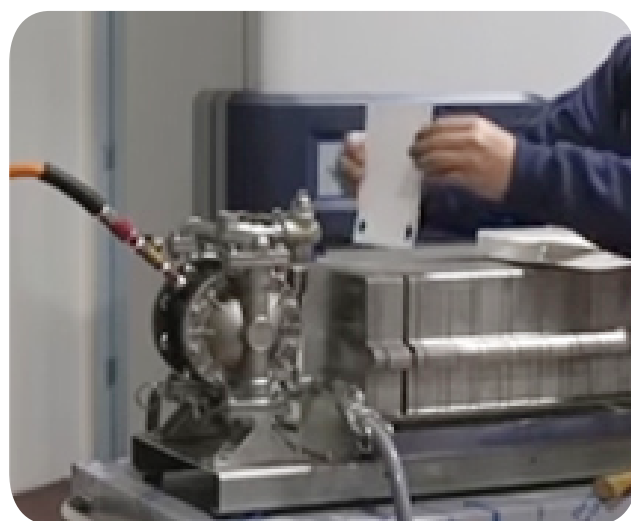


mesh  
plate



window  
plate

**4. Paper installation:** Slip a single new filter paper on both sides of every window plate. The PIG has 10 window plates requiring 20 total pieces of filter paper to fill. Based on what you're filtering, Summit Research has 4 different micron variations of filter paper to choose from.



[The included standard paper is 35 $\mu$ , stage 1 is 20 $\mu$ , stage 2 is 8 $\mu$  and finally stage 3 is sub 1 $\mu$ .]

**5. Tightening the plates :** Finger tighten both nuts. Use your wrench and turn each a quarter turn and alternate until tight. Do not overtighten, the RAM Press will do that for you. Do not apply any sealants or teflon tapes to the threads.

**6. RAM hydrolic hand pump:** Once the plates are tightened with the bolts, place the RAM onto the PIG Filter and tighten down to 4,000 PSI. As you are running the PIG, if you start to notice excessive leaking, tighten the RAM more. **Do not exceed 6,000 PSI.** Do not forget to slide your stainless steel drip tray underneath the filter plates.

**7. Priming the pump:** To prime the PIG air diaphragm pump, you simply need to raise the inlet hose above the pump. Pour 1000ml of clean ethyl alcohol into the intake hose and then open the compressor lines to initiate the pump.

**8. Media inclusion:** This step is for building up a layer of Silica Pulver on the filter papers inside the press.

First, separate off about 3 gallons of the clean alcohol into a separate container. Mix in your Silica Pulver to create a slurry. You will use about 1 cup of Silica Pulver for every window plate [standard Summit PIGs have 10]. Secure the free end of your PIG's fluid OUT inside your barrel and secure the free end of your PIG's fluid IN hose and submerge it in the slurry mixture.

Next, make sure your transfer valve is in the correct position and start your air compressor. You will only need about 15-20 psi to start out. Continue to mix your bucket of Silica Pulver & alcohol while you pump the entire slurry into the press.

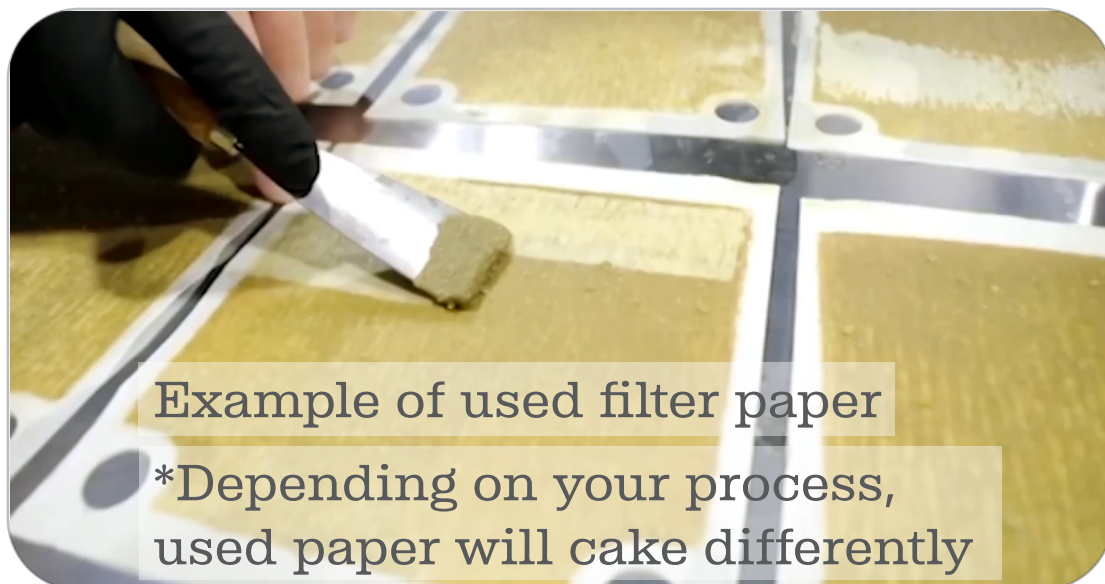
## Why should I recirculate?

- This process will cool down the PIG Filter which is important if you are doing a cold/cryo filtration.
- Recirculating gives you the opportunity to verify that everything is working perfectly and all the plates are chilled before you filter the crude oil.
- Recirculating flushes particles out of the press which may not have been properly rinsed out last time you cleaned it.

## 8. Continue filtering until one of the following happens:

- You run out of fluid to filter.
- Pressure inside the PIG Filter gets too high.  
[ 80 PSI ]

At this point, your session is over unless you were to change out the filter paper and repeat coating processes or run more fluid.



**9. Flushing your fats:** As the last bit of fluid enters your PIG, chase it with a couple gallons of clean, cold alcohol. Don't use so much alcohol that it changes the density of your finished oil. You simply want to push out the remainder of the curatives from your press to maximize yield. Once you are done filtering you will then, clean the press immediately after use.

### **Continued learning...**

Take note of your ending PSI and also the amount of particulate that is captured in each window plate. If you ended with a PSI under 80 and/or your window plates are not filled with particulate, this means your PIG had the potential to filter more fluid this session. Making these observations will help you understand how long filtering will take you and will also help you gauge/estimate how many gallons of oil you can plan on filtering per session in the future. Remember, BHO & CO2 will fill/clog the press faster than crude extracted with ethyl which contains fewer impurities like fats and lipids, for example.

# Cleaning your PIG

**1.** First depressurize the RAM, then with gloved hands, loosen the nuts on the compression rods so that you can remove both the mesh plates and the window plates. The start plate should always remain on the compression rods and be washed in place.

**2.** Discard the disposable filter papers, as well as the fats/media cakes inside the plates. Wash each plate with alcohol. Use a small plastic brush to loosen/remove debris from crevices.

**3.** Run clean warm alcohol through your hoses and pump to flush out all leftover oil and debris.

**4.** For best storage, reassemble and cover the press to keep contaminants off of it while it is not in use.



# Maintenance

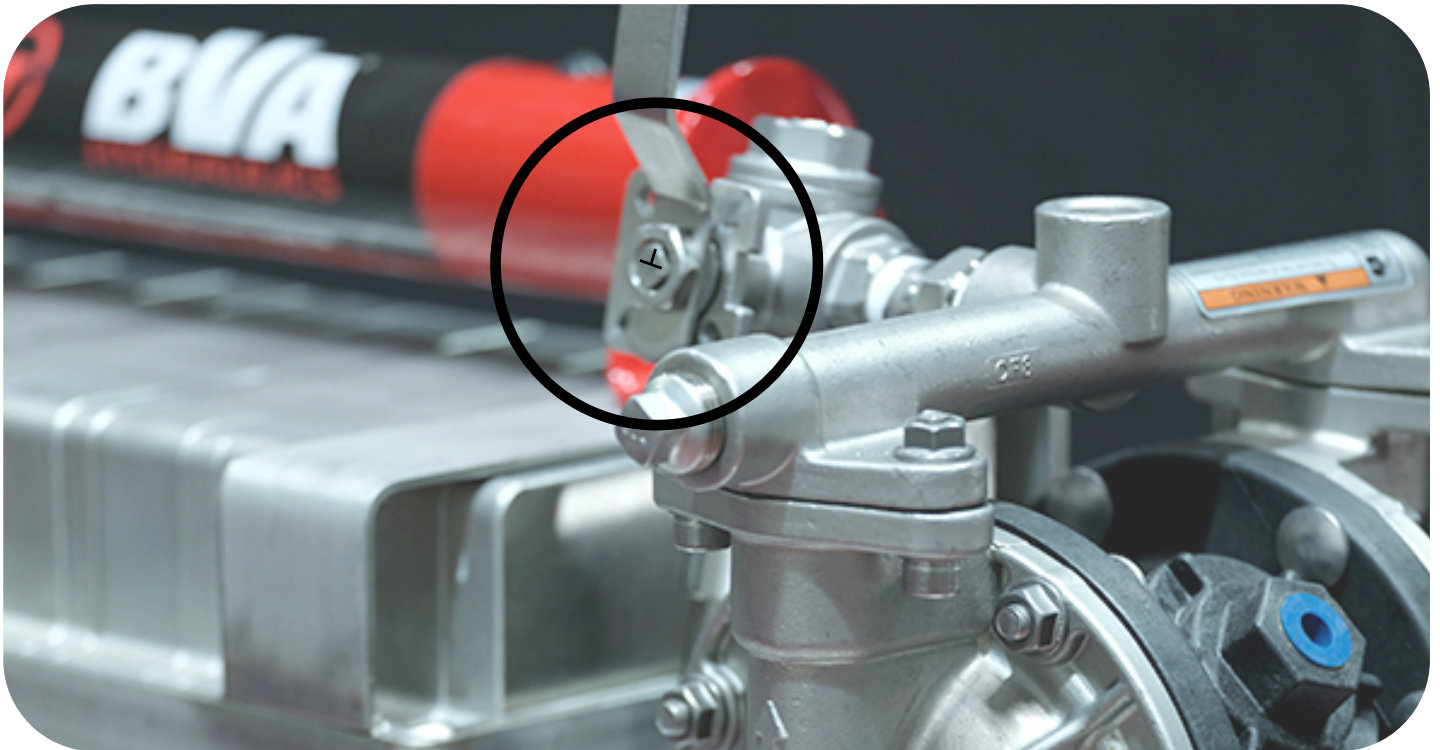


Lubricate the threads of the PIG Filter's compression rods to prevent galling. We recommend Jet-Lube White Knight Food-Grade Anti-Seize. Whichever lubricant you choose, follow the manufacturer's recommendation for frequency of application.



For air diaphragm pumps, add a couple drops of Air Tool Oil in the air inlet port after every 5 hours of operation.

# Utilizing the PIG air diaphragm pump as a fluid transfer pump



All PIG Filter Presses come with a T-Valve. This added valve allows you to redirect the path of the liquid so that it doesn't go through the filter plates. This feature is used to pump fluid from one place to another.

The handle has four positions if you elect to use it to move liquid and bypass the filtering. There are other directions you can take it as well, the T-Valve has the flow marked on its center hex.

# Frequently Asked Questions

## What is a bypass valve? Do I need one?

Many of our competitors use brass gear pumps, also known as “positive displacement” pumps. These pumps are less forgiving and can build up dangerous pressure which needs to be relieved by a bypass valve for safe operation.

In contrast, the PIG air diaphragm pump offers ultimate control of pressures and pump speeds and does not require a bypass valve to relieve pressure. Summit Research offers a stainless steel air diaphragm pump which is guaranteed to have a longer lifespan, they are easier to use, and are manufactured using superior food grade materials.

The PIG filter presses have a T-valve which allows you to transfer liquids from one place to another without filtering. This is also sometimes referred to as a “bypass”, and is handy for transferring fluid from one place to another.

## **What kind of air compressor is compatible with the PIG filter diaphragm pump?**

It is recommended to use a 5-6HP screw type compressor, but the bare minimum would be a 5-6HP Harbor Freight special compressor with a 55 gallon tank. You will need an adapter for your air compressor to connect to the 1/4" NPT. Also, your air compressor should have a regulator on it so you can monitor and adjust pressure in the pump.

## **What is the minimum amount of fluid that can be filtered each session?**

This will vary depending on what type of extraction was done. On average you will see about 50-60 gallons of BHO or CO2 extract and up to 300 gallons of alcohol extract.

## **Should I add a pressure gauge onto my PIG?**

No. When using an air diaphragm pump, your air compressor's pressure gauge will tell you how much pressure is being exerted inside the press. The RAM hydrolic hand pump has its own gauge to regulate the pressure being put onto the plates but, do not exceed 6,000 PSI.

## **What are the min and max pressures for the diaphragm pump?**

When you first start out, very little pressure [15-20 PSI] is required to create flow. As the filters begin to fill with particulate, the pressure will rise. Do not exceed 80 PSI.

## **Should the fluid going to the press use a gravity feed?**

Gravity feed is not necessary. The air diaphragm pump can lift the fluid from 6-8 feet below if necessary.

## **Is it normal for Fluid to leak out between the filter plates?**

Yes, some leakage is normal. Your drip tray will catch this. You can then add the fluid from your drip tray back into your 'fluid to be filtered' bucket for your next filtering session.

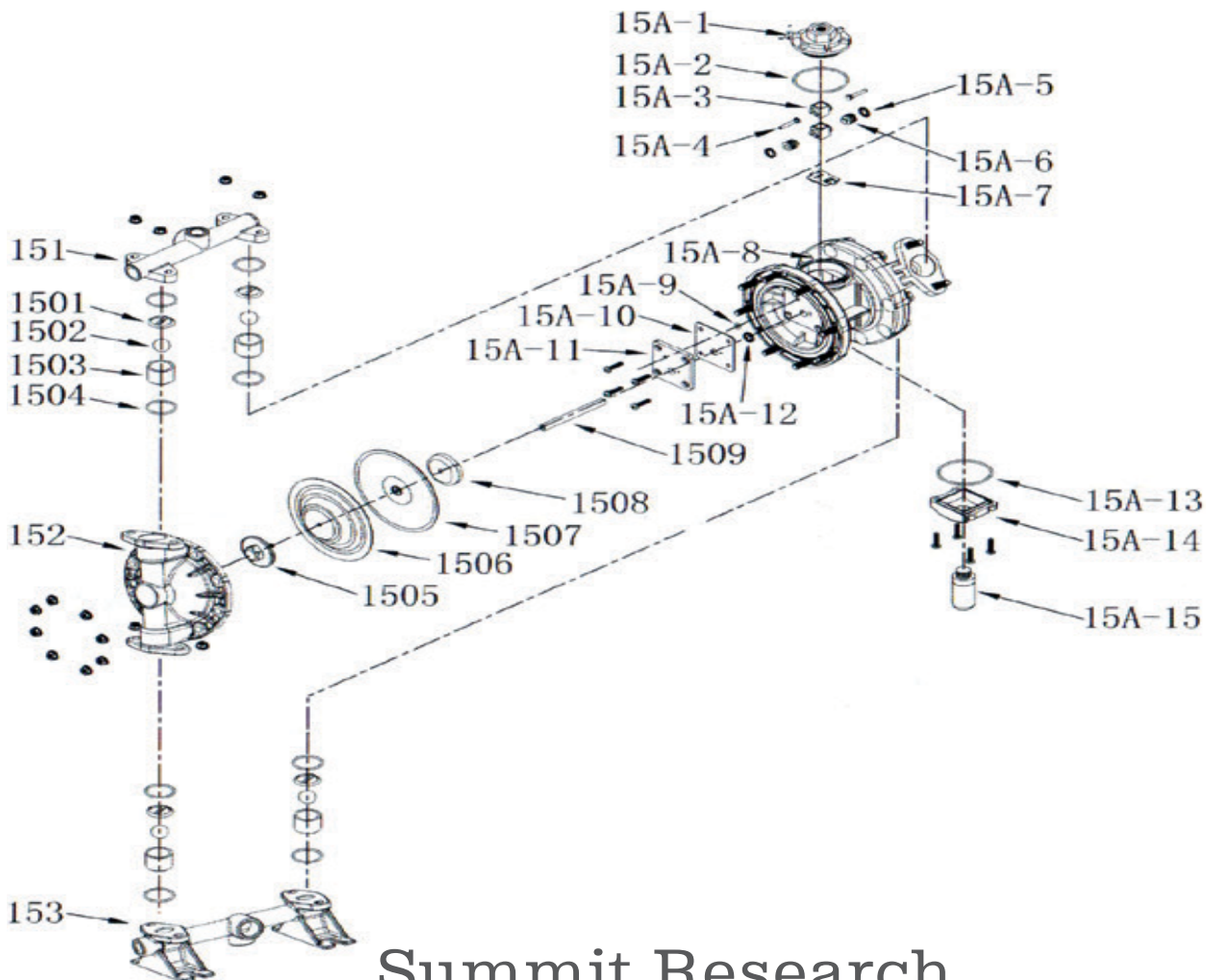
## **I will continue to filter tomorrow, do I still need to clean the PIG Filter today?**

Yes, clean the PIG immediately after each session. Do not wait.

# PIG Filter Features

- Indisputably food grade
- Extremely durable, strong and robust structure
- This pump is rated for up to 120psi.  
(You should not exceed 65 psi in this application.)
- Maximum temperature is 120°C. Minimum temperature is -100°C.
- Does NOT require a bypass valve
- Worry-free idling capability  
(Competitors' positive displacement pumps are damaged by idling.)
- Simple operation
- Easy disassembly for repairs

## Pump Anatomy



## Fluid Section Parts List

Number	Parts Name	Qty
151	Outlet Manifold	1
152	Fluid Cover	2
153	Inlet Manifold	1
153-1	Footing	2
1501	Baffle Booth	4
1502	Valve Ball	4
1503	Valve Seat	4
1504	Seat O-ring	8
1505	Plate	2
1506	Teflon Diaphragm	2
1507	Rubber Diaphragm	2
1508	Inner Plate	2
1509	Central Rod	1

## Air Motor Parts List

Number	Parts Name	Qty
15A-1	Valve Chamber Cover	1
15A-2	Valve Chamber Cover O-ring	1
15A-3	Commutation Switch	2
15A-4	Commutation Pin	2
15A-5	Piston V-ring	2
15A-6	Piston	2
15A-7	SST Air Valve Plate	1
15A-8	Air Valve Body	1
15A-9	Commutation Pin O-ring	2
15A-10	Air Valve Plate	2
15A-11	Air Valve Plate Gasket	2
15A-12	Central Rod V-ring	2
15A-13	Muffler Base O-ring	1
15A-14	Muffler Base	1
15A-15	Muffler	1

# Troubleshooting Guide

Symptom	Cause	Solution
Pump is running but nothing is coming out	Issue with the ball in the pump's check valve	Contact Summit Research for replacement part
Pump does not have suction	Air compressor is not attached properly	Reconnect
	T-Valve is not in the correct position.	Turn valve handle to the proper position. Further explanation: <a href="https://tinyurl.com/slmp-t-valve">tinyurl.com/slmp-t-valve</a>
Pump does not cycle or stops after one cycle	Air valve is stuck or dirty	Clean the Air Valve
	Valve ball is severely worn and is wedged in its seat or manifold	Contact Summit Research for replacement ball and seat
Lots of air bubbles in the solution	Mouth of the input hose is not fully immersed in solution or the hose is clogged.	Clean hose and make sure the mouth of the hose is fully in the solution
	Diaphragm is ruptured	Contact Summit Research for replacement part
	Loose inlet manifold, damaged seal between manifold and seat or damaged o-ring.	Tighten or contact Summit Research for replacement part
Pump operates erratically	Suction line is clogged	Inspect and clear
	Sticky or leaking check valve balls	Clean or replace
	Restricted exhaust	Remove restriction
	Diaphragm is ruptured	Contact Summit Research for replacement part