



**PACKAGING
MACHINES
AUSTRALIA**



ICP-1 USER MANUAL

Volumetric Filling Machine with variable cylinder assembly
(Sizes – 50ml, 125ml, 250ml, 500ml, 750ml, 1250ml, 2000ml)

March 2022



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1 INTRODUCTION

The ICP-1 filler - This high-quality, heavy-duty machine was built and designed in Australia by ICP Packaging Machines Australia.

The ICP-1 incorporates one volumetric filling cylinder with a rotary or spool valve.

Purpose-built for either benchtop operation, it's portable and easily transferrable between areas.

The ICP-1 includes a rotary valve set up that allows filling of products up to 60°C (and a spool valve for products at higher temperatures), adjustable nozzle heads of multiple sizes to suit customer requirements and can be set up with hopper or direct inlet connection.

WARNING

BEFORE USING THE MACHINE IN PRODUCTION IT IS ESSENTIAL THAT ALL WETTED PARTS BE CLEANED BY THE CUSTOMER TO THEIR SPECIFICATIONS. WETTED PARTS MAY CONTAIN PARTICLES LEFT OVER FROM THE MANUFACTURING PROCESS.

2 SAFETY

ICP Packaging machines are custom-built machines designed specifically for an application and/or purpose outlined by the customer and the requirements to fulfil a project.

This machinery is built with safety measures to protect the machine from damage and limit the risk of injury to the user. However, it is imperative that any user who intends to operate this equipment have a sound understanding of pneumatic based equipment, has thoroughly read this manual, and is confident in the safe continual operation of the equipment.

It is also recommended that the company or persons in possession of this equipment do their own risk assessment and install any guarding measures they deem necessary for the safety of the operators and the environment to which the equipment will be used.

3 CONTROL FUNCTIONS

3.1 OFF/ON SWITCH



ON/OFF is the main switch for starting and stopping the machine and should be used to start and stop the machine under normal operating conditions.

3.2 ADJUST/RUN SWITCH



RUN position is used for the standard operation of the filler to run the cycle.

ADJUST position, when selected, will allow the user to adjust the fill volume of the cylinders. In this position, the main pneumatic cylinder and the product cylinders stop in the fully forward position, taking the pressure off the adjuster plate inside the machine and enabling adjustment to be made via the Volume Adjusting Handwheel.

3.3 EMERGENCY STOP BUTTON (E-STOP)



E-STOP When this button is depressed, the air is "dumped" from the Main Cylinder, the Product Valves return to their "inlet" positions, and the machine stops. This button is released by turning the knob CLOCKWISE.

NOTE: When resetting the **E-STOP**, ensure to put the machine in **OFF** first

3.4 FILL

FILL dial adjustment will control the pneumatic cylinder speed that pushes the product out the nozzle on the filling cycle. Adjusting the dial clockwise will slow down the fill, anticlockwise will increase the filling speed.

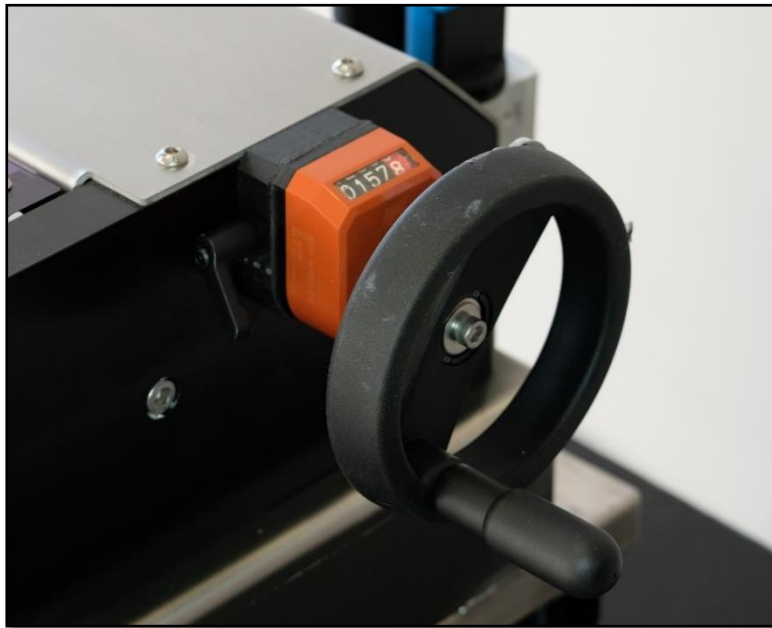
Adjust fill speed to suit the product you are filling. Running too fast can result in the splashing of the product. It's best to start slow and increase the speed to a point where you get a smooth, even flow.

3.5 RECHARGE

RECHARGE dial controls the speed at which the product is sucked in from the source (Hopper or inlet connection).

Adjust to suit the viscosity of the product you are filling. Running too fast can result in air bubbles in the system and/or strain on the machine. Start slow and build up to a speed that is comfortable for the machine.

3.6 HANDWHEEL AND DIGITAL SCALE



The handwheel at the side of the machine controls the fill volume, and the digital scale gives you the ability to fine-tune the fill volume easily, and to be able to return to a noted volume without having to re-calibrate the fill volume.

The Dial indicator (digital scale) is millimetre accurate to the stroke length of the air-cylinder. The air-cylinder stroke length is 160mm max. Therefore, the maximum scale possible on the machine is 160.

Ensure to lock off the handle once adjusted to limit any possible movement whilst the machine is in operation.

NOTE: only needs to be lightly nipped up “do not overtighten”.

NOTE: the red digit is a 10th of a mm. I.e. Setting the scale to 32 = **320**

4 SETUP PROCEDURE

4.1 ASSEMBLY

The ICP-1 can be set up with multiple differing options (E.G. different cylinder sizes, hopper or inlet feed, and numerous nozzle options to suit your project).

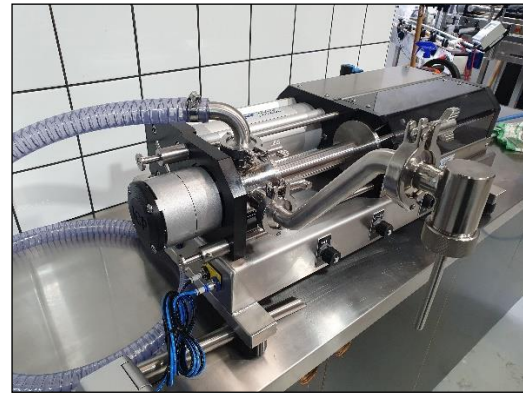
4.1.1 HOPPER

Hopper choice will vary depending on the setup for your machine, from small to extra-large. If using a hopper, position the hopper's tri-clover flange onto the seal, position the tri-clover clamp to enclose the mating inlet port and hopper flanges, then tighten the clamp finger-tight.

4.1.2 INLET CONNECTION

An inlet connection can be installed to the top of the valve to feed in the product via a hose. To do this, fit the product hose over the plain end of the curved inlet fitting and secure it with a hose clamp (*Warm the hose in hot water to make this easier*). Then connect the flanged end of the curved inlet fitting to the inlet port.

Note: Ensure that any valves/taps supplying the product are open, and that the hose is not bent or kinked.



4.1.3 INSTALLING/CHANGING NOZZLES

ICP fillers are available with an extensive range of nozzles to suit a range of applications. These include;

- Standard Nozzles 6mm – 22mm
- Positive Shut Off (PSO) 12mm – 25mm inward or outward opening nozzle
- Plug Nozzle
- Suck-back Nozzle 6mm – 22mm

Connect the nozzle gooseneck fitting by placing a rubber tri-clover seal ring onto the outlet port flange on the front of the product valve body, then place the mating flange of the nozzle gooseneck fitting over the seal. Position a tri-clover clamp to enclose the flanges and tighten the clamp finger tight.



Ensure gooseneck plug is installed and finger tight – this is removable for cleaning purposes.

Install product nozzle to the outlet end of the gooseneck fitting according to the type of nozzle supplied (either screw-in type, push-in type or tri-clover flange type).

If the machine has been supplied with a suck-back nozzle, fit the gooseneck plug to the underside of the gooseneck head (where the standard liquid nozzle would normally be fitted). Then fit the gooseneck to suck-back nozzle adaptor and tighten enough to ensure an air-tight seal on the O-ring. Attach the suck-back nozzle to the adaptor with the tri-clover clamp and seal supplied. Connect the black and blue airlines from the nozzle to their respective bulkhead fittings, located below the airlines for the rotary actuator, in the centre of the lefthand side of the machine.



Close nozzle the suck-back adjustment knob – refer to section 4.3 on page 10 rotary valve model only). Provide a suitable container or flushing tray under the filling nozzle, or slip a hose over the nozzle and into a container at floor level.

Move ON/OFF switch to ON. (The ADJUST/RUN switch should remain in RUN position).

If the machine has been configured for SEMI-AUTOMATIC (footswitch) operation, leave the ON/OFF switch OFF, depressing the footswitch will cause the machine to cycle once, with the product piston finishing in the right hand (fully recharged) position.

As the machine continues to cycle, (either automatically or by repeatedly depressing the footswitch) product will be drawn through the system and will eventually be discharged from the nozzle.

To stop at any time, simply move the ON/OFF switch to OFF or cease depressing the footswitch.

Continue flushing until solid product is being discharged from the nozzle without entrained air.

Move ON/OFF switch to OFF.

Remove flushing container or hose.

4.2 CONNECTION OF COMPRESSED AIR SUPPLY

Ensure that the Control Panel switches are in the following positions:

ON/OFF switch - **OFF**

ADJUST/RUN switch - **RUN**

EMERGENCY STOP switch – **RELEASED**



WARNING: ENSURE THAT ALL INLET AND OUTLET PORTS FROM THE MACHINE ARE COVERED, OR HOPPER AND/OR INLET CONNECTIONS ARE ATTACHED BEFORE CONNECTING AIR TO THE MACHINE.

IMPORTANT THAT NO OBJECTS ARE INSERTED INTO THE VALVE PORTS AT ANY TIME. DOING SO CAN RESULT IN SEVERE DAMAGE TO THE MACHINE AND OR SERIOUS PERSONAL INJURY.



Connect the main compressed air supply line via a NITO or similar connection fitting on the Air Pressure Regulator/Filter. Located on the rear corner of the machine. Ensure that the Hand Valve is turned to EXH (off position).

Adjust air pressure to 600 kPa (87 psi) via the knob on the Filter/Regulator Unit.

The ICP-1 requires a constant 87psi to the machine. It is also recommended that the air supply has a dryer installed.



OFF



ON



NOTE: The machine's design doesn't require oil lubrication to the pneumatic components.

!!! ENSURE NO INLINE OILERS ARE FITTED!!!

4.3 SAFETY INTERLOCK

Opening the polycarbonate guard or depressing the emergency stop button will cause air to be dumped from the main air cylinder and render the filler inoperative.

To reinstate air to the filler, first turn the ON/OFF switch to OFF. Close the guard or release the emergency stop button (refer to section 1.3).

This will allow the soft start-up valve to activate and slowly bleed air into the machine. Wait approximately five seconds for full air pressure to be reinstated. To continue filling, turn ON/OFF to ON.

4.4 EMERGENCY SAFETY STOP SYSTEM

ICP Filling machines are fitted with acrylic safety guards/covers to the filler, and an Emergency safety stop switch on the main control panel. If guards are in the open position or the stop button is in the pressed position, the machine's emergency stop system will be activated. This will cause air to be dumped from the main air cylinder and render the filler inoperative.

FIRST, turn the ON/OFF switch to **OFF** to reinstate air to the filler. Then, close the guard or release the Emergency Stop Button.

This will allow the Soft Start-Up Valve to activate and slowly bleed air into the machine. Wait approximately five (10) seconds for full air pressure to be reinstated. To continue filling, turn ON/OFF switch to **ON**.

5 PREPARING MACHINE FOR FILLING

5.1 Before you run your product in the machine

When you first receive the machine, it is recommended to set up the machine with a storage container or drum (hopper) with water before connecting or running your product through the machine. This will allow the user to familiarise themselves with the machine, set up the controls, determine the fill volume and flow rates, and fine-tune the nozzles before putting expensive products in the machine.

5.2 Connecting Product Supply

Connect the source supply of the product to the machine via a hopper or inlet connection. Ensure to install supplied Teflon or EPDM seals between the tri-clover connections and the hopper or inlet connection.

The ICP-1 is capable of sucking the product directly from a source as long as the product is not too thick and the source is not too far from the filler. The best

practice is to ensure a natural flow from the source. This can be achieved by connecting to the bottom of the source vat or raising the VAT, IBC etc... so there is a natural flow to the machine. It will also allow the machine to recharge quicker and more accurately as there will be no tension in the line.

5.3 Fill Volume Adjustment

The handwheel at the back of the machine controls the fill volume.

To Adjust, turn the machine into the **ADJUST** and **RUN** modes on the front control panel. This will bring the main plate in the machine forward to the end of the fill stroke and allow the volume adjustment.

NOTE: Adjusting without first putting the machine into the ADJ mode will mean the main plate will be against the adjuster plate. This will result in added pressure when attempting to reduce the volume and could damage the machine's internal workings.

Dial indicator (digital scale) is millimetre accurate to the stroke length of the cylinder. The cylinder stroke length is 160mm max. Therefore, the maximum scale possible on the machine is 160.

To calculate the volume required for your fill, divide the cylinder size by the stroke length (160mm) of the air cylinder, then multiply by your required volume.

i.e. (if using a 500ml cylinder) divide $160/500\text{ml} = 0.32$, then multiply by your volume $100\text{ml} (0.32 \times 100) = 32.0$. The starting point on the digital scale would be 32, and you would fine-tune it from there.



Ensure to lock off the handle once adjusted to limit any possible movement whilst the machine is in operation.

NOTE: only needs to be lightly nipped up, "do not overtighten".

NOTE: the red digit is a 10th of a mm. Setting the scale to 32 = **320**

To check the new Fill Volume, move the ADJUST/RUN switch to **RUN**, and the machine will recharge. Repeat the above procedure to dispense a single fill into empty containers to check the fill volume.

Final volume check should be done from containers selected during continuous cycling since product dispensed in the cycle immediately after the machine has been idle and/or adjusted may vary slightly to that subsequently dispensed.

6 OPERATING & ADJUSTMENTS

6.1 CONTINUOUS CYCLING

Ensure that Emergency Stop Button is released - ADJUST/RUN switch is in the **RUN** position.

Move ON/OFF switch to **ON**.

If configured for auto-cycling, machine will begin cycling automatically, and can be simply stopped and started by the ON/OFF switch. If fitted with a footswitch, machine will cycle once for each press of the footswitch. In an emergency, depress the red emergency stop button.

6.2 RESTART AFTER AN EMERGENCY STOP

If or when the E-Stop has been activated, it is essential to first move the ON/OFF Switch to **OFF** before releasing the E-Stop

"RECTIFY THE PROBLEM WHICH REQUIRED THE EMERGENCY STOP".

Release the Emergency Stop button by turning the knob (red button). **CLOCKWISE**.

Allow approximately ten seconds for full air to be reinstated before proceeding.

Return the ON/OFF Switch to **ON**.

6.3 FILLING RATE



The rate at which the product enters the container should be adjusted so that the container is filled as quickly as possible without excessive product turbulence and/or foaming. Nozzle diameter, nature of the product, the shape of a container, etc., will influence the maximum rate of filling, and the optimum rate can only be determined by trial and error.

Recommend starting slow and increasing the fill rate to suit the product and container. The aim is to achieve an even flow.

To adjust the fill rate - turn the **FILL** Flow Control Valve Knob on the side of the machine.

Turning the knob **CLOCKWISE** - decreases fill rate speed.

Turning the knob **ANTICLOCKWISE** - increases fill rate speed.

6.4 RECHARGE RATE



The product cylinder recharge rate should be adjusted so that the cylinder is recharged as quickly as possible, but with adequate time for exchanging the filled container under the nozzle with an empty one.

The recharge rate should not be so fast that cavitation (air pockets) occurs in the product pump. In simple terms, cavitation occurs when the piston moves faster than the product can be drawn into the cylinder. This will result in fill volume variations.

To adjust the recharge rate - turn the **RECHARGE** Flow Control Valve Knob on the **FRONT** of the Control Panel.

Turning the knob **CLOCKWISE** - decreases the recharge rate.

Turning the knob **ANTICLOCKWISE** - increases the recharge rate.

6.5 FINE-TUNING

Once the machine is operating continuously, some fine-tuning of adjustments may be necessary to optimise the cycle time and ensure a smooth filling operation.

Fill volume can be fine-tuned if necessary whilst the machine is running by unlocking the back lever and turning the Volume Adjusting Handwheel when the Main Drive Cylinder is forward.



DO NOT ATTEMPT TO ADJUST VOLUME WHEN THE PRODUCT CYLINDER IS FULLY RECHARGED AND THE ADJUSTING MECHANISM IS UNDER LOAD.

7 PREVENTATIVE MAINTENANCE

7.1 GENERAL

Your ICP-1 Filling Machine is designed for minimum maintenance operation. Its design features and construction materials eliminate the necessity for an extensive preventative maintenance routine.

The pneumatic cylinders, valving, and controls DO NOT REQUIRE LUBRICATION. Other moving parts are either self-lubricating or require only an occasional lubricant smear.

The maintenance schedule should be based on how the machine is used, the product, the environment and how often the machine is used. The below is a suggested schedule and should be used as a minimum. If the machine is in high use and/or harsh environments, the maintenance schedule should be altered to suit.

7.2 SEALS

The Teflon/UHMWPE Slipper/Glide Ring Seal fitted to the Product Cylinder Piston at the factory is energised by an O-ring of a material selected for the chemical composition of the product(s) nominated at the time of purchase.

This seal arrangement provides low friction and high chemical resistance characteristics. The piston head is also fitted with separate Ertalylte (PETP) support rings to prevent accidental contact between the piston head and cylinder wall.

The product piston seal is the hardest working seal in the machine as it is subject to the pressure and reciprocating action of the piston and is in constant contact with the product.

Products with chemically aggressive ingredients can shorten seal life dramatically. Whilst there are several types of O-ring materials available for the Piston Seal, Spool Valve Seals, and other secondary seals to provide the best possible life and performance when in contact with various chemicals, more than one type of seal material may be required to cope with different products having different chemical compositions.

Products of a particularly aggressive nature may also require seals of unique materials in other areas of the machine.

If any doubt exists as to the compatibility of the seal material and the products being used, the seals should be inspected regularly. Regardless of the product used, the product piston seal should be inspected weekly.

Please consult RENTAFILL if the seals show signs of cracking, swelling, premature failure or other signs of degradation, as you may require seals that are more compatible with your product.

Failure to replace seals and continue using the machine can damage the cylinder walls and piston components.

7.3 DAILY MAINTENANCE

Drain the Air Filter Bowl of accumulated dirt and water by loosening the plastic screw at the base of the clear plastic bowl. Re-tighten by hand.

Clean product cylinder and rotary valve. This will be product-dependent as most food and cosmetic products will require cleaning the wetted components between batches and at the end of the product run. Other products may only require a flush.

Inspect wetted parts for product leaking. If found, please inspect seals within these wetted parts.

7.4 WEEKLY MAINTENANCE

Regular daily maintenance plus;

Check the Product Piston Seal and Valve Seals by dismantling the wetted parts. Add a smear of light oil to the product piston rod.

7.5 3 MONTHLY MAINTENANCE

Regular daily maintenance plus;

7.5.1 Filling Machine

Remove the top cover and apply a smear of grease to Volume Adjusting Threaded Shaft.

Inspect and apply a smear of light oil to the product piston rod and bearing rods.

8 DISMANTLING PRODUCT VALVE AND CYLINDER ASSEMBLY

It is recommended that the wetted parts of the machine be removed and inspected/cleaned between batches and/or at the end of the production run.

Before dismantling the Product Valve and Cylinder Assembly for thorough cleaning or inspection, the machine should be purged of residual product, preferably flushed with water or an appropriate solvent.

8.1 FLUSH CLEANING

Remove the Product Supply Hose from the product supply container, or if a hopper is fitted, scoop out as much product from the hopper as possible.

Flush the remaining product out of the machine as described in flushing/purging machine process (5.5).

When product ceases to be dispensed from the nozzle, water or an appropriate solvent can, if necessary, be added to the hopper or connected to the Product Supply Hose to continue flushing until clean water/solvent is being dispensed from the nozzle.

Remove the water/solvent supply and continue to flush until only air is being dispensed from the nozzle, then turn ON/OFF switch to **OFF**.

8.2 DISMANTLING

To dismantle, proceed as follows:



DISCONNECT COMPRESSED AIR SUPPLY TO THE MACHINE.

Remove Tri-Clover clamp from Product Valve inlet and remove Product Supply Hose and Inlet Fitting, or hopper, complete with seal.

Remove tri-clover clamp from product valve outlet and remove nozzle gooseneck fitting complete with nozzle and rubber seal.

8.2.1 Rotary Valve model

Loosen the two T nuts to the valve end of the assembly. Do this by hand.

Once the T Nuts are entirely loosened, remove the Product Piston Rod Connecting Pin from the Main Air Cylinder Coupling by simply pulling the pin out.

Push the front rotary valve plate forward whilst holding the cylinder assembly in place.

The complete assembly can be now removed to a bench or sink where the component parts will simply pull apart for cleaning.

The parts making up this assembly are not fastened together, so be careful to keep the assembly together and do not allow them to separate.



NOTE: Assembly parts are made from 316 stainless steel and are expansive to repair and/or replace. Care must be taken to not damage these parts, especially the internal walls of the valve body and cylinder. It is recommended that assembly be dismantled on a bench then separate parts to be washed in a sink. **NEVER USE SCREWDRIVERS OR OTHER SHARP IMPLEMENTS.**

8.2.2 Spool Valve model

Spool Valve model - Remove the two airlines (one black, one blue) connected to the Spool Valve Air Cylinder from their connection fittings on the end of the machine frame. Push the plastic ring of the fixed female fittings inward and pull the male airline fittings to withdraw them.

Remove the Tri-Clover joining the Spool Valve to the Product Cylinder Extension Housing. Set aside Spool Valve assembly.

Loosen and remove the 2 stainless steel cylinder tie rod nuts on the left-hand side of the end mounting plate. These nuts have integral cross-bars for untightening BY HAND. (note that these nuts are of different sizes. The corresponding different hole sizes in the end mounting plate through which the tie rods pass ensure that the mounting plate cannot be subsequently re-assembled wrong way around).

Support the product cylinder extension housing with the right hand with with the left hand withdraw the end mounting plate complete with the extension housing from the tie rods.

Remove the product piston rod connecting pin from the main air cylinder coupling by simply pulling the pin out.

The product cylinder, piston and cylinder end plates can now be removed as an assembly by sliding the product cylinder assembly to the left until it is clear of the tie bars.

The parts making up this assembly are not fastened together, so be careful to keep the assembly together and do not allow them to separate.

The complete assembly can now be removed to a bench or sink where the component parts will simply pull apart for detailed cleaning.

Remove tri-clover clamp holding product inlet adaptor to spool valve. Using the appropriate spanners, hold the air cylinder stainless steel piston rod flange plate and undo the spool from the air cylinder. Withdraw the spool.

Remove spacer, glide-ring and O-rings for cleaning.

8.3 DISMANTLING PRODUCT PISTON ASSEMBLY & VALVE

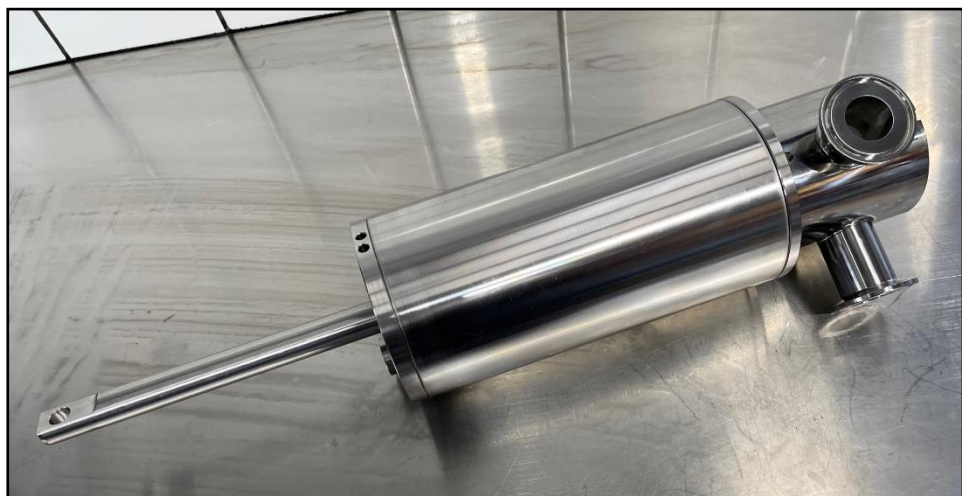
Now you have removed the assembly.

The cylinder and rotary valve are assembled with seals only. To dismantle, simply ease the parts apart by hand.



!!!DO NOT USE TOOLS OR HARD IMPLEMENTS!!!!

The parts that make up the cylinder and valve are critical parts of the machine and have been made from high quality 316 stainless steel, machined and honed to ensure they pass for use in cosmetic and food industries. If damaged, these parts will no longer be suitable and will need to be replaced, in particular the cylinder and valve body.





8.3.1 Piston glide ring removal

Once the piston has been removed from the cylinder, place on a bench with the appropriate spanners. Hold the flats on the piston head and undo piston rod from piston head. Remove stainless steel backing plate and Ertalyte wear ring. Slide Glide-Ring and O-ring off piston head.



!!!DO NOT USE SCREWDRIVERS OR OTHER SHARP IMPLEMENTS!!!

The piston head, seal grooves, and piston rod should be thoroughly cleaned.



Re-assembly is the reverse of the dismantling procedure. When refitting the Glide-Ring Seal and its O-ring to the piston head, particular care should be taken. The seal should be eased into place by hand - do not use screwdrivers or other sharp implements which will damage the seal. It is important that the seal is installed square on the piston head for its full circumference.

8.4 RE-FITTING PRODUCT PISTON

When refitting the piston to the Product Cylinder, first smear a little Vaseline or another lubricant onto the piston head seals, the cylinder bore, and the inside of the Seal Installation Ring.

NOTE: Cylinder has a 6mm bevel lead-in edge to the back of the cylinder. It's important the insert the piston into the bevelled end only. This is to assist in the assembly and to limit damage to the glide ring seal.



8.5 INSTALLING CYLINDER AND VALVE INTO MACHINE

The process of installation of the Cylinder and valve is the reverse of the removal

Ensure the rotary valve is installed to the correct side



ALIGN



Noting the notch in the valve body aligns to the key in the valve and the hole to the short inlet.

Place the assembly back in the machine, install the cylinder rod pin and tighten the two T-nuts. Ensure not to overtighten – these are made to be tightened by hand only.

9 SPARE PARTS AND CONSUMABLES

For spare parts and consumable items please visit

<https://rentafill.com.au/>

Or contact us directly on 02 9987 1871

Unit 11/6 Leighton place

Hornsby, NSW, 2077

----- THE END -----