

# Liquid End **Sheet**

## LE - 350 Series / 0.5 (IN<sup>2</sup>)

When pumping solutions, make certain that all tubing is securely attached to the fittings. It is recommended that tubing or pipe lines be shielded to prevent possible injury in case of rupture or accidental damage. Always wear protective clothing and face shield when working on or near your metering pump.

**Note: See parts list for materials of construction**

### A. INSTALLING INJECTION CHECK VALVE

1. The purpose of the injection check valve is to prevent backflow from the treated line.
2. A 1/2" NPT female fitting with sufficient depth will accept the injection check valve.
3. To insure correct seating of the ball inside the injection check valve, the injection check valve should be installed upwards (vertically) into bottom of the pipe.

### B. CONNECTING DISCHARGE TUBING

**Note:** *Cut tubing to length needed for discharge line.*

1. Route tubing from the injection check valve to the metering pump, making sure it does not touch hot or sharp surfaces, or is bent so sharply that it kinks.
2. Slide the small end of the coupling nut onto tubing.
3. Slide the long, straight end of the ferrule onto tubing such that tubing exits at the cone shaped end of the ferrule.
4. Insert tubing so that it butts up against the valve housing and will not go any further.
5. Slide ferrule down so that the cone shaped end fits snugly into valve housing.
6. Slide the coupling nut to the threads and engage. While pushing the tubing into valve housing, tighten the coupling nut by hand until tubing is held securely in place.

**Excessive force will crack or distort fittings.  
DO NOT USE PIPE WRENCH.**

### C. CONNECTING SUCTION TUBING

1. Cut suction tubing to a length so that the foot valve hangs just above the bottom of the solution container. Maximum recommended vertical suction lift is 5 ft (1.5 m).
2. Follow same procedure in connecting suction tubing to suction valve and foot valve (see **B. Connecting Discharge Tubing**).

### D. PRIMING with 3FV / 4FV (see page 4 for B/4FV)

1. Connect pressure relief tubing to pressure relief port on the discharge valve.
2. Route tubing to solution reservoir and anchor with a plastic tie. Do not submerge tubing in solution.
3. Start pump. Set at 80% speed and 100% stroke.
4. Turn Pressure Relief knob (black knob) 1/4 turn. Let pump run until solution is visible through translucent return tubing.
5. Turn Pressure Relief knob back 1/4 turn. The pump is now primed.

#### **Note:**

- (a) *Pump is normally self-priming if suction lift is not more than 5 ft (1.5 m), valves in the pump are wet with water (pump is shipped from factory with water in pump head) and the above steps (D. Priming) are followed.*
- (b) *If the pump does not self prime, remove cartridge valve and pour water or solution slowly into discharge port until head is filled. Follow step D. Priming thereafter.*

### E. DEPRESSURIZING DISCHARGE LINE

1. It is possible to depressurize the discharge line and pump head without removal of tubing or loosening of fittings.

*Be sure injection check valve is properly installed and is operating. If a gate valve or globe valve has been installed downstream of injection check valve, it should be closed. Be certain relief tubing from the four function valve is connected and run to solution reservoir.*

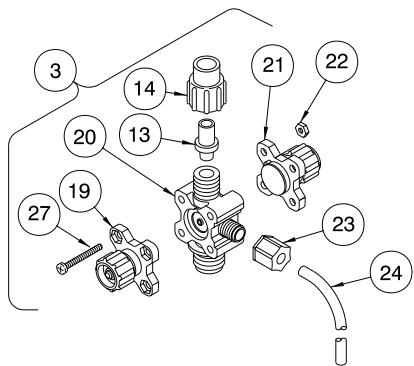
2. Turn Pressure Relief knob 1/4 turn.
3. The discharge line is now depressurized.
4. If injection check valve is of higher elevation than pump head, disconnecting tubing at injection check valve end will allow air to enter and cause solution to drain back to tank.



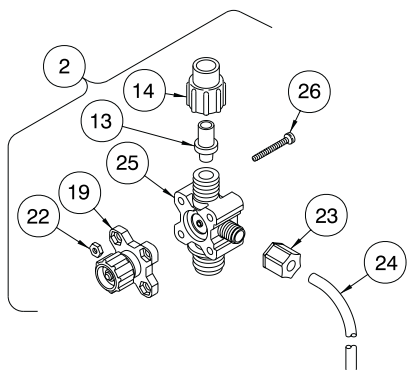
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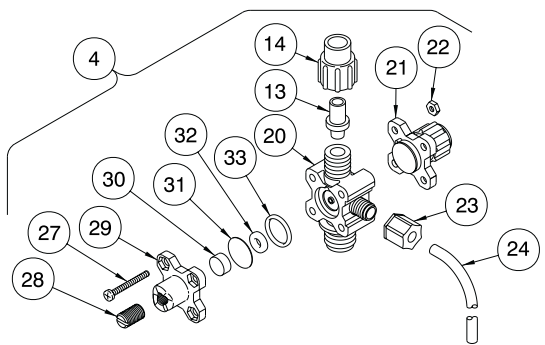




4-FUNCTION VALVE (4FV)

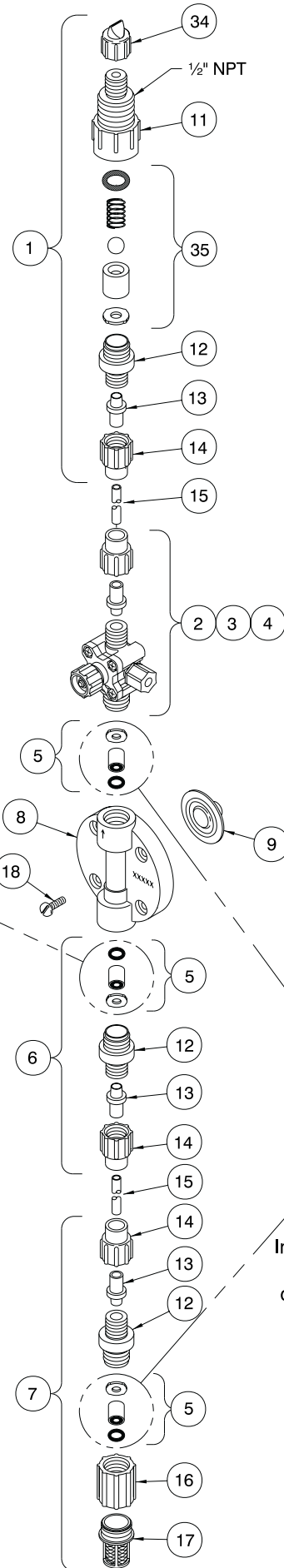
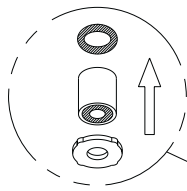


3-FUNCTION VALVE (3FV)

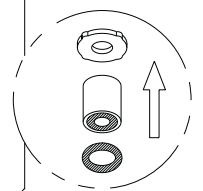


4-FUNCTION BLEED VALVE (B-4FV)

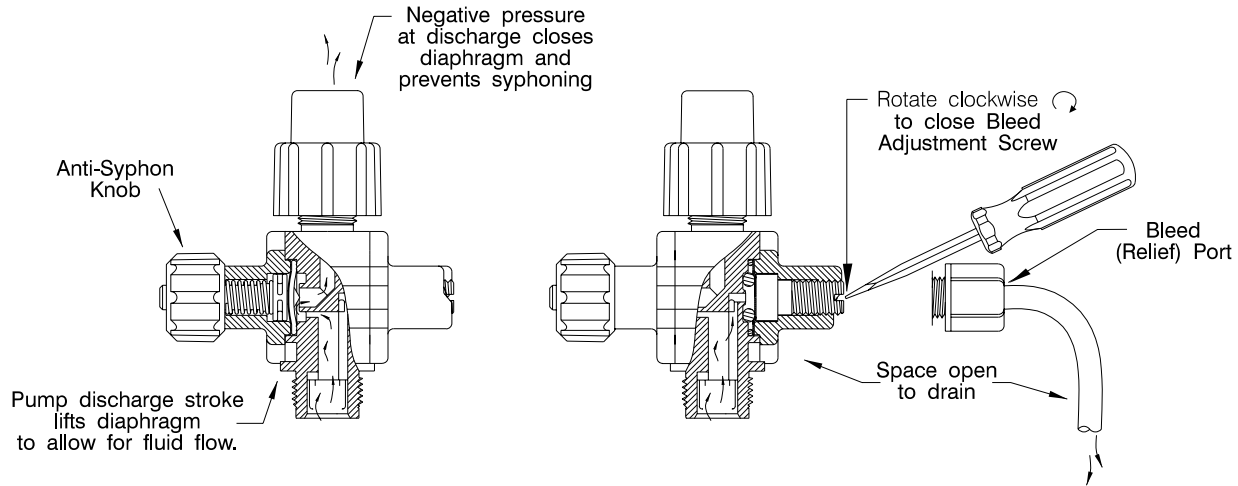
**Washer on Bottom**  
Install 3-piece cartridge valve as shown in direction of flow arrow




**Washer on Top**  
Install 3-piece cartridge valve as shown in direction of flow arrow



## METHOD OF OPERATION




### A. PRIMING with B/4FV (see page 1 for 3FV / 4FV)


1. Connect bleed return tubing to bleed (relief) port.
2. Route tubing to solution tank. Be sure the end of tubing is above the maximum solution level. (Do not submerge tubing in solution.)
3. Set pump at 80% speed and 100% stroke. Start pump. With screwdriver rotate bleed adjustment screw counter-clockwise  two (2) full turns. When solution begins to flow through translucent bleed return tubing, the pump is primed.
4. Stop pump.

#### Note:

- (a) Pump is normally self-priming if suction lift is no more than 5 ft (1.5 m), valves in the pump are wet with water (pump is shipped from factory with water in pump head) and the above steps (A1 thru A3) are followed.
- (b) If the pump does not self prime, remove Bleed/4-Function Valve and Discharge Cartridge, and pour water or solution slowly into discharge port until it is filled. Replace Cartridge, and follow steps A1 thru A3 thereafter.

### B. BLEED ADJUSTMENT


1. Start pump and let pump inject solution into the discharge line.
2. Close the bleed adjustment screw by rotating it clockwise  with a screwdriver.

3. Now adjust the pump stroke length and/or speed (frequency) to a range approximately 25% higher than you would normally want for the process.
4. Slowly rotate bleed adjustment screw counter-clockwise  until just a small amount of solution begins to trickle down inside the bleed return tubing. A small amount of solution pumped back to the tank with each stroke of the pump will allow gas and air to escape without air or gas locking in the pump head.

### C. DEPRESSURIZING DISCHARGE LINE

1. It is possible to depressurize discharge line and pump head without removal of tubing or loosening of fittings.

*Be sure injection check valve is properly installed and is operating. If a gate valve or globe valve has been installed, downstream of injection check valve, it should be closed. Be certain bleed return tubing is connected and run to solution supply tank.*

2. With a screwdriver, rotate bleed adjustment screw counter-clockwise  two (2) full turns. A small amount of solution in discharge line should drain back to the supply tank.
3. The discharge line is now depressurized.
4. If injection check valve is of higher elevation than pump head, disconnecting tubing at injection check valve end will allow air to enter and cause solution to drain back to tank.



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