

## Double Valve Pump

Model 408

The Solinst Double Valve Pump (DVP) is a pneumatic drive pump that allows consistent, high quality samples. It has been field proven in thousands of applications.

It offers excellent performance and reliability. No bladder replacement is required, and the Double Valve Pump provides higher pumping rates than with the Solinst Bladder Pump. There is a selection of sizes and materials, variable flow rates, and it is field serviceable.

The DVP is suitable for low flow or regular flow sampling. The stainless steel pumps can operate to depths of 500 ft (150 m) and the PVC Double Valve Pump can operate to depths of 100 ft (30 m).

## Features

### Low Cost PVC

This makes dedication more feasible for projects where budgets are tight. The lower capital cost allows several PVC pumps to be dedicated for the cost of one portable stainless steel pump. Dedicated pumps also save on field decontamination times and costs. A weight may be used to overcome buoyancy. PVC pumps are also useful for applications where stainless steel is unsuitable, such as:

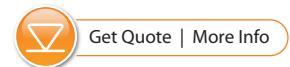
- metals analysis
- sampling highly corrosive liquids

### Easy Decontamination

Everything is easily accessible; replaceable and with interchangeable parts. All components can be cleaned with mild detergent or non-phosphate soap.

### Survives Dry Pumping, Dirty Air and Sand

Pumps are not damaged by operation in sediment laden water, or in dry pumping conditions.



## Applications

### Low Flow Sampling

Gives excellent VOC retention, comparable with bladder pump results. When using the Solinst Model 464 Electronic Pump Controller, the DVP can be adjusted to provide a continuous output of 100 ml/min or less.

### Non-Vertical Applications

Operates effectively at almost any angle and can be placed under landfills, tailings, storage tanks or plumes.

### Leachate/Product Pumping

Pneumatic drive pumps are well suited for pumping contaminant liquids. High solids content, solvents, hydrocarbons, and other chemicals are easily and economically pumped.



## Dedicated and Portable Systems

For long term monitoring it is best to dedicate the pumps to reduce sampling time and avoid cross-contamination. Dedicated well caps are designed for ease of use. Caps easily slip onto 2" or 4" wells, and have quick-connect fittings for the drive and sample tubing.

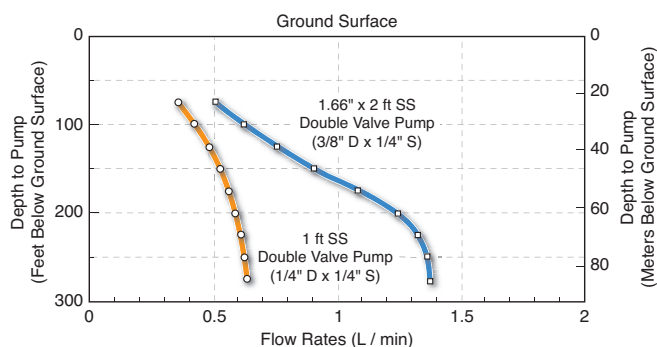
For less frequent sampling, reel mounted portable systems allow access to multiple monitoring wells, even in remote locations. The reel mounted portable units are free-standing with a convenient carrying handle. They can be made for almost any size or depth of application.



Portable Pump on Hand Reel

## Pump Operation

When the pump is placed in a well or borehole, water rises inside the pump and the tubing to static level. Gas supplied from the Controller pushes down on the water column contained in the drive line tubing, closing the check valve at the base of the pump. This forces water up the sample line tubing.



Flow Rate vs. Depth to Pump  
(Depth to water at 50 ft (15 m))

A vent period, during which the gas is released, allows hydrostatic pressure to refill the pump and drive line with sample water. The top check valve prevents water in the sample line from falling back into the pump body. This pressurization and vent cycle is repeated to bring water to the surface.

For proper collection of volatiles, the pressure applied must never be high enough, nor the drive period long enough, to enable gas to enter the body of the pump and aerate the sample. If operated properly, "air" will never come in contact with the sample water, which produces high quality VOC samples comparable to those of a bladder pump.

Flow rates vary with depth of pump below surface, depth below water level, size of drive and sample tubing, drive and vent cycle times, gas pressure applied, aquifer recharge, and size of pump body.

## Electronic Pump Controllers

Solinst offers the Model 464 Control Unit in both 125 psi and 250 psi versions. Both units use 4 AA batteries and are fully automatic with preset sample modes from high to low flow. This allows faster purge rates and precise low flow control to ensure a representative sample at 100 ml/min or less when sampling for VOCs.

The 464 can also be operated manually if your batteries run out in the field, using only a compressed gas source. In addition, up to 99 user-created flow rates can be saved in its memory.

The Control Units are supplied in a convenient rugged box, suitable for all environments. Quick-connect fittings allow easy, instant attachment to dedicated well caps or portable reel units, and to an air compressor or compressed gas source.

## Size and Material Options

Solinst offers Double Valve Pumps in either 316 stainless steel with Viton® o-rings, or in PVC with a polyethylene filter. The two standard pump body sizes are:

- 5/8" dia. x 1 ft long (16 mm x 300 mm)
- 1.66" dia. x 2 ft long (42 mm x 610 mm)

Standard dedicated systems use 1/4" (6 mm) sample and 3/8" (10 mm) drive LDPE tubing. Portable systems use dual 1/4" (6 mm) skip-bonded LDPE lined with Teflon®. Adaptors for both 1/4" and 3/8" (6 mm and 10 mm) tubing are included.

The Micro Double Valve Pump is a flexible, 3/8" (10 mm) diameter, Teflon Pump. It is ideal for low flow sampling in narrow applications. (See Solinst Model 408M Data Sheet).

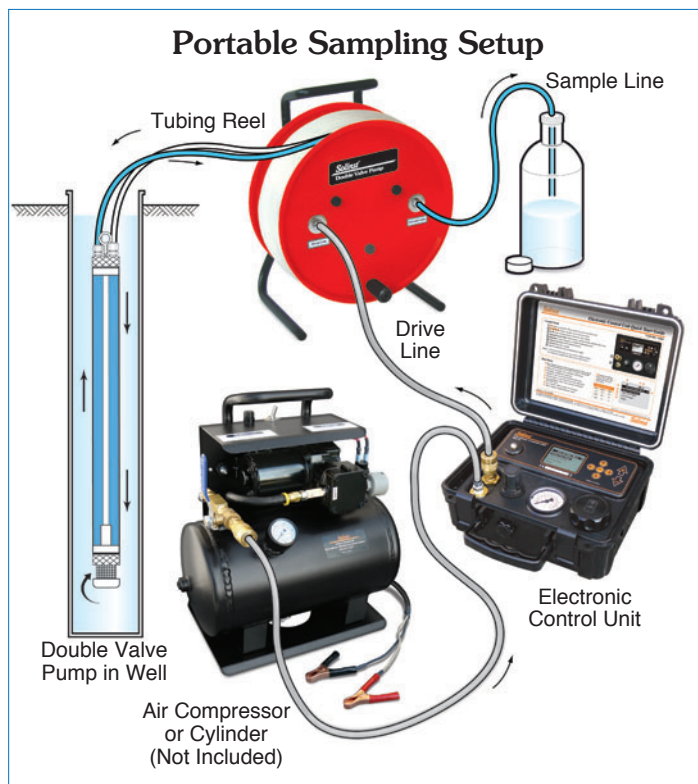
## Accessories

**12 Volt Air Compressor:** Portable, designed to operate using a vehicle's battery. Ideal for field use, especially low flow applications of less than 100 ft (30 m) depth.

**Packers:** Save time and reduce costs by minimizing the volume of water purged. (See Solinst Model 800 Data Sheet).

**In-line Disposable Filters:** 0.45µm, with 700 cm<sup>2</sup> filter area. (See Solinst Model 860 Data Sheet).

**Tag Line:** Convenient reel-mounted marked cable, for depth discrete pump support. (See Solinst Model 103 Data Sheet).



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