

Installation, Operation & Maintenance Instruction



Bulletin #: PS-IOM-HYP-0203-I

PULSAR®
HYPOPUMP®
SODIUM HYPOCHLORITE
METERING PUMP

USER NOTE: This serves as additional information for Pulsafeeder PULSAR® and PULSAR Shadow® metering pumps equipped with the Automatic Valve Assembly for purging trapped gasses from the reagent head. You must also reference the latest revision of the complete PULSAR® or PULSAR Shadow® pump IOM for critical safety and operational information.

FACTORY SERVICE POLICY

If you are experiencing a problem with your Pulsafeeder pump, first review the IOM, and consult the troubleshooting guide. If the problem is not covered or cannot be solved, please contact your local PULSA Series Sales Representative or our Technical Service Department at (585) 292-8000 for further assistance.

Trained individuals are available to diagnose your problem and arrange a solution. Solutions may include purchasing a replacement unit or returning the pump or components to the factory for inspection and repair. All returns require a Return Material Authorization (R.M.A.) number to be issued by Pulsafeeder.

Certain components may be purchased for replacement. Parts purchased to correct a warranty issue may be credited after examination of the original parts by Pulsafeeder personnel. Parts returned for warranty consideration that test satisfactorily, will be sent back to the originator freight collect.

Any field modifications will void the Pulsafeeder warranty. Out-of-warranty repairs will be subject to Pulsafeeder's standard bench fees and testing costs associated with replacement components.

Notice

Information and specifications in this document are subject to change without notice.

Revision History:

Rev H (8-17-06)

- Add recommendation for use of GFCI circuit

Rev I (5-14-14)

- Moved retrofit information to section 9 "Maintenance" as a note
- Updated label drawing

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1. Conventions

For the remainder of this bulletin, the following Conventions are in effect.



A WARNING DEFINES A CONDITION THAT COULD CAUSE DAMAGE TO BOTH THE EQUIPMENT AND THE PERSONNEL OPERATING IT. PAY CLOSE ATTENTION TO ANY WARNING.



Notes are general information meant to make operating the equipment easier.



Tips have been included within this bulletin to help the operator run the equipment in the most efficient manner possible. These “Tips” are drawn from the knowledge and experience of our staff engineers, and input from the field.

The Automatic Valve Assembly, designed for purging entrained gas from the pump reagent head, is referred to in this manual as the “AVA”.

2. General Safety

The Automatic Valve Assembly (AVA) was designed as a gas handling/priming aid for operation solely with Pulsafeeder PULSAR[®] and PULSAR Shadow[®] metering pumps. Use for any other application is considered un-safe and voids all certification markings and warranties.

2.1 Explosive Atmosphere Safety



Explosion Hazard -- Do not perform installation or maintenance of any kind on this device while circuit is live and/or the area is known to be hazardous. This unit is not intended for use in explosive or hazardous locations.

2.2 Electrical Safety

Improper application and use of the AVA can be hazardous. You are solely responsible for its use.

The AVA electrical installation must conform to all relevant electrical codes. Installation and electrical maintenance must be performed by a qualified electrician. Before installing or servicing this device, all power must be disconnected from the source at the main distribution panel.

The AVA emits electro-magnetic energy. Its use is restricted to industrial applications. You are responsible for shielding this device if necessary.

It is recommended that the AVA be powered from a Ground Fault Circuit Interrupter (GFCI) protected electrical circuit.

2.3 Hydraulic Safety

Thoroughly review and adhere to the contents of the latest version of the PULSAR[®] or PULSAR Shadow[®] Installation, Operation, Maintenance (IOM) manual for hydraulic installation of your metering pump.

3. Equipment Inspection

When you receive your order, check all equipment for:

- Completeness against the shipping document / purchase order
- Evidence of shipping damage.

Shortages or damage should be reported immediately to the carrier and your PULSAFEEDER representative.

4. Storage

The AVA can be successfully stored for extended periods. The key to this success is temperature and humidity control.



Be certain to follow the additional storage instructions provided in the IOM for the PULSAR[®] or PULSAR Shadow[®] pumps, and also those included in the IOM for any controllers (DLC, DLCM, ECA) that are attached to the pump.

4.1 Short Term (0 - 12 months)

The AVA should be stored in a temperature and humidity controlled environment. It is preferable to keep the temperature constant in the range of -18 to 60° Celsius (0 to 140° Fahrenheit). The relative humidity should be 0 to 90% non-condensing.

If the AVA is installed on the pump, it should not be removed during this period – provided the above conditions can be applied to the pump as well. If the AVA was shipped in its own carton, it should be stored in that carton.

4.2 Long Term (12 months or more)

Storage of the AVA for periods of longer than twelve months is not recommended. If extended storage is unavoidable the AVA should be stored in accordance with those conditions stipulated for Short Term Storage. In addition, a porous bag of 85g (3 oz) silica gel or similar desiccant should be placed inside the AVA enclosure. The cover should be re-installed to seal the desiccant within the enclosure. The conduit connection must be tightly capped.

5. Overall System Diagram

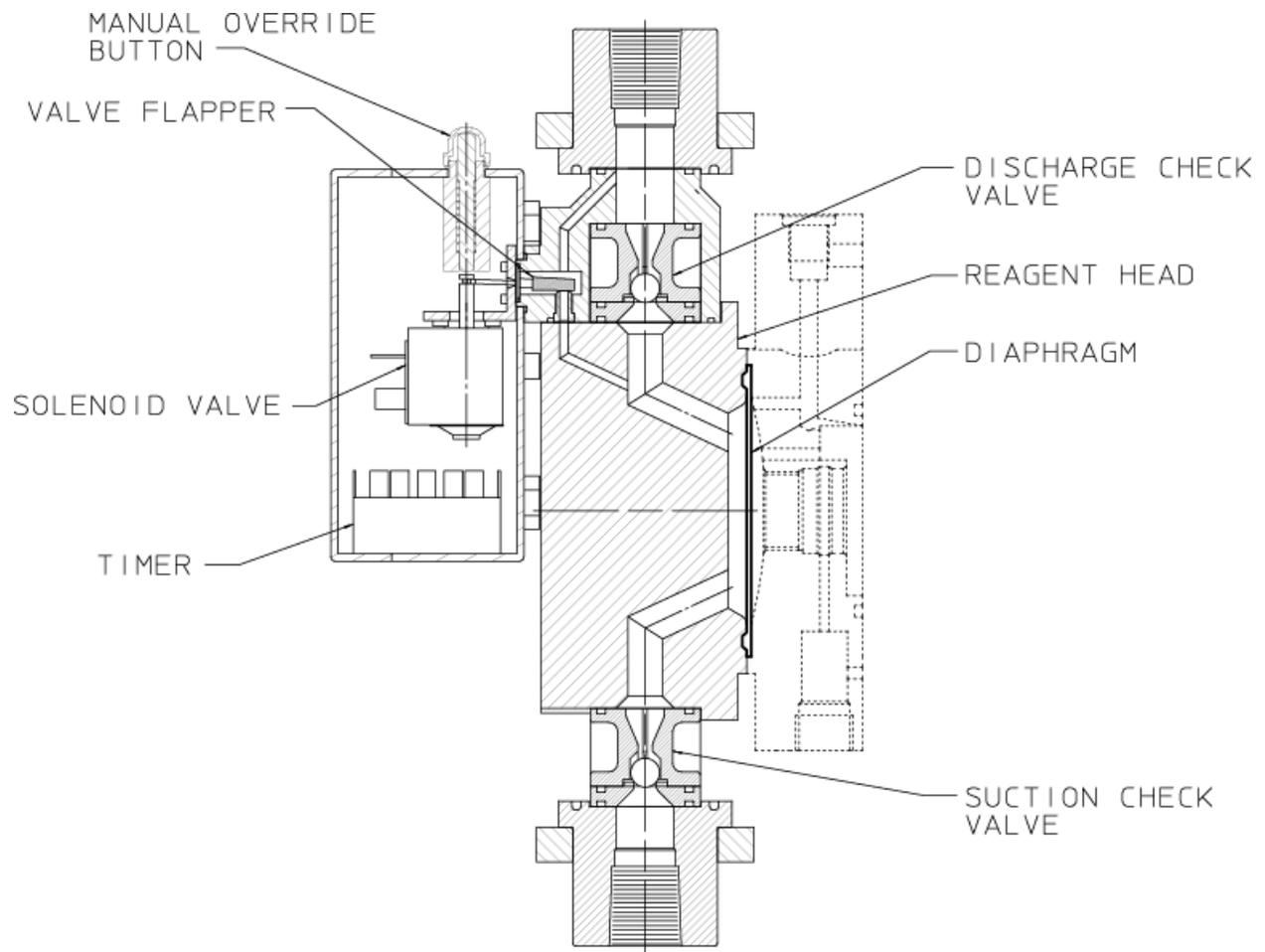


Figure 1

PULSAR[®] HypoPump[®] System Diagram

6. Installation

6.1 Location



Review the Safety section prior to installing the pump with AVA. It contains information required to properly install and operate the AVA in an industrial environment.

Review the PULSAR® or PULSAR Shadow® Installation Operation Maintenance manual provided with your metering pump. It details system related issues that are important to proper operation of the pump and also the AVA. The AVA should be mounted in an area where the operator has access to the front of the unit. Avoid locations where the AVA would be subjected to extreme cold or heat. Note the warning statement on the next page. The installation of this device must comply with national, state and local codes.

Allow 6 inches minimum clearance from the front of the AVA enclosure to allow for removal and re-installation of the AVA as a unit.

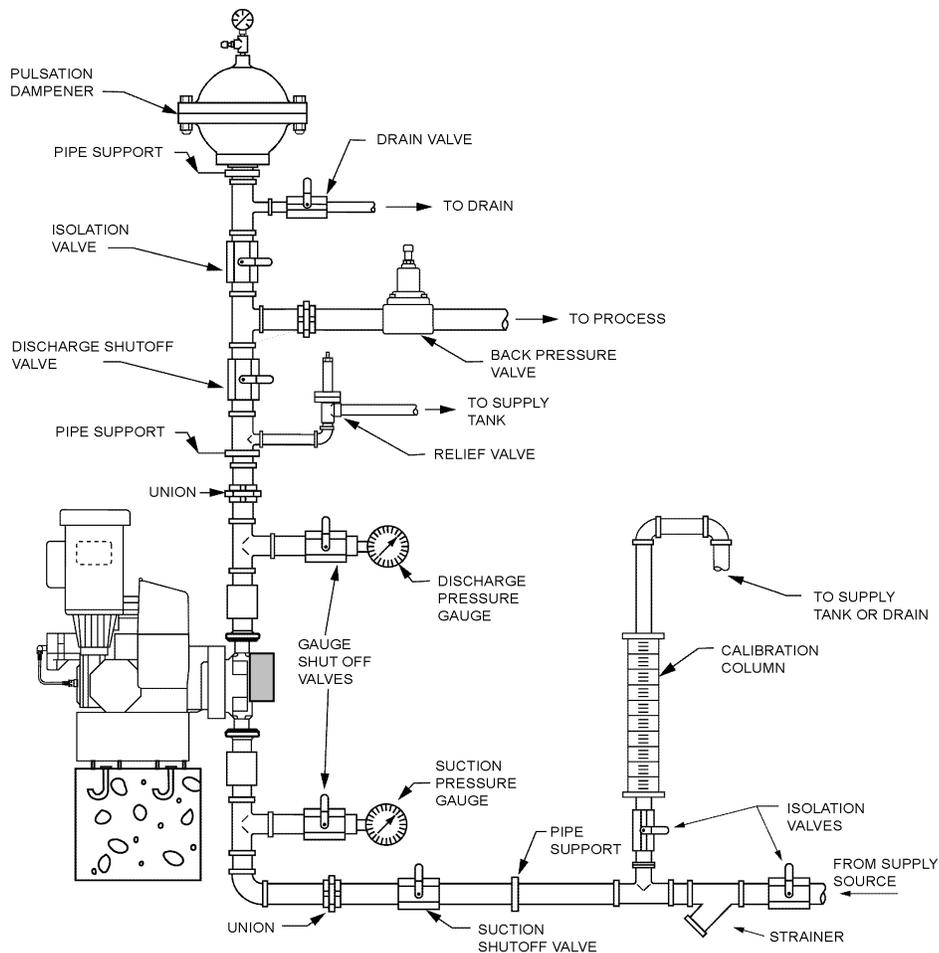


Figure 2 – Typical Installation.



AVOID LOCATIONS WHERE THE AVA WOULD BE SUBJECTED TO EXTREME COLD OR HEAT OR DIRECT SUNLIGHT. FAILURE TO OBSERVE THIS WARNING COULD DAMAGE THE AVA AND VOID ITS WARRANTY

MINIMUM OPERATING TEMPERATURE 0° CELSIUS / 32° FAHRENHEIT
MAXIMUM (PVC CONSTRUCTION) 49° CELSIUS / 120° FAHRENHEIT
MAXIMUM (PVDF CONSTRUCTION) 65° CELSIUS / 150° FAHRENHEIT

6.2 Installation Notes

1. Do not make any electrical connections without adequate grounding.
2. Conduit connections can carry fluids and vapors into the AVA causing damage and voiding the warranty. Care should be taken when installing conduit to protect against fluid/vapor entry. If necessary, provide sealed entries or conduit drains near the point of entry.
3. It is recommended that the AVA be powered from a Ground Fault Circuit Interrupter (GFCI) protected electrical circuit.

6.3 Electrical Wiring

The AVA is available in two voltages, and is rated as follows:

115 VAC, 50/60 Hz, 0.2 A
OR
230 VAC, 50/60 Hz, 0.1 A



Figure 3

AVA Rating is listed on the HypoPump box



Install wiring to the unit using a minimum of 18 inches of flexible conduit or cable attached to the automatic valve assembly in order to facilitate removal of the valve assembly from the reagent head for cleaning or maintenance.

Wiring must conform to all applicable codes. Prior to pump startup, always check to ensure that the AVA voltage and frequency matches that of the power supply. It is recommended that the AVA be powered from a Ground Fault Circuit Interrupter (GFCI) protected electrical circuit.

1. Remove the enclosure cover from the front of the valve assembly. The plastic screw hole plugs can be pried out using a flat bladed tool.
2. Bring AC power and ground wires into valve assembly enclosure through the 7/8" diameter hole in the side of the enclosure. Use #18 AWG 105 degree C insulation wire size minimum. Connect per the appropriate wiring diagram, see *Section 11*. The wiring diagram is also reproduced on a label affixed to the back of the enclosure cover.
3. Apply power to the valve assembly with or without the pump running. Verify that the solenoid pulls the valve lever down every 30 seconds.
4. Reattach cover and replace plastic screw hole plugs.

7. Description and Operation

7.1 Principle of Operation

Reciprocating metering pumps are used with a wide variety of chemicals, such as sodium hypochlorite, that produce gas within the piping and pump systems. This gas can accumulate in the pump reagent head, causing the pump to “air bind” and lose prime.

The Automatic Valve Assembly (AVA) prevents this by allowing a small amount of pressurized fluid from the discharge line to bleed back into the pump head, thereby helping to keep the pump head primed and also displacing gas through the discharge check valve. The system also has a Manual Override Button to enable faster pump priming at pump startup or other situations.

7.2 General Description

The PULSAR[®] and PULSAR Shadow[®] HypoPump[®] system consists of the pump reagent head, suction and discharge valves, and Automatic Valve Assembly (AVA). The AVA consists of a pressure balanced valve which opens periodically to allow fluid from the discharge line to bypass the discharge check valve and flow back into the pump head. The valve is actuated by a solenoid controlled by a solid-state timer. This pre-set timer will operate properly in the majority of HypoPump applications.

Power supply required is 115 or 230 VAC, 50 or 60 hz. All electrical components are enclosed in a NEMA 4X (IP 65) enclosure, which is isolated from the pumped fluid. The timer is preset at the factory to open for 0.25 second every 30 seconds in order to achieve optimum gas handling time with minimal pump capacity loss. The valve assembly is easily removed from the pump head in order to access the discharge check valve for cleaning or replacement. The automatic valve assembly can be run independently of the pump motor and/or controls.

7.3 Operation of Manual Override Button

The Manual Override Button functions as a fast priming aid. For best results press the button down for 1 second every few seconds. Do not hold the button down continuously.

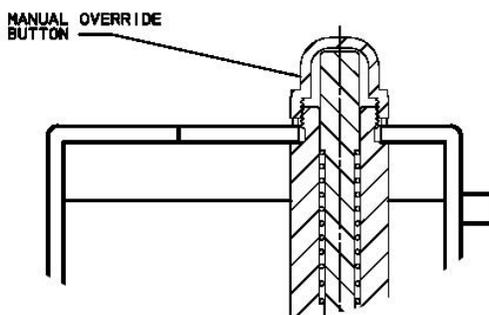


Figure 4

8. Maintenance



NOTE: This section only refers to models purchased and installed prior to [date] and is for reference only. Replacement parts are no longer available to retrofit. *Converting from the HypoPump® to the HypoPump®2 does not have any port-to-port changes. Consult the HypoPump2® Addendum for replacement instructions.*

8.1 Automatic Valve Assembly Removal

1. Disconnect the power source to the pump drive motor. If you plan to maintain the AVA itself, remove power from the AVA unit. For maintenance to the check valves only, the AVA need not be disconnected.
2. Relieve all pressure from the piping system.
3. Close the inlet and outlet shutoff valves.
4. Take all precautions to prevent environmental and personnel exposure to hazardous materials.
5. Loosen the suction valve tiebar bolts and shift the suction piping slightly to drain any liquid from the reagent head cavity. If the piping is closely connected it may be necessary to disconnect a union or flange.
6. Loosen the tiebar bolts on the discharge valve and shift the piping slightly to drain any liquid.
7. Slide the valve assembly away from the front of the reagent head. Take care to not let the check valve parts fall out of the bottom of the valve assembly as it is removed from the reagent head.
8. Once the AVA is separated, the discharge check valve components can be removed from the assembly and cleaned or replaced.
9. Installation is the reverse of the above procedure. Be sure that the oval shaped o-ring on the bottom of the valve assembly is in the proper position when reinstalling the valve assembly.



The O-ring seals used in the check valve and AVA are critical to product containment and pump operation. All o-rings should be inspected carefully and any that show signs of damage or wear should be replaced. The owner may wish to replace these seals any time the AVA assembly is removed from the pump.

8.2 Flapper Valve Replacement

1. Remove automatic valve assembly completely from pump, as per the instructions in the previous section.
2. Remove enclosure cover.
3. Lift the timer up from the bottom of the enclosure and then pull it straight out of the enclosure.
4. Remove the four socket head screws holding the solenoid bracket inside the enclosure. Note that the check valve body will come off the outside of the enclosure also. Make sure that the o-ring is in the groove in the check valve body.
5. Lift the solenoid/bracket assembly out of the enclosure. The valve flapper will slide away from the solenoid shaft. Be careful not to lose the spring at the bottom of the solenoid shaft.
6. Discard the green Viton valve flapper and place a new one in the rectangular counterbore in the check valve body. Locate the boss on the check valve body in the rectangular cutout in the enclosure, making sure that the body o-ring is in its groove.
7. Slide the solenoid/bracket assembly over the two spring pins in the check valve body, making sure that the two tangs on the valve flapper slide into the groove at the end of the solenoid shaft. Reassemble the four socket head screws.
8. Torque screws to 15 in lbs. **Do not overtighten.**
9. Check to see that the valve flapper moves freely, and then reassemble the cover to the enclosure.
10. Replace the check valve in the body making sure that it is oriented correctly.
11. Reinstall the valve assembly on the pump head per the instructions in the previous section.

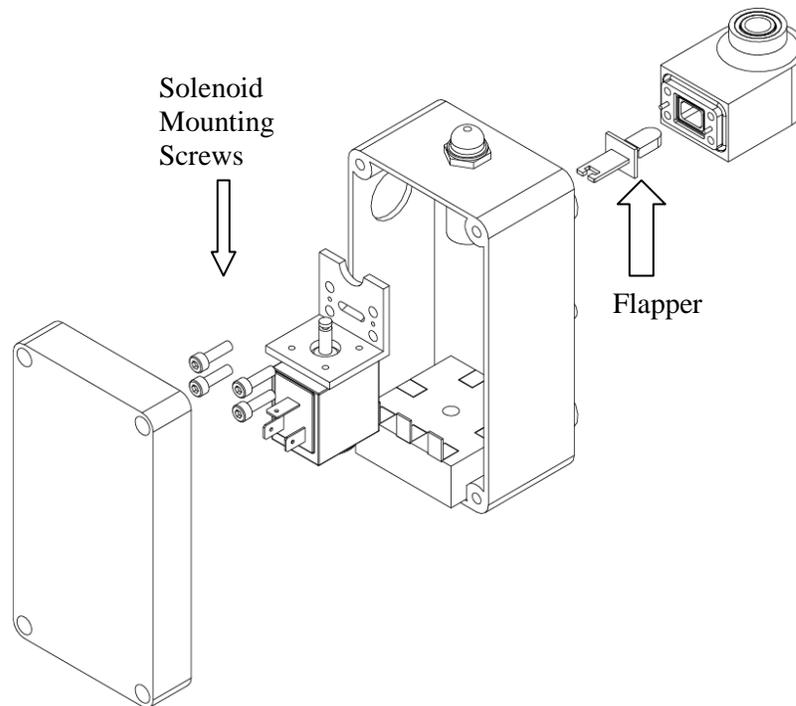


Figure 5

9. Troubleshooting Guide

Symptom	Probable Cause	Possible Solution
Pump does not prime (product side)	Purge relay not operational	Verify power is present at timing relay.
	Valve flapper not actuating	Remove cover from valve assembly and verify that solenoid is actuating valve flapper.
	Check valves fouled or damaged	Clean or replace suction and/or discharge check valves as per pump IOM.
	Power interruption	Check that power is connected to the AVA
	Flapper worn or damaged.	Clean or replace flapper per pump manual.
Low pump delivery	Check valves fouled or damaged.	Clean or replace suction and/or discharge check valves as per pump IOM.
	Calibration or testing error	Evaluate cause and correct

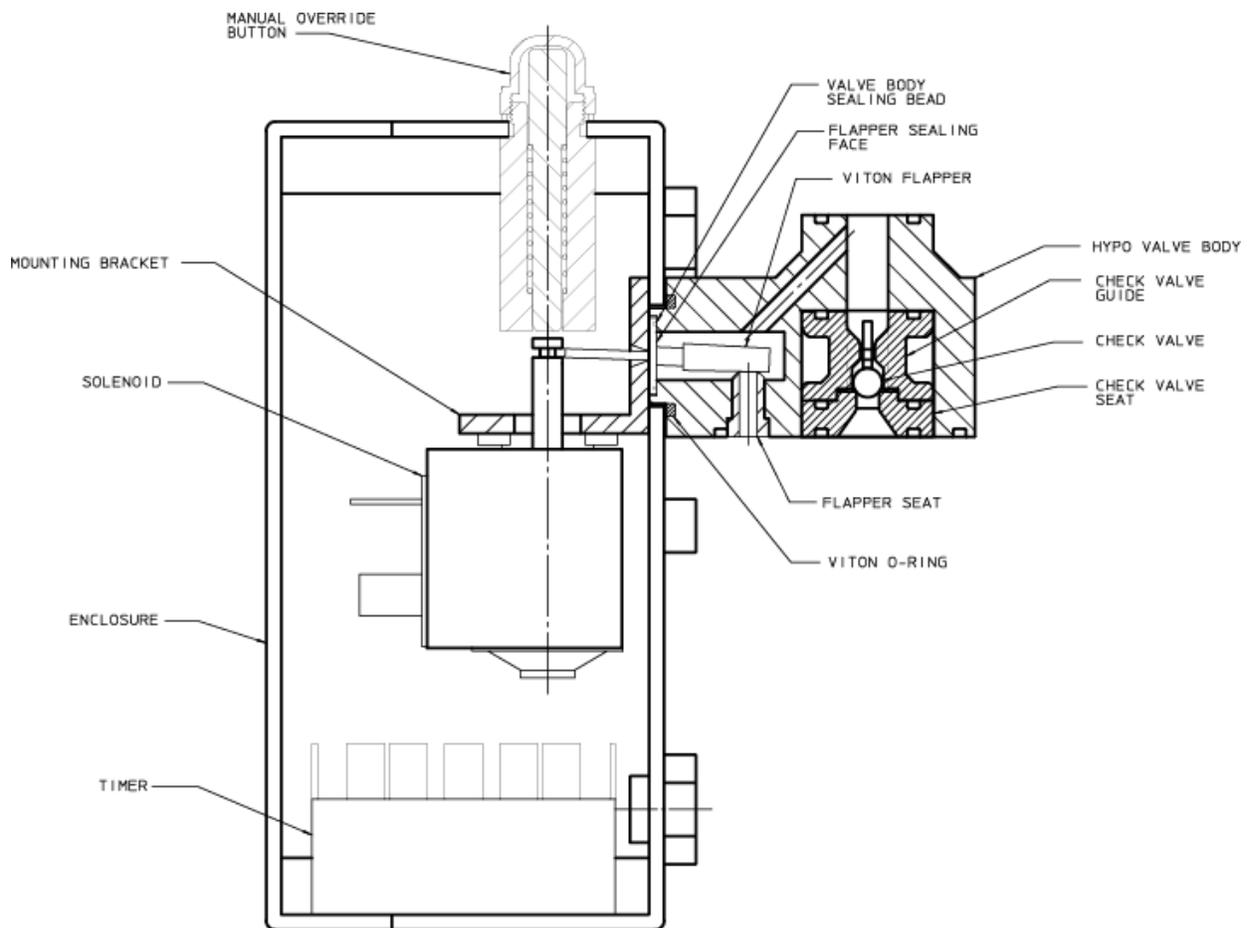


Figure 6

10. Wiring Diagrams

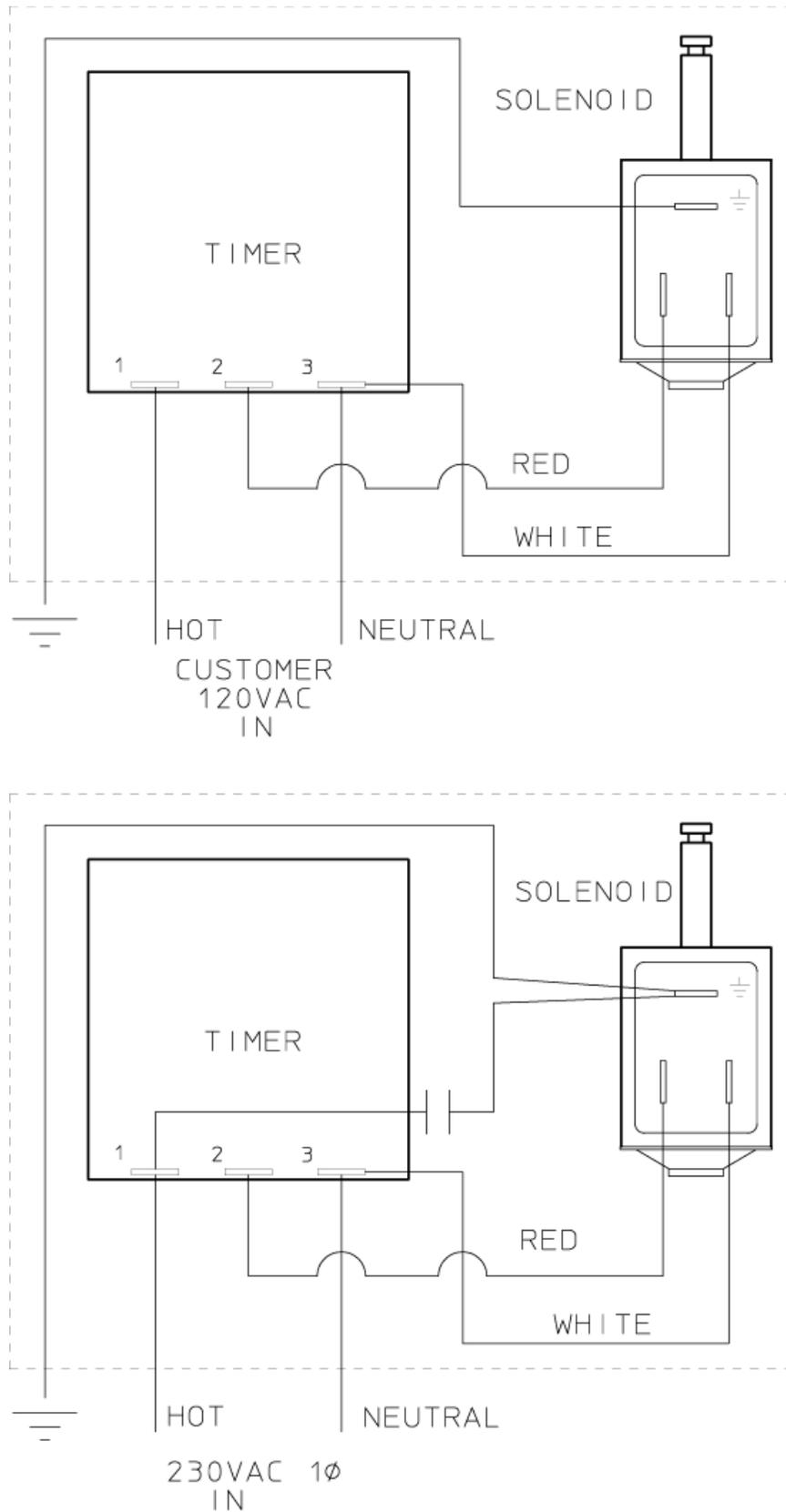


Figure 7

It is recommended that the AVA be powered from a Ground Fault Circuit Interrupter (GFCI) protected electrical circuit.

PULSAR[®] HYPOPUMP[®] **SODIUM HYPOCHLORITE METERING PUMP**

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