Series SLA

Electric Chemical Injection Pump

Plunger Type Head

Operating Manual

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This manual covers the installation and operation of CheckPoint Electric motor-driven pumps fitted with CheckPoint Series SLA drives and Series 1250 & 1500 chemical heads.

CAUTION:

1. **Do not operate pump without reading all the following information.**
2. **Follow all local rules, regulations, and safety requirements, and ensure that you are always wearing proper PPE.**
3. **Before troubleshooting the pump, ensure that power is disconnected from the pump according to site protocol.**
4. **The electric motor must be connected so that its direction of rotation is the same as the arrow on the gearbox. Motor polarity is important. The Series SLA plunger pump's input shaft must be turned counterclockwise to prevent premature failure.**
5. **Motors in horizontal orientation must be supported.**

1. PUMP DATA

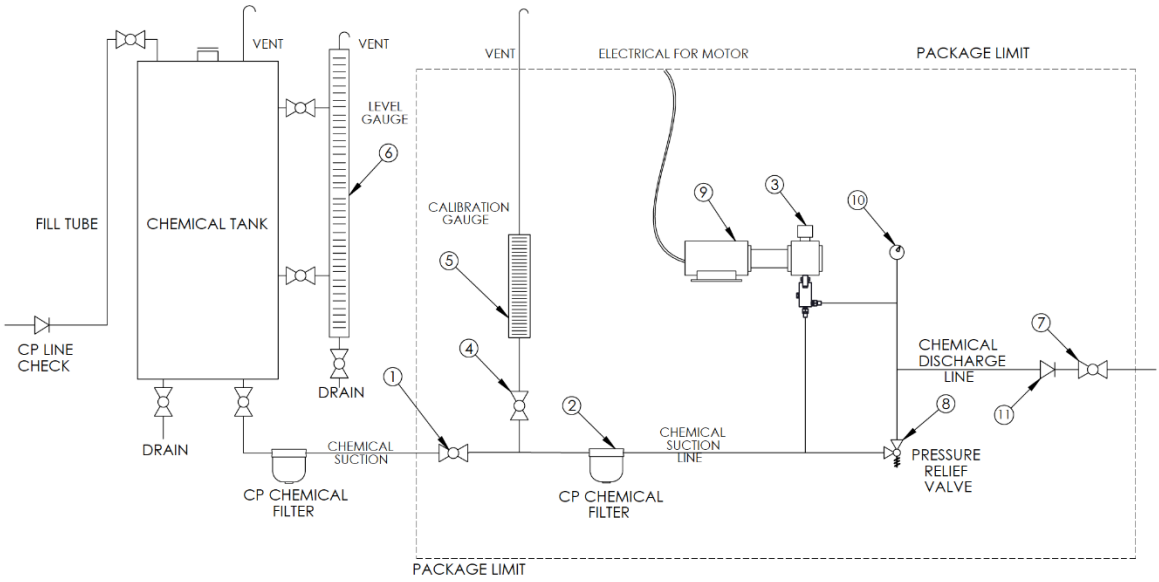
1.1 All information specific to the pump unit shipped with these instructions is contained in the Pump Datasheet attached to this Manual.

1.2 Refer to Figure 4 for location of referred components of this pump.

2. PUMP INSTALLATION

2.1 Prior to installing your injector, please inspect the pump carefully for any possible in-transit damage. If the pump appears damaged, call your authorized CheckPoint distributor, or call CheckPoint customer service directly at (800) 847-7867 or (504) 340-0770 to confirm damaged condition. If we determine that damage has occurred in transit, you will need to file a claim with the carrier.

FIGURE 1



CheckPoint packages are available for the Series SLA plunger pumps that contain all necessary components as indicated within the Package Limit Line. We can supply packages that contain ALL the components, including the tank, mounted on a single skid with or without full leak containment.

1. Suction Line Block Valve	4. Calibration Gauge Block Valve	7. Discharge Line Block Valve	10. Discharge Pressure Gauge
2. CP Chemical Filter*	5. CP Calibration Gauge*	8. PRV – Discharge Line	11. Discharge Check Valve
3. SLA Plunger Pump*	6. Tank Gauge	9. Motor	

All items in Figure 1 can be purchased from CheckPoint. Call today for our latest prices on pumps, gauges, packages and other components. *CheckPoint OEM products

2.2 Ensure that all necessary components are present in your injection system and in good working order. CheckPoint is available to answer your process questions or to help design and build a skid system utilizing components appropriate for your application.

CAUTION: THE PUMP MUST ALWAYS BE ORIENTED WITH THE DISCHARGE CHECK ON TOP AND THE SUCTION CHECK ON BOTTOM OR LOWER THAN THE DISCHARGE CHECK. MOUNTING THE PUMP IN ANOTHER ORIENTATION MAY CAUSE PREMATURE FAILURE OR OTHER PROBLEMS.

2.3 CheckPoint recommends the use of a calibration gauge for your assurance of proper pump function and chemical delivery rate. Refer to *Section 10: Setting and Adjusting the Pump Delivery Volume* for more information. The proper position of the calibration gauge see Figure 1, Item 5.

CAUTION: IT IS NECESSARY TO ATTACH A VENT TUBE TO THE TOP OF ALL CALIBRATION GAUGES, CHEMICAL TANKS, AND TANK LEVEL GAUGES. THE HEIGHT OF THE TOP OF EACH VENT TUBE SHOULD ALWAYS BE GREATER THAN THE HIGHEST POSSIBLE LIQUID LEVEL IN THE SYSTEM, AND THE TUBE SHOULD HAVE MEANS TO PREVENT WATER ENTRY, SUCH AS A 180-DEGREE BEND.

2.4 This pump does not require flooded suction or positive chemical pressure to prime and can therefore be mounted above the chemical container. While the pump is capable of pulling chemicals well below the pump inlet, it is best to have the chemical at or above the pump inlet. For applications pulling chemical from below the pump inlet, contact your CheckPoint-authorized dealer. This feature is dependent upon proper non-adjustable seal installation and adherence to all points made in Section 2.5 below.

2.5 All valves, fittings, and piping between the source of chemical and the pump's suction check valve must be 100% bubble-tight and fully compatible with the chemical being delivered and with each other. Failure to adhere strictly to this rule will lead to gas build-up in the chemical head and loss of prime.

Specifically:

2.5.1 Any fitting or screw-on joint without Teflon™ tape or other acceptable joint sealant may allow air at atmospheric pressure to enter the suction tubing, even if no chemical leakage is visible.

2.5.2 Dissimilar metals, when joined together in the suction pipe work may react with each other, creating gas bubbles that will end up being carried into the pump head. CheckPoint generally recommends all suction components, including all tubing, piping, fittings, and valves, be of similar material, preferably stainless steel or other chemically resistant metal.

2.5.3 Incompatibilities between the chemical and the metallic elements in the suction pipe work can also create such gas bubbles. In particular, some acids require Hastelloy™ or PVC fittings and tubing, while other chemicals may only require 316 SS.

2.6 Always check to ensure that all process block valves are closed prior to disconnecting or re-installing any chemical injection pump. There should always be a block valve placed between a properly installed pump and the process flow and the chemical supply. Conversely, while the pump is running, all such block valves should always be open.

2.7 To ensure sufficient flow rates of chemical and minimize pressure drop through the lines, all suction lines should be equal to or greater than the suction check valve size; this will differ based on plunger size. All discharge lines should be equal to or greater than the discharge check valve size; this will also differ based on plunger size. Additional allowances are required for multiple pump installations and for the use of viscous chemicals. Contact CheckPoint or your authorized CheckPoint distributor for design assistance. Pulsation dampeners are sometimes specified in systems utilizing low-flow pumps. Because the low flow rates of all Series SLA plunger pumps do not generate harmful pulsation, pulsation dampeners are not required.

3. PRIOR TO STARTUP – SAFETY CHECKS

3.1 Is the gearbox filled with suitable lubricant?

3.2 Is the power supply correctly matched to the motor?

3.3 Is the electric hookup of the pump correct and carried out according to all applicable codes?

3.4 Are all tubing/pipe connections made up correctly?

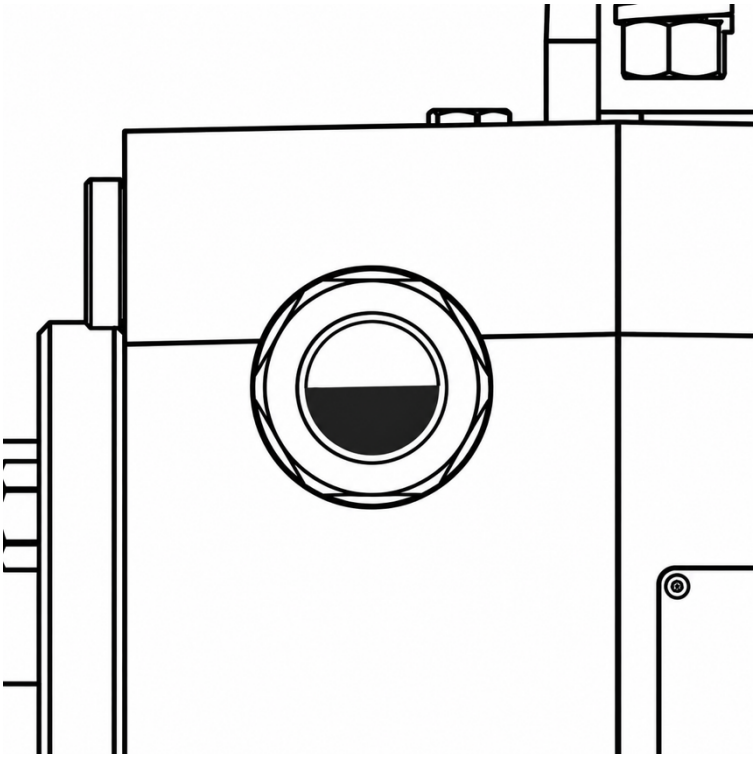
3.5 Is there a pressure relief valve on the discharge side?

3.6 Is the pressure relief valve operating correctly, and is the correct pressure set?

4. CHECKING THE GEAR LUBRICANT LEVEL

CAUTION: TO AVOID RISK OF DAMAGE AND OVERHEATING, the pump gearbox must be filled with gear lubricant at all times when operating the pump.

FIGURE 2



4.1 Oil level should be checked weekly.

4.2 Oil level may be checked while pump is running.

4.3 Check the sight glass. The oil should be filled at a minimum 25% up the sight glass.

4.4 NOTE: When pump is stroking, the glass will appear full but never look empty. If fluid is coming out of the vent cap, pump is overfilled.

4.5 If the oil is below the 25% level on the sight glass, stop the pump, remove the vent cap and fill up to 50% level. Refit and tighten the vent cap.

5. GEAR LUBRICANT TYPE

5.1 Use Mobil SHC 634 or ISO VG 460 oil; it must not contain any EP additives.

5.2 Capacity of unit is 2.1 Quarts / 2.0 L.

NOTE: New pumps experience a break-in period. Temperatures will rise and eventually fall, typically within a few hours.

5.3 **Maintenance period**

5.3.1 If temperature exceeds 180°F (82°C) during break-in period, we recommend replacing the oil once the temperature levels out. If temperature remains below 180°F (82°C), refer to section 5.3.2.

5.3.2 Oil should be changed after 1 month (800 hours) for the first-time break-in or run-in period, and every 6 months (4,400 hours) thereafter.

CAUTION: DO NOT DRAIN HOT LUBRICANT. EXPOSURE TO HOT LUBRICANT CAN CAUSE SIGNIFICANT BURNS.

NOTE: Assure environmentally safe draining and disposal of spent lubricants.

6. MOTOR ELECTRICAL CONNECTION

6.1 The electric motor must be connected so that its direction of rotation is the same as the arrow on the gearbox.

6.2 The electric motor must be connected in accordance with all local regulations, including requirements for overload protection.

6.3 The complete installation must be equipped with an “emergency off” switch that is easily and quickly accessible by the user.

7. PRESSURE RELIEF VALVE (PRV)

CAUTION: NEVER OPERATE PUMP WITHOUT A PRESSURE RELIEF VALVE (PRV) ON THE DISCHARGE SIDE OF THE PUMP THAT HAS BEEN SET TO THE APPROPRIATE OVERLOAD PRESSURE! OPERATING PUMP WITHOUT A PRV MAY CAUSE DAMAGE TO THE DRIVE AND/OR CAUSE A LEAK HAZARD!

NOTE: When using a pressure relief valve vented to the chemical tank the vessel MUST BE properly vented to the atmosphere to avoid the possibility of over-pressurizing the tank.

7.1 PRV set pressures are 20% above max pump pressure as per datasheet, unless specific customer requires otherwise.

8. CONNECTING THE CHEMICAL SUPPLY

8.1 Clean suction lines and check chemical containers to ensure that they are free of all foreign matter, sand, sludge, or chemical buildup.

CAUTION: REMOVING FOREIGN DEBRIS FROM SUCTION LINES AND CHEMICAL CONTAINERS WILL SUBSTANTIALLY EXTEND THE LIFE OF THE NON-ADJUSTABLE SEAL AND OTHER COMPONENTS OF THE PUMP. EVEN A NEW CHEMICAL TANK CAN CONTAIN DEBRIS THAT CAN BE CARRIED INTO THE PUMP AND DAMAGE IT.

NOTE: If premature scoring of the pump plunger or early non-adjustable seal failure is observed during operation, a likely cause is abrasive particles carried into the pump through the suction plumbing. Use of a pre-suction in-line chemical filter such as the CheckPoint Series ST Chemical Filter and/or a ceramic or Hastelloy™ plunger is recommended.

CAUTION: SUBSTANTIAL PLUNGER SCORING CAN LEAD TO SEVERE LEAKAGE OF CHEMICALS INTO THE ENVIRONMENT.

8.2 Connect the chemical suction line to the suction check valve on the pump head. The suction check valve has a ½" NPT male thread for Series 1500 3/8" through 1" heads and a ¾" NPT male thread for Series 1500 1-1/2" heads, with an arrow indicating chemical flow direction towards the pump (see Figure 4). The Series 1250 head will have ¼" NPT male heads.

NOTE: Always apply Teflon™ tape or other appropriate thread sealant to the check valve threads prior to attachment to prevent leakage.

CAUTION: NEVER RELOCATE THE SUCTION OR DISCHARGE CHECK VALVES AWAY FROM THE CHEMICAL HEAD. TO OPERATE PROPERLY, CHECK VALVES MUST REMAIN DIRECTLY ATTACHED TO THE CHEMICAL HEAD. IF DESIRED, A SECONDARY DISCHARGE CHECK MAY BE PLACED DOWNSTREAM OF THE PRIMARY DISCHARGE CHECK VALVE.

8.2.1 Connect your discharge line to the discharge check valve. This is a ½" NPT male thread on for Series 1500 3/8" to 1" heads and a ¾" NPT male thread for the Series 1500 1-1/2" head. An arrow is stamped on the discharge check valve pointing away from the pump. The series 1250 head will have ¼" NPT male heads.

8.2.2 Open the process block valve to allow the process pressure to reach the chemical head. Correct any leakage observed.

9. BLEEDING/PRIMING THE PUMP

9.1 The bleed screw (Figure 4, item 4), if equipped, is fitted with a 1/8" NPT female connector to allow the user to tube chemical used in the bleeding process to a safe area.

9.1.1 Prior to bleeding air from the pump head, check to ensure that the gland nut is tightened.

9.1.2 Open the chemical supply block valve.

9.1.3 Open the process block valve.

CAUTION: OTHER THAN DURING BRIEF TESTING, NEVER OPERATE THE PUMP WITHOUT CHEMICAL SUPPLY AVAILABLE AND FLOWING FREELY. DOING SO WILL CREATE UNDUE FRICTION AND HEAT, DECREASING THE LIFE OF THE NON-ADJUSTABLE SEAL, HASTENING CHEMICAL LEAKAGE, AND VOIDING THE PUMP WARRANTY.

9.2 Start the pump.

9.3 Adjust the stroke length to maximum using stroke length adjuster (Figure 4, Item 7).

9.4 Open the bleed screw 1-1/2 to 2 turns. The pump will begin to pull air and chemical through the chemical supply plumbing, into the head, and out the port in the bleed valve. Leave the valve open until a solid stream of chemical pumps out the bleed port with each stroke of the pump.

NOTE: If the pump is not new, it is very possible for dried or solidified chemical to be present in the bleed assembly. If your pump does not bleed when following the directions above, try cleaning these items in solvent and replacing them.

9.5 Close the bleed screw until chemical flow through the bleed port stops.

CAUTION: DO NOT OVER-TIGHTEN THE BLEED SCREW. TIGHTEN THE BLEED SCREW ONLY UNTIL CHEMICAL STOPS FLOWING. APPLYING EXCESS TORQUE TO THE BLEED VALVE MAY IMPAIR FUTURE VALVE OPERATION.

NOTE: Occasionally, soon after closing the bleed assembly, you may observe leakage. If so, this is usually due to a loose gland nut.

9.6 Adjust the stroke length to obtain proper delivery volume per directions in Section 10 below.

10. SETTING AND ADJUSTING THE PUMP DELIVERY VOLUME

10.1 The pump stroke rate remains constant regardless of delivery volume.

10.2 The pump delivery volume is adjusted by changing the stroke length.

10.3 The large black dial (Figure 4, Item 7) is used to adjust the stroke length of the pump.

10.4 Stroke length is adjustable from 0-1"(0%-100%). Full stroke=100%

10.5 The stroke length may be adjusted while the pump is running.

10.6 There are a variety of calibration gauges available, including a complete line of appropriately sized CheckPoint calibration gauges for every CheckPoint pump. To ensure that your pump is working as it should and that chemical is being delivered at the rate you need, it is important to use a calibration gauge.

10.7 Most calibration gauges are designed to read properly when one full minute of pumping has taken

place. If the liquid level drops too fast to allow for a full minute, shorter periods are acceptable. Try to size the gauge so that at least a 30 second test can be made, or a loss of accuracy will result.

10.8 Proper gauge placement and plumbing are important. Please refer to Figure 1 for appropriate valving and placement, and for reference numbers as used in this section. The calibration gauge is labeled as Item 5 in Figure 1.

10.9 With the pump either running or stopped, open the Gauge Fill Valve (Figure 1, Item 4). The calibration gauge (Figure 1, Item 5) should begin to fill. Continue filling until the chemical level is at or near the top markings on the gauge, then close the Gauge Fill Valve (Figure 1, Item 4).

10.10 Now ensure that the CheckPoint pump is running. Take note of the level of chemical in the gauge using the appropriate scale for the volume units you want to measure the pump's output in. Usually, the calibration gauge will show liters on one scale and quarts or gallons on the other. It is best to write down the number so that you can calculate flow accurately.

10.11 Open the Gauge Fill Valve (Figure 1, Item 4) and start a timer. Immediately close the Chemical Supply Valve (Figure 1, Item 1). This isolates the pump and gauge so that the pump is supplied directly from the gauge.

10.12 The level in the gauge should begin to fall. When the liquid level in the gauge gets near the bottom of the gauge, or when one minute has expired (whichever comes first), stop timing, note the ending level on the gauge, and reopen the Chemical Supply Valve (Figure 1, Item 1).

10.13 Write down the amount of time in seconds and the final gauge reading, then close the Gauge Fill Valve (Figure 1, Item 4).

NOTE: Failure to reopen the Chemical Supply Valve will result in the pump quickly depleting the remaining chemical in the gauge and sucking in air from the gauge, necessitating pump re- priming.

NOTE: In cases where the chemical flow rate is extremely low, you may need to time for longer than one minute to allow an adequate amount of chemical to move out of the gauge.

10.14 The pumping volume (in the units specified on the gauge scale) is given by the following equation:

$$\textbf{PUMPING VOLUME} = \frac{\text{[END READING] – [BEGINNING READING]}}{\text{[DURATION OF READING IN SECONDS]}} \times 60$$

NOTE: To ensure accurate flow rate measurement, allow sufficient measurement duration. Where possible, allow at least thirty seconds of gauge drawdown.

11. NON-ADJUSTABLE SEAL REPLACEMENT

Follow the steps below to change the non-adjustable seal in your pump.

NOTE: The ½" and ¾" plunger sizes (Series 1500) and the 3/16" and 1/4" plunger sizes (Series 1250) require a metal adapter sleeve in the non-adjustable seal gland. When removing the non-adjustable seal, this sleeve should also be removed and cleaned. It is important to remember to reinstall the sleeve prior to installing the new non-adjustable seal. The ½" and ¾" plunger sizes (Series 1500) and the 3/16" (Series 1250) pump require an O-ring and a backup ring.

11.1 Shut off power to the pump.

11.2 Remove pump from service.

11.3 Close the block valves on the chemical supply and discharge.

11.4 Disconnect the chemical supply from the pump at the suction check valve, and disconnect the discharge line from the discharge check.

11.5 Remove the chemical head by removing the two head bolts and then separating the head component from the body of the pump.

11.6 Unscrew and remove the gland nut, using 1/4" tubing or a gland nut tool. A gland nut tool is available at no charge from CheckPoint.

11.7 Remove the suction check valve from the head.

11.8 Using the access hole where the suction check was, push out the non-adjustable seal and sleeve with a punch or screwdriver. For the 3/8", 1", and 1-1/2" Series 1500 head, proceed to step 11.11

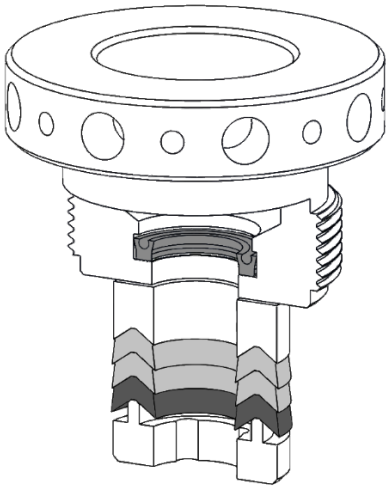
11.9 Remove the non-adjustable seal from the sleeve, along with the O-ring and backup ring on the small outside diameter of the sleeve. Clean the sleeve and lightly grease it, then install the new O-ring and backup ring supplied with your new non-adjustable seal. If you cannot locate these parts, please contact CheckPoint for replacements.

NOTE: Grease should be a premium quality multi-purpose, lithium-based NLGI No 2 grease recommended for general industrial applications which meets or exceeds the requirements of DIN 51825: (2004-06) 2K-30. Avoid products containing Xylene.

11.10 Grease and replace the metal sleeve. Refer to the drawings on our website for proper orientation of sleeve. No sleeve is present on 3/8", 1" and 1-1/2" plunger diameter models.

11.11 Examine the new non-adjustable seal closely and ensure, prior to installation, that it is oriented properly according to Figure 3. Your non-adjustable seal will be similar to the cross-sectional view shown.

FIGURE 3



NOTE: When replacing a non-adjustable seal, always install the vee-rings exactly as they are shipped. Rearranging the order of the vee-rings in a non-adjustable seal set will reduce the life of the elastomer ring in the non-adjustable seal set.

11.12 Grease the vee-rings on their outside diameters lightly and install them, one ring at a time. It is important to adhere to the ring order and orientation as shown in the diagram.

NOTE: On the 1/2" and 3/4" plunger (Series 1500) and the 3/16" (Series 1250) models, the non-adjustable seal fits inside the sleeve rather than directly into the gland.

11.13 Grease the gland nut threads and replace the nut loosely by hand.

11.14 Grease the plunger rod protruding from the pump drive.

11.15 Taking care to insert the plunger into the non-adjustable seal without damaging or bending it, replace the chemical head onto the main body of the pump.

11.16 Grease the threads on the two head bolts, then insert and hand-tighten them.

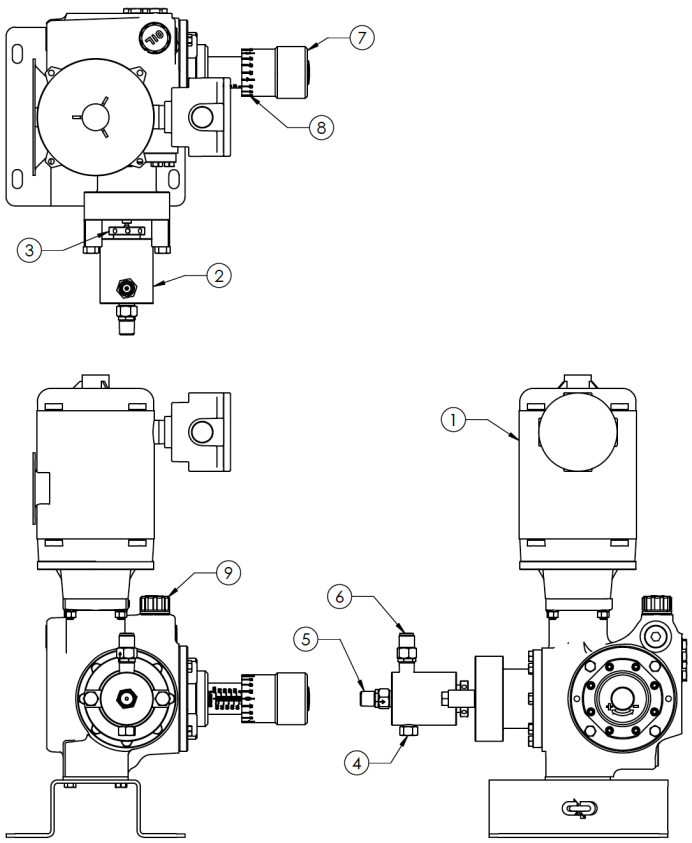
11.17 Tighten the gland nut to the point where the gland nut adjuster will no longer move the gland nut.

11.18 Fully tighten down the head bolts. Failure to adhere to this procedure can lead to a misaligned head and leaking.

11.19 Reattach all process lines to the chemical head, and open all isolation valves leading to the pump chemical supply and discharge.

12. NAME & FUNCTION DIAGRAM

FIGURE 4

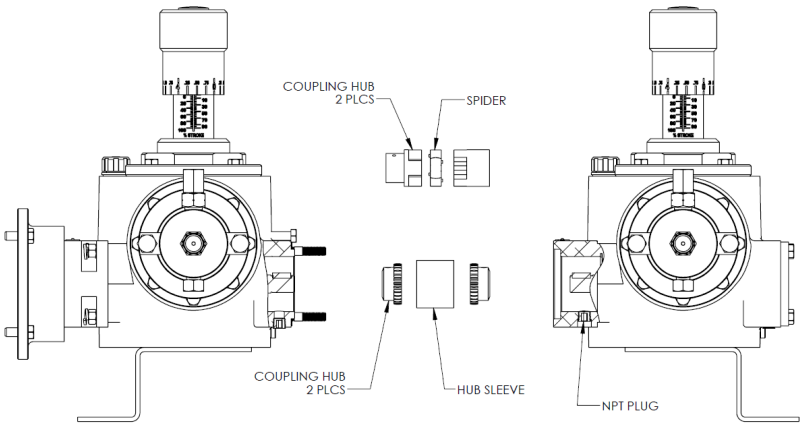


1. Electric Motor	4. Bleed Screw	7. Stroke Length Adjuster
2. Plunger-Type Chemical Head	5. Suction Check Valve	8. Stroke Length Adjustment Setting
3. Gland Nut	6. Discharge Check Valve	9. Oil Level /Fill Plug

13. MULTIPLE DRIVE INSTALLATION – COUPLING

13.1 Multiple SLA drives may be mechanically connected using a coupling as shown in Figure 5

FIGURE 5



13.2 CAUTION: Proper installation and alignment of the coupling is required to prevent premature coupling, shaft, bearing, or drive damage.

13.3 Multiple Drive Phasing

13.4 When multiple SLA drives are connected, the rotational phase of each drive must be established before the coupling is engaged. This phasing will vary depending on the number of SLA units attached.

13.5 For proper SLA drive phasing, adjust all stroke lengths to 100% and rotate input shafts so all plungers are at the full stroke length (fully extended). Use the applicable 15:1 or 9:1 SLA phasing table below to adjust each input shaft to the required position.

15:1 SLA	
Number of Pumps	Number of Turns at each Pump
2	P2=7.5 Turns
3	P2=5 Turns, P3=10 Turns
4	P2=3.75 Turns, P3=7.5 Turns, P4=11.25 Turns
5	P2=3 Turns, P3=6 Turns, P4=9 Turns, P5=12 Turns
6	P2=2.5 Turns, P3=5 Turns, P4=7.5 Turns, P5=10 Turns, P6=12.5 Turns
9:1 SLA	
2	P2=4.5 Turns
3	P2=3 Turns, P3=6 Turns
4	P2=2.25 Turns, P3=4.5 Turns, P4=6.75 Turns
5	P2=1.8 Turns, P3=3.6 Turns, P4=5.4 Turns, P5=7.2 Turns
6	P2=1.5 Turns, P3=3 Turns, P4=4.5 Turns, P5=6 Turns, P6=7.5 Turns

NOTE: Pump#1(P1) is attached to the motor, and each subsequent pump is the next pump number. All turns noted are clockwise when adjusting the "motor side" of the input shaft. Starting at Pump#2 (P2), rotate the shaft the correct number of turns based off the tables above. Repeat for every remaining pump. Do not rotate an individual drive after the drives have been phased and coupled unless the phasing procedure is repeated.

13.6 **Coupling Installation**

13.6.1 Position the SLA drives so that the drive shafts are aligned with each other.

13.6.2 Verify that the shaft keys are properly installed and fully seated in their respective keyways.

13.6.3 Install the coupling hubs onto the respective pump shafts.

13.6.4 Position the coupling hubs so that the required coupling engagement and hub spacing are maintained.

13.6.5 Install the elastomer spider or hub sleeve between the two coupling hubs.

13.6.6 Note: The coupling type may differ depending on head configuration.

13.6.7 Carefully bring the two SLA drives together until the coupling is fully engaged.

13.6.8 Secure both SLA drives to the mounting surface and verify that the drive shafts remain properly aligned.

13.6.9 Tighten the coupling via 2.5mm Allen Wrench

13.6.10 Before installing the motor or applying power, manually rotate the connected drive assembly to verify that all pump shafts rotate freely without binding or interference.

13.6.11 Observe the timing of the plungers to verify that they all pump in the correct sequence.

13.6.12 Re-install NPT plug at the bottom of the housing under the input shaft.

14. TROUBLESHOOTING

14.1 **Oil leak** If you have any type of oil leak from a seal or an O-ring, disconnect power, and check the fasteners at that location. If everything is properly sealed, check the vent cap to be sure that the vent is not clogged with debris. Dirt and dust can clog the vent cap causing pressure to build up. Check the oil level to be sure that the oil is not overfilled. Contact CheckPoint if problem is not resolved.

14.2 **Heat level increase** If the pump reaches a temperature exceeding 110°F (61°C) over ambient, first check the oil level. If the oil is properly filled, check the motor amp draw. If the motor amp draw is correct, then check the discharge pressure.

14.3 **Stroke-length adjustment has no effect** Remove the black cover to make sure that the internal nut has not loosened. If the nut has loosened, retighten it.

14.4 **Motor is running, but there is no plunger movement and adjuster knob is not providing adjustment** Inside of the motor are a coupling with a plastic portion, a shaft keyway, and a worm keyway, any of which could potentially have sheared due to process malfunction causing excessive pressure. If the motor is running but there is no plunger movement, pull the motor off and check the coupling and keyways. If this shear occurs, contact CheckPoint.

14.5 **Pump runs, but chemical does not discharge at the correct rate** Refer below for possible solutions.

14.5.1 **Suction check valve may be clogged with debris** To flush, allow the pump to cycle at maximum rate for at least 60 seconds. If no improvement is noted, remove the suction check valve from body of pump. Blow the check out with air or water pressure. If the first attempts are unsuccessful, a check rebuild could be necessary.

NOTE: CheckPoint check valves do not need replacement when they do not check properly. A simple rebuild kit is available to replace the O-rings, which corrects all but the most severe check problems. Corrosion of the valve seat, retainer, or poppet indicates an incorrect check valve material. Please contact CheckPoint to request chemical compatibility information.

NOTE: Always replace Teflon™ tape or other appropriate thread sealant on check valve threads during reinstallation to avoid chemical leakage or the introduction of air to the chemical head.

14.5.2 **Pump may have lost prime and became air-locked** Check to ensure that there are no leaks in any process lines, particularly upstream of the pump, within the chemical suction lines. If air is introduced through the suction side, the pump may lose prime. Read Section 2.5 and its subparagraphs carefully for details. A common source of air in the supply is the block valve ahead of the suction check. Check this valve to make sure that the stem packing is tight and that the materials of construction are compatible with the chemical being pumped. Also, check that the pump's packing is not leaking. Finally, with pumps supplying chemical into gas lines, it is possible that the discharge port may be leaking. A leaky discharge port may allow gas under pressure to "back into" the chemical head.

14.5.3 **Check valves may have been relocated away from the chemical head of the pump** The checks must stay directly attached to the head in order to facilitate chemical movement.

14.5.4 **Chemical may be obstructed from entering the pump** Pumping upstream of the chemical head may allow a blockage which prevents chemical from getting to the suction check valve. A common example is an in-line chemical filter becoming clogged with debris. Solution - clean out suction plumbing and clean or replace the chemical filter.

14.5.5 **Chemical supply line size or configuration may cause NPSHa to drop below NPSHr**. Make sure you use adequately sized tubing to avoid this problem.

14.5.6 **The calibration gauge may be reading incorrectly due to a clogged air vent**. If the calibration gauge is not reading correctly, it may appear chemical is not getting into the process. Check for an obstruction in the gauge or in the air vent atop the gauge.

14.6 **MISCELLANEOUS**

14.6.1 If you are experiencing an operating problem not listed above, or if none of the above troubleshooting actions solve your operating problem, please contact your Authorized CheckPoint Distributor, or contact CheckPoint directly at +1 (504) 340-0770, toll free at + 1 (800) 847-7867, or via email at HELP@cppumps.com. We will work to assist you in determining the appropriate next steps. Once CheckPoint has had the opportunity to assist you with troubleshooting your problem, please keep in mind the following information regarding repairs.

14.6.2 CheckPoint offers exchange programs to keep you in service. CheckPoint will ship you a rebuilt pump, which you will be able to install prior to sending us your existing pump. Upon receipt of your pump, we will tear it down, rebuild it, and report to you our findings. Please contact CheckPoint headquarters to learn more about our exchange services.

14.6.3 Although the Series SLA plunger pump has been designed for easy operation and repair, the best way to ensure continued reliable service is to have your pump repaired by CheckPoint's factory. OEM repair services ensure CheckPoint quality and reliability.

14.6.4 After your CheckPoint pump has been repaired, it will perform like new.

14.6.5 If your pump is anything less than exceptional, call us to determine what can be done to restore the pump to "like-new" performance.

14.6.6 Training sessions are available. CheckPoint strives to maintain excellence in all that we do, and we are happy to share our knowledge with you. If you would like to train your employees regarding anything involving CheckPoint Pumps & Systems, please contact us to discuss training options.