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PVA-1GPU

Owner's Manual

Revision E

Precision Valve & Automation
6 Corporate Drive
Halfmoon, NY 12065

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Table of Contents

1. Introduction

Before you operate this system, read the operation and setup manual. This will help you to become familiar with the product and ensure successful operation.

If any questions or problems arise, contact PVA's Technical Support department.

1.1 PVA Contact Information

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1.2 Document History

Revision	Revision Date	Reason for Changes
REV E	October 2022	PSI Correction
REV D	March 2021	1GPU Redesign
REV C	July 2015	Images Updated
REV B	May 2015	Ram Design Update
REV A	June 2013	Initial Release

Note: All photographs and CAD model representations in this document are a "general representation" of the system and its components. The actual appearance of the system and its components can differ based upon customer specific configuration.

1.3 Safety

Certain warning symbols are affixed to the machine and correspond to notations in this manual. Before operating the system, identify these warning labels and read the notices described below. Not all labels may be used on any specific system.

Always wear approved safety glasses when you operate or work near the workcell.

Before you operate the system, read and understand the manuals provided with the unit.

Never put hands or tools in areas with this symbol when the machine is in operation. A dangerous condition may exist.

Read and understand the manuals provided with the unit before any repairs or maintenance is done. Only a qualified individual should do service.

Use caution when there are pressurized vessels. Find and repair any leaks immediately. Always wear appropriate safety equipment when you work with pressurized vessels or vessels that contain chemicals

Shear hazard from moving parts. Avoid contact.

Do not remove protective guarding.

In situations where inattention could cause either personal injury or damage to equipment, a warning notice is used.

Do not smoke near the machine. Always have a fire extinguisher available for emergency use.

Before performing any repairs or maintenance to the system, turn off power and lock out the power disconnect switch.

Warning notices are used to emphasize that hazardous voltages, current, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use. Only qualified personnel should enter areas designated with this symbol.

Laser light source present. Do not stare directly into the beam. Do not use in the presence of highly reflective surfaces

Pinch hazard from moving parts. Avoid contact.

Hot surface. Avoid contact.

Warning, Ultraviolet (UV) light hazard. Do not look directly at the UV light source.

This product meets EU standards for health, safety, and environmental protection.

Warning, no open flames.

Electrostatic sensitive device warning. Observe precautions for handling.

1.4 Theory of Operation

The PVA-1GPU is a simple hydraulic press made to extrude high viscosity, thermally conductive adhesives and gap fillers from 1-gallon steel pails. There are no internal moving parts to wear out or break down the integrity of the fillers. The PVA-1GPU uses normal, shop compressed air to operate and can be integrated with automation equipment.

1.5 Personal Protective Equipment

Operators must use eye protection at all times. Always wear gloves when handling materials and solvents. Refer to MSDS sheets on the material being dispensed for other precautions.

1.6 Waste Disposal

Dispose of all used parts and materials in accordance with local laws and regulations.

2. Pump Overview

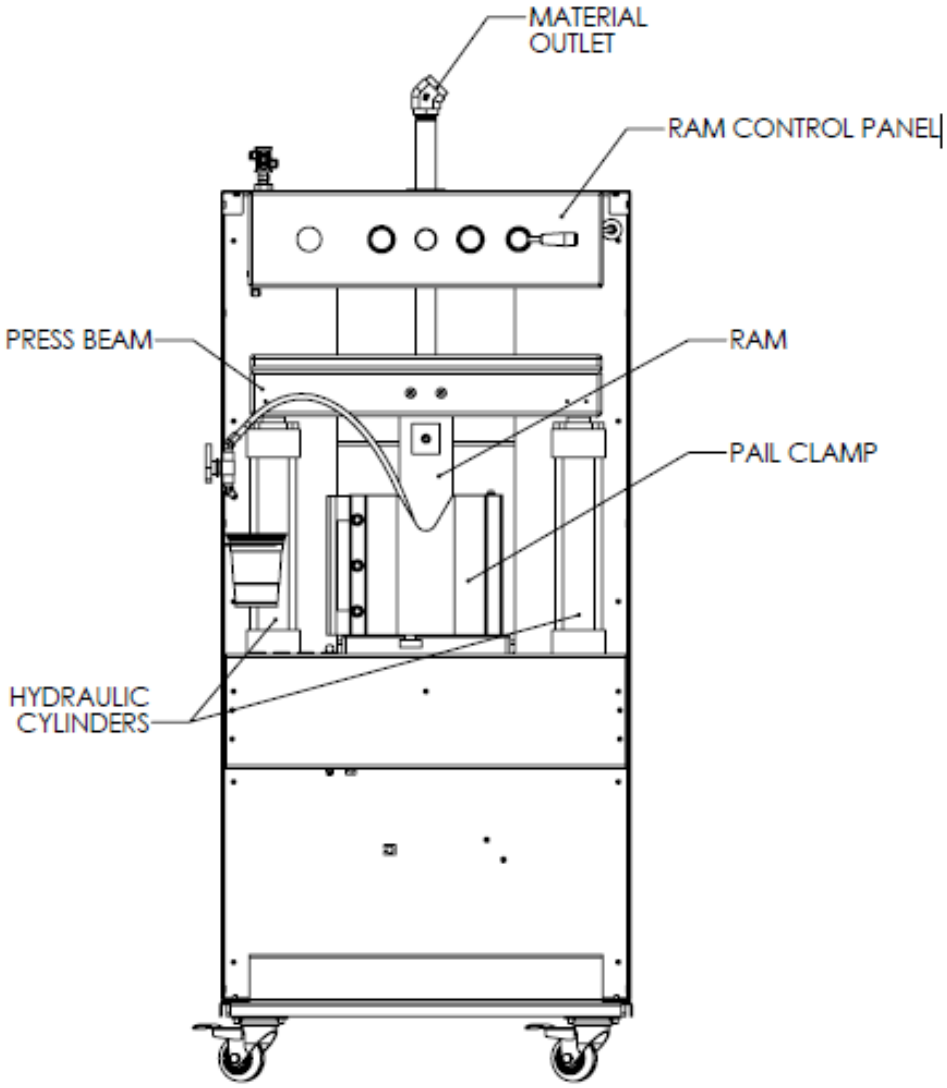

Figure 1: Pump Overview

2.1 Ram Overview

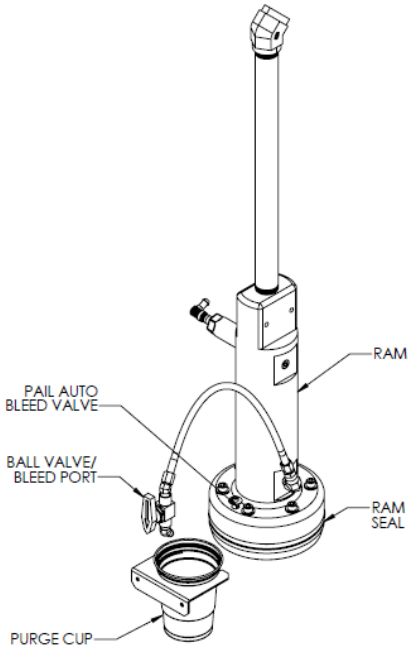

Figure 2: Ram Overview

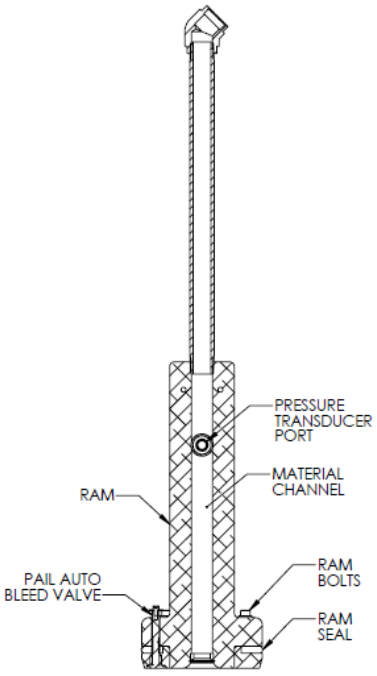

Figure 3: Ram Cross Section

3. Machine Requirements

3.1 Main Air Supply

Supply the system with 70-100 psi of clean, dry air. It connects at the main air supply.

Figure 4: Main Air Supply

4.Ram Controls

Figure 5: Ram Control Panel

4.1 Ram Up

- Put the 3-position hand lever in the **RAM UP** position to raise the ram out of the pail.
- The rate at which the ram moves up is controlled by the ram up pressure.
- Adjust the ram up pressure with the ram regulator (refer to Section **Error! R eference source not found.**).

Figure 6: Ram Up

4.2 Ram Down

- Put the 3-position hand lever in the **RAM DOWN** position to lower the ram into the pail.
- The rate at which the ram lowers is controlled by the ram down pressure.
- Adjust the ram down pressure with the ram regulator (refer to Section 4.4).

Figure 7: Ram Down

4.3 Ram Hold

- Put the 3-position hand lever in the **RAM HOLD** position to keep the ram in the position it is in.
- System pressure is relieved in the **RAM HOLD** position. The **RAM HOLD** position is used whenever the pump is not in operation, or when you want to keep the ram in a position.

Note: You cannot dispense material in the RAM HOLD position.

Figure 8: Ram Hold

4.4 Ram Regulator

The ram regulator controls the ram up and down pressure. To adjust the ram pressure:

1. Turn the Ram Regulator knob to the necessary pressure position as shown on the Ram Drive Pressure Gauge.
2. As you turn the Ram Regulator knob, the pressure will change slowly. Wait for the pressure to adjust. Do not exceed 90 psi (620 kPa).

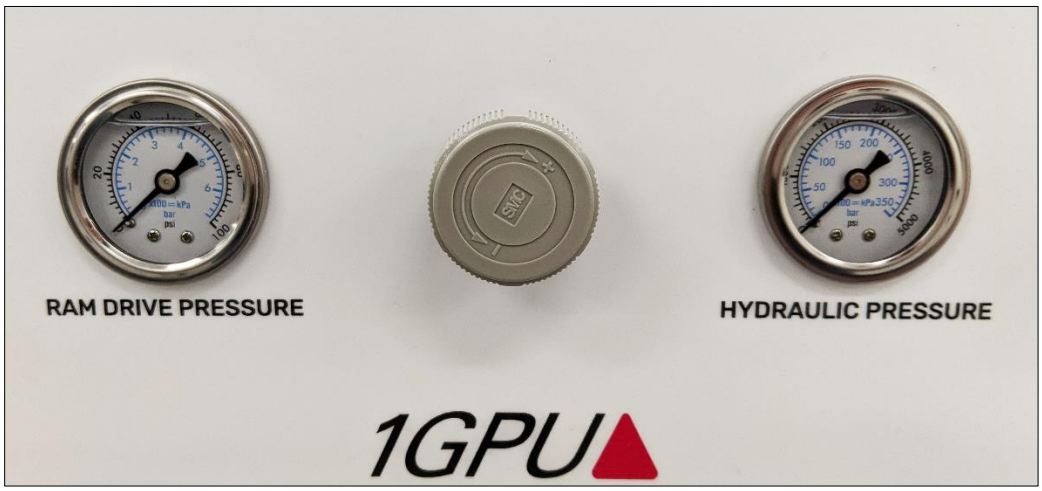

Figure 9: Ram Down Regulator

5. Pump Operation

5.1 How to Remove a Pail

1. Close the front and rear doors. Make sure they are latched.

Figure 10: Door Latched

2. Put the 3-position hand lever in the **RAM UP** position.

Figure 11: Ram Up

3. Turn the Ram Regulator knob to adjust the ram pressure to a maximum of 80 psi.

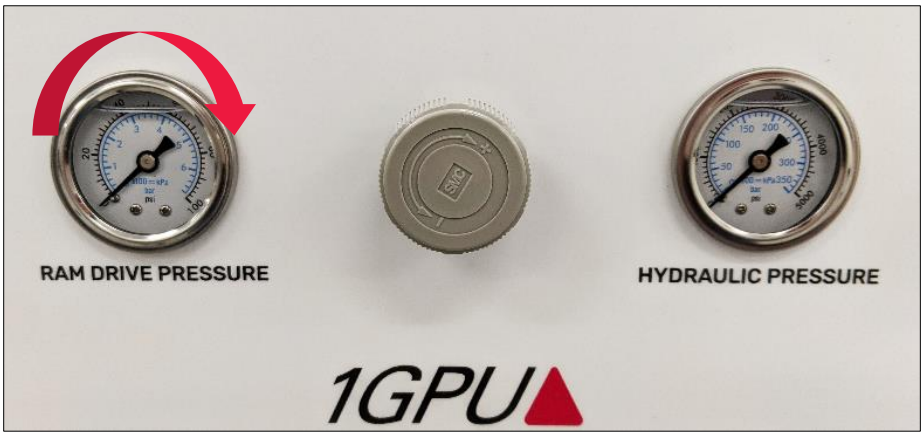

Figure 12: Ram Drive Pressure 80 psi

4. Let the ram lift completely out of the pail clamp. The bottom of the ram should be about 1" above the top of the pail clamp.
5. Put the 3-position hand lever in the "RAM HOLD" position.

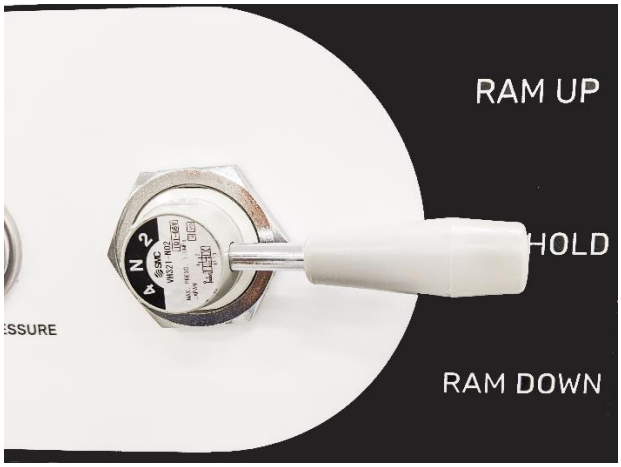

Figure 13: Ram Hold

6. Open the front door.
7. Use the 3/8" T-handle hex key to remove the three machine screws from the pail clamp.

Figure 14: Remove Screws from Pail Clamp

8. Open the pail clamp.

Figure 15: Screws Removed, Pail Clamp Open

9. Remove the old pail.
10. Wipe the ram seal thoroughly and lubricate with mineral oil.
11. Install a new pail.

5.2 How to Install a New Pail

Note: Clean and lubricate the ram seal between each pail change. Refer to Section 6.3 for the procedure. It is necessary to replace the ram seal periodically, spare seals should be kept on hand. Refer to Section 6.1 for the procedure.

1. Put a new pail in the pail clamp.
2. Turn the pail so that handle protrusions line up with the slot in the pail clamp.

Figure 16: Pail Handle Slot

3. Close the front pail clamp. Turn the pail, if necessary, to make sure the pail is correctly installed on the base.
4. Put the three machine screws in the pail clamp again.

Figure 17: Install the Screws

5. Tighten the three machine screws with the 3/8” T-handle hex key.
6. Close the front door.
7. Put the 3-position hand lever in the **RAM DOWN** position.

Figure 18: Ram Down

8. Use the Ram Regulator knob to adjust ram down pressure and increase or decrease the rate that the ram lowers into the pail.

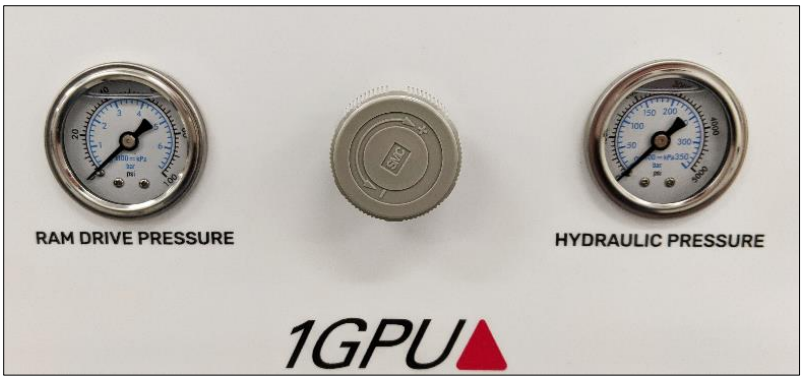

Figure 19: Adjust Ram Down Pressure

9. Lower the ram until the ram seal starts to enter the top of the pail. Put the 3-position hand lever in the RAM HOLD position. Refer to Section 5.3 on how to bleed the valve.

5.3 How to Bleed Air from the Ram

After a new pail has been installed, it is necessary to bleed any air that is in the ram before you begin to dispense.

1. Open the front door.
2. Turn the front ball valve to the open position.

Figure 20: Front Ball Valve Open

3. Close the door.
4. Put the 3-position hand lever in the **RAM DOWN** position. To stop the ram at any time, put the 3-position hand lever in the **RAM HOLD** position.

5. Use the Ram Regulator knob to adjust pressure as necessary.
6. Continue to lower the ram into the pail. The material will flow through the bleed port into the purge cup. Any break in the flow of the material shows there is air in the system. Bleed the pump until all the air is released and there are no breaks in the flow.
7. Put the 3-position hand lever in the **RAM HOLD** position to stop the ram.
8. Open the door.
9. Turn the front ball valve to the closed position.

Figure 21: Front Ball Valve Closed

10. Clean the purge cup and the bleed port as necessary.

5.4 Normal Pump Operation

1. Make sure pail is correctly installed. Refer to the procedure in Section 5.2.
2. Make sure the front and rear doors are closed and latched.

Note: The pump will not operate if the door is open.

3. Make sure all air has been bled from the ram. Refer to the procedure in Section 5.3.
4. Put the 3-position hand lever in the **RAM DOWN** position.
5. Use the Ram Regulator knob to adjust the ram down pressure to the necessary setting.

Note: The theoretical hydraulic material pressure ratio is 4:1 (for example: if the hydraulic pressure is 1600 psi then the material pressure in the 1-gal pail is approximately 400 psi).

5.5 System Shutdown Procedure

5.5.1 Overnight Pump Shutdown

1. Put the 3-position hand lever in the RAM HOLD position.
2. Turn the main air shutoff to the “Off” position.

5.5.2 Long-Term Pump Shutdown

1. Put the 3-postion hand lever in the RAM HOLD position.
2. Turn the main air shutoff to the “Off” position.
3. Remove the ram if necessary, and clean thoroughly with appropriate solvent.

6.Maintenance

1. Inspect the hydraulic oil level in the reservoir on a weekly basis. If the level drops, inspect the machine for leaks and repair as necessary. Fill the reservoir with hydraulic oil, as specified.

Figure 22: Hydraulic Oil Level

2. The ram seal should be cleaned and lubricated between each pail change. The ram seal will also require periodic replacement, so spare seals should be kept on hand.

Note: Be careful not to damage the ram seal when you remove it.

6.1 How to Remove the Ram Seal

1. Put the 3-position handle in the **RAM UP** position.
2. Lift the ram up all the way.

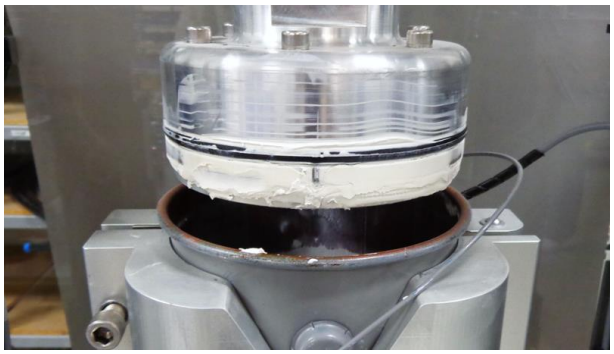

Figure 23: The Ram Lifted

3. Use a 4 mm hex key to loosen and remove the bleed valve assembly. You may have to hold the bleed valve assembly with an adjustable wrench while you loosen the top bolt.

Figure 24: Remove the Bleed Valve Assembly

4. Use a 6 mm hex key to loosen the six ram bolts.

Figure 25: Loosen the Ram Bolts

5. Remove the bolts one at a time and hold the lower ram in place so it does not fall off.

Figure 26: Remove the Ram Bolts

6. Pull the lower ram and the ram seal down off of the upper ram.

Figure 27: Remove the Ram Seal by Hand

7. Clean the upper and lower Ram.
8. Clean and examine the ram seal for damage and wear.
9. If the ram seal is damaged or worn, replace it. Refer to Sections 6.3 and 6.2 to install and lubricate a new ram seal.
10. If the ram seal is not damaged, refer to Sections 6.3 and 6.2 to install and lubricate a new ram seal.

6.2 How to Install the Ram Seal

1. Align the ram seal on the lower ram. Make sure all of the holes align.

Figure 28: Ram Seal Installed on the Lower Ram

2. Put the ram seal and lower ram on the upper ram. Make sure all of the holes align. You should be able to see through the bleed valve assembly hole.
3. Install the six ram bolts with washers. Use a 6mm hex key to tighten them.

Figure 29: Install the Ram Bolts

4. Clean the bleed valve assembly and make sure the O-ring is installed.

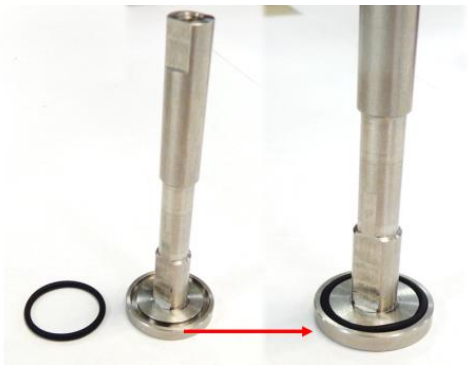

Figure 30: Install the Bleed Valve Assembly O-ring

5. Install the bleed valve assembly into the ram. The round bottom of the bleed valve assembly will fit into the groove in the bottom of the lower ram.

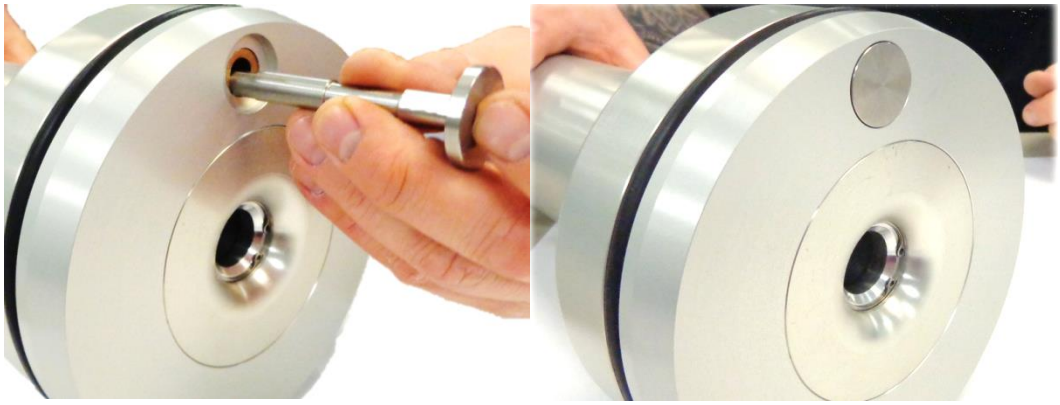

Figure 31: Install the Bleed Valve Assembly

6. Install the M5x6 bolt with a M5 fender washer into the bleed valve assembly.

Figure 32: Install Washer and Bolt

7. Use a small adjustable wrench to hold the bleed valve assembly while you tighten the top bolt with a 4mm hex key.

Figure 33: Tighten the Bleed Valve Assembly Bolt

6.3 How to Lubricate the Ram Seal

1. Apply mineral oil to the ram seal.
2. Rub the mineral oil into the ram seal with your hand, or with a clean lint-free towel.

Figure 34: Rub the Mineral Oil into the Ram Seal

7. Pump Options

The following options are available. Please contact PVA for more information.

7.1 Shutoff Options

The PVA-1GPU comes standard with a manual main air shutoff. However, an electric solenoid main air shutoff is available as an option. This allows a remote machine to control the main air supply to the pump.

Figure 35: Standard Manual Main Air Shutoff

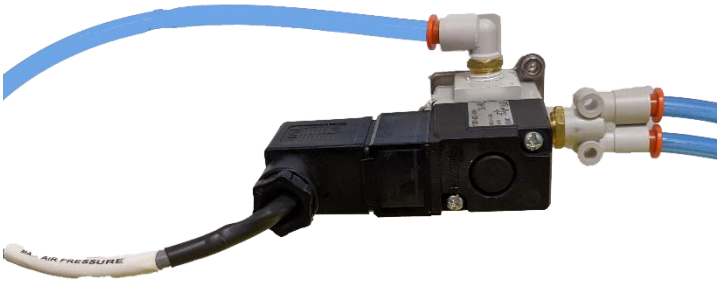

Figure 36: Electric Solenoid Main Air Shutoff

7.2 Material Level Sensors

The PVA-1GPU comes standard with two material level sensors which will send an input to a remote machine. These sensors show a material “Low Level” and “Empty” condition. The sensors are available in both PNP and NPN types. The sensor type on the PVA-1GPU will depend on the control logic of the remote machine. The customer should specify the sensor type with the machine order.

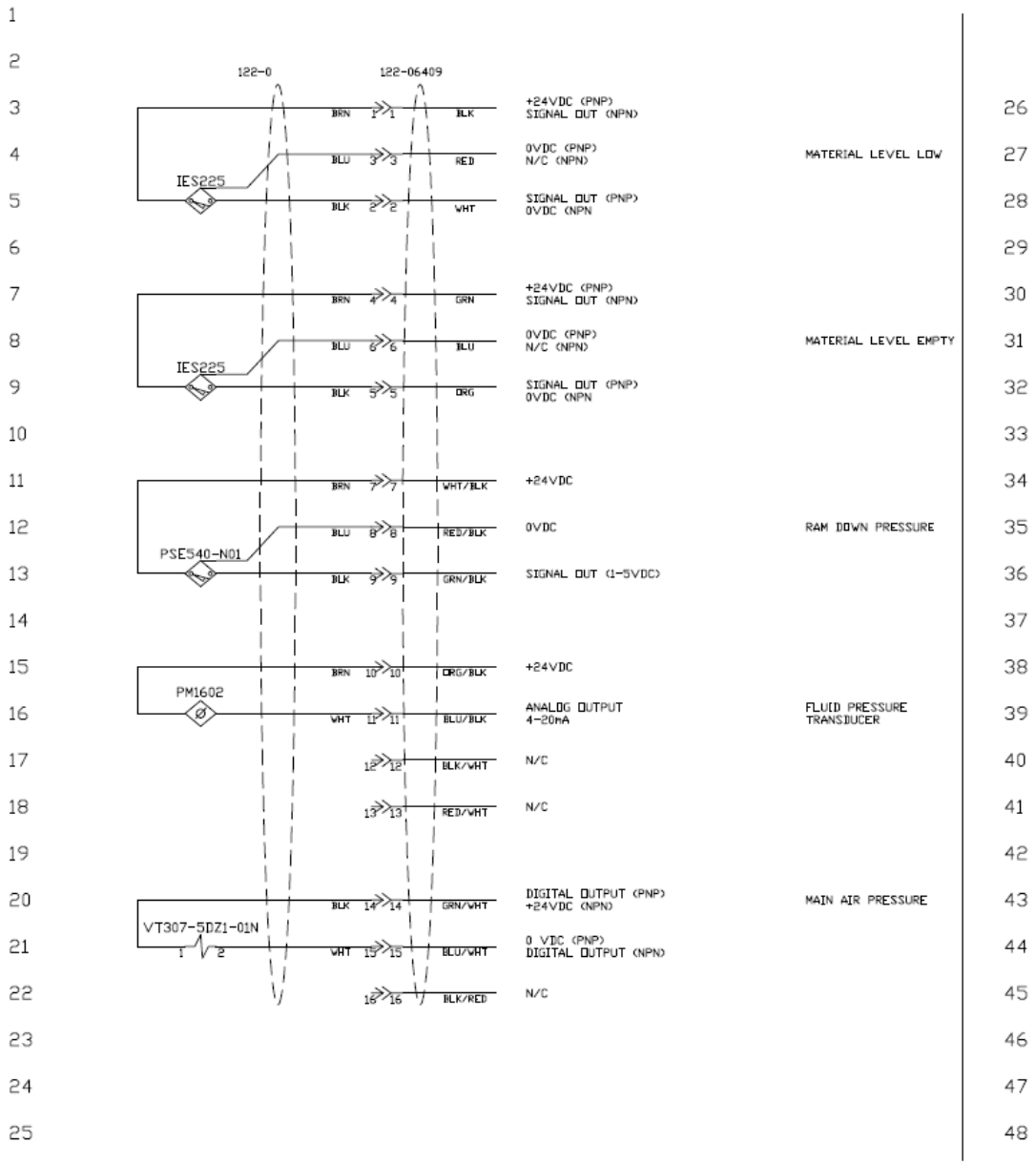

Figure 37: Electrical Schematic

8.Recommended Spare Parts

Refer to your machine specific manual for custom options that may be on your pump as well as a complete machine bill of materials.

Table 1: Replacement Parts and Accessories

Description	Part Number	Notes
Ram Seal	214-12095	
O-ring seal	VLV-018V	
Hydraulic Oil, 1 gal	2158K12	

Contact PVA for information on replacement parts or to order.

9. Technical Specifications

Maximum process pressure	1000 psi (67 bar)
Maximum hydraulic (discharge) pressure	4000 psi (275 bar)
Hydraulic: process material pressure ratio	4:1
Fluid outlet size	1" NPT (F)
Wetted Parts	Seals- Viton, Buna-N Ram- Aluminum, stainless steel, carbon steel
Hydraulic Fluid	Mobil DTE25, ISO Grade 46
Machine air supply pressure	70-100 psi (4.8 -6.9 bar)

10. Troubleshooting

Problem	Possible Cause	Corrective Action
Pressure will not build	• Doors are not closed • 3-position hand lever is in the RAM HOLD position • Ram Up pressure or Ram Down pressure is too low • Main air supply is shut off	• Shut door correctly • Put the 3-position hand lever in RAM DOWN position • Use the Ram Regulator to increase pressure to the pump • Open main air supply valve
Material leaks past the ram seal	• Seal is torn or damaged from seam inside pail • Seal is twisted or not correctly seated in the ram groove • Pail is deformed or otherwise damaged	• Inspect the welded seam inside pail for sharp edges, replace ram seal if necessary • Refer to Section 6.2 for correct ram seal installation instruction • Return pail to material manufacturer and replace with pail that is not damaged
Hydraulic pump cycles rapidly when system is up to pressure	• Contamination in the hydraulic pump spool valve • Worn seals in the hydraulic pump spool valve	• Reference attached manual for Haskel 4B series air driven hydraulic pump • Reference attached manual for Haskel 4B series air driven hydraulic pump
Inconsistent dispense volumes through the applicator valve	• System not correctly bled of air • Supply hose to dispense valve is sized too small • Hydraulic pump is not holding consistent pressure	• Refer to Section 5.3 for instructions on how to bleed the pump • Consult PVA for correct hose sizing • Reference attached manual for Haskel 4B series air driven hydraulic pump

11. Table of Figures

12. Notes

13. Warranty

PVA Warranty Policy

PVA warrants the enclosed product against defects in material or workmanship on all components for one year from the date of shipment.

The warranty does not extend to components damaged due to misuse, negligence, or installation and operation that are not in accordance with the recommended factory instructions. Unauthorized repair or modification of the enclosed product, and/or the use of spare parts not directly obtained from PVA (or from factory authorized dealers) will void all warranties.

All PVA warranties extend only to the original purchaser. Third party warranty claims will not be honored at any time.

Prior to returning a product for a warranty claim, a return authorization must be obtained from PVA's Technical Support department. Authorization will be issued either via the telephone, facsimile, or in writing upon your request.

To qualify as a valid warranty claim, the defective product must be returned to the factory during the warranty period. Upon return, PVA will repair (or replace) all components found to be defective in material or workmanship.

(Retain this for your records)

Product Information:

PRODUCT: _____

SERIAL NUMBER: _____

DATE OF PURCHASE: _____