

### Operating Principles

When the Solinst Micro Double Valve Pump (DVP) is placed in a well or borehole, water rises inside the pump and up the concentric tubes to static level. A Control Unit is used to supply compressed gas or air to the pump on the drive cycle. The gas pushes down on the water column contained in the outer, 3/8" dia. tubing (drive line), closing the check valve at the base of the pump. This forces the water up the inner 3/16" dia. sample line tubing.

A vent cycle, during which the gas is released, allows water to refill the pump and drive line (outer tubing). The top check valve prevents water in the sample line from falling back into the pump body. This drive and vent cycle is repeated manually or automatically as set by the timers on the control unit. The cycle may be regulated for purging or sampling.

**Note:** The pump has been cleaned before leaving Solinst, however, if you wish to decontaminate your pump before use, follow the decontamination procedure overleaf.

### Purging/Sampling Setup

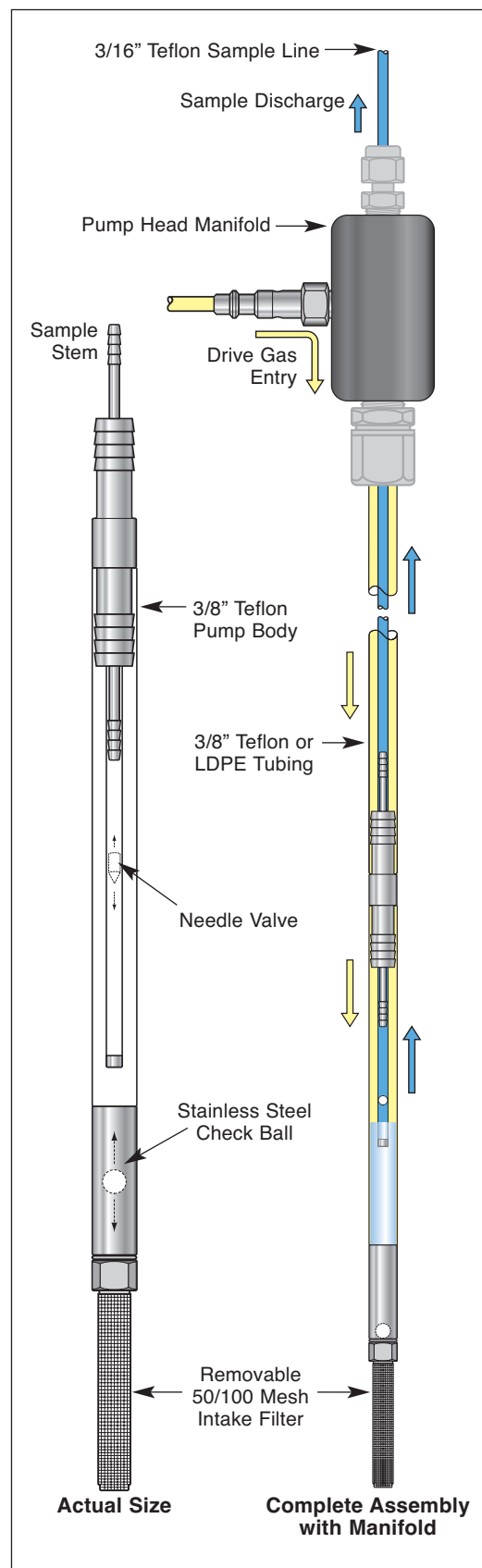
1. When using the Solinst Model 466 Electronic Control Unit, connect the "Air Out" line to the quick connect fitting on the side of the Delrin pump head manifold.
2. This feeds air or nitrogen to the drive line, which is the larger diameter tubing.
3. The smaller inner tube is the sample line.

### Taking a Sample with the Micro Double Valve Pump

1. Prior to installing 408M take a Water Level measurement using an accurate Water Level Meter such as the Solinst Model 101 to determine the height of water above the pump intake. A minimum of 10 ft. is recommended.
2. Insert your sample line at surface into your sample container.

**Note:** Please refer to the 466 Electronic Control Unit Operation Instructions for proper setup and operation using a compressed gas source.

3. Adjust the control unit "Pressure Regulator" to the appropriate value  $[(\text{pump intake depth below grade in feet} \times 0.43) + 10 \text{ psi}]$ .
4. Adjust the Drive and Vent times on the Model 466 Electronic Control Unit to adjust the sampling flow rate to the desired amount.
5. During the Drive period on the Control Unit, the sample line will produce your water sample. During the Vent period on the Control Unit, the Drive Line is filling again under hydrostatic pressure.
6. **For Double Valve Pump Optimization**, select the desired flow rate from the pre-set screens. Use the Flow Regulator to adjust flow to your desired rate. If a higher flow is required, slowly increase the Drive time to increase the flow rate. If air is expelled, decrease the Drive time. To further optimize the flow rate, increase or decrease the Vent time until the highest flow rate is achieved.
7. Once optimum flow rates have been achieved, make note of the pressure, flow rate and timer settings for subsequent sampling dates. For example, with an 85 ft. - 408M assembly and a static water level at 60 ft. With a pump pressure of  $[(85 \text{ ft.} \times 0.43) + 10\text{psi}] = 50\text{psi.}$ , a suitable drive of 11 sec. and vent of 9 sec., will produce a flow rate of about 150mL/min.



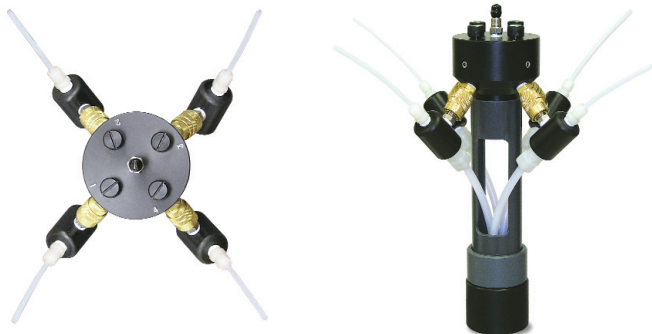
### Decontamination Suggestions

1. Disassembling your Model 408M Micro Double Valve Pump is not recommended.
2. Following your usual cleaning protocols, we suggest washing the exterior of the pump assembly with a suitable cleaning solution (ie. soap, mild solvent).
3. The pump's interior can be cleaned by flushing or pushing your cleaning solution up and through the pump's intake. You have a couple of options to achieve interior flushing.
4. With the filter unscrewed and off the pump's intake, push a clean piece of 5/8" X 3/8" silicon (or equivalent) tubing over the 3/8" OD SS pump intake. Alternatively, you can use a 1/4" push fitting (1/4" X 10-32 UNF) which can be directly threaded into the pump's intake. Then push a suitable length of 1/4" tubing into this fitting. With either option, connect the other end of the tubing to a peristaltic pump and push your cleaning solution through the pump's interior.

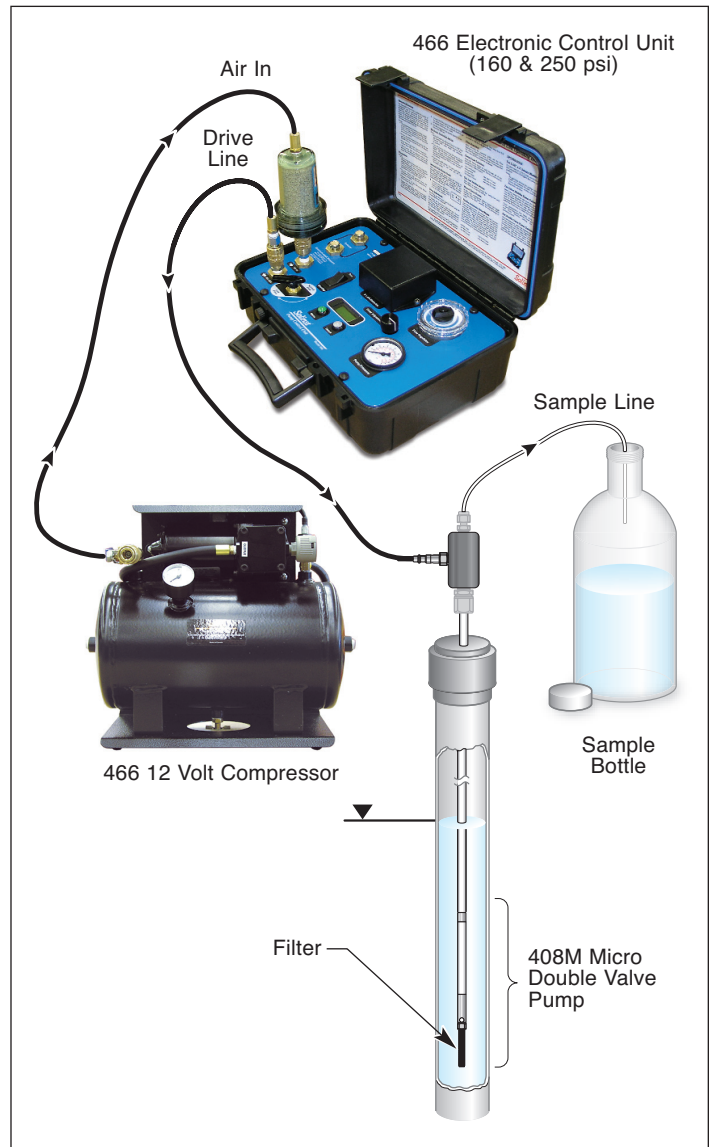
### Optional Multi-Purge Manifold Assembly

To purge and sample up to 7 Micro Double Valve Pumps, at a single location, a Multi-Purge Manifold Assembly is available.

1. Mount the Multi-Purge Manifold over the well installation, after obtaining water level measurements.
2. Thread the pumps down through the collar opening in the Multi-Purge Manifold below the head assembly.
3. Connect each individual pump manifold to the appropriately numbered Multi-Purge Manifold connection by pushing the male LL10 connector (on the pump manifold) into the brass quick connect fitting (on the assembly) while pulling back the brass sleeve on the fitting.
4. Connect the compressed gas source/controller to the Multi-Purge connection at the top of the head assembly, using the same method as describe in step 3.
5. Open and adjust valves on the head assembly of the Multi-Purge Manifold for those pumps that require purging/sampling. Operate control box according to the instructions provided.



Top and Side View of Multi-Purge Manifold with 4 Pumps Connected.



Typical Sampling Setup

**Note:** Minimum input pressure to 466 Electronic Control Unit is 100 psi