Inertial Pump

Model 404

The Inertial Pump is a simple, reliable inertial pump that provides a cost effective sampling option for groundwater monitoring.

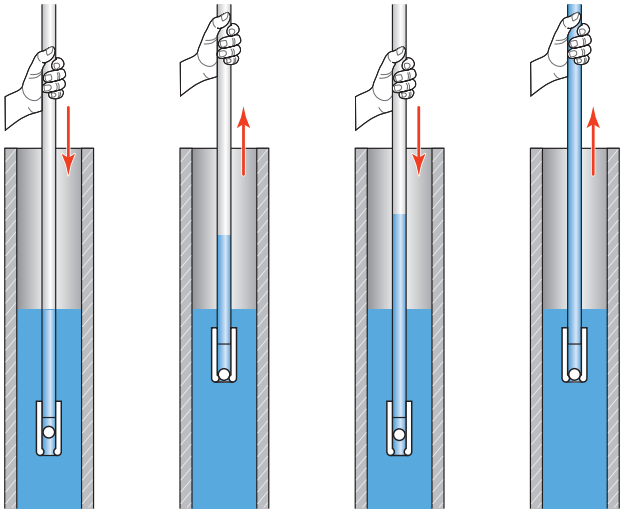
The Pump consists of a riser tube fitted with a one-way footvalve. It can be easily operated manually at shallow depths, or by using a surface pumping mechanism. The tubing and footvalves come in a range of sizes suitable for most well diameters and sampling applications. A 1/4" (6 mm) Mini Inertial Pump is available for sampling inside CMT Multilevel Systems (See Solinst Model 403 Data Sheet.)

The Inertial Pump is a simple alternative to using a bailer. Like a bailer, the key part is the check ball which is located in the foot of the pump. As such, the Inertial Pump is often referred to as a 'footvalve'.

Operation

To obtain a sample, hand-thread a footvalve onto the tubing, and then lower to the desired depth in a well or borehole. Repeatedly lower and raise the assembled tubing and footvalve approximately 6" - 12" (15 - 30 cm). A slug of water enters the tubing on the downward stroke and is retained, as the valve closes, on the upward stroke. This enables the water to gradually rise in the tubing and discharge at surface.

It is very easy to operate the pump by hand, but if preferred, surface pumping mechanisms powered manually, or by gasoline or electricity are available.



Inertial Pump Operation

From left to right: Mini Inertial Pump, SS16, SS19, D16, and D25 Inertial Pumps

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Features

- Easily operated by hand
- Ideal for well development
- Operates to 200+ ft. (60+ m)
- For 0.4" - 6" ID wells (12 mm - 150 mm)
- Efficient purging rates, and high quality samples
- Essentially maintenance free

VOC Samples

To obtain high quality VOC samples, use approximately 8 ft. of 1/4" diameter (2.5 m of 6 mm) sample tubing inserted into the riser tube, leaving about 1 ft. (30 cm) protruding. Develop a steady flow of water, and upon ceasing, the sample tube will continue to act as a gravity flow siphon and produce undisturbed VOC samples. To collect VOC samples, free of any contact with the air, Solinst recommends the Model 407 Bladder Pump. (See Solinst Model 407 Data Sheet.)

Ideal for Dedication

- Low cost
- Avoids cross-well contamination
- Eliminates repeated pump decontamination
- Avoids costly field and wash blanks
- Reduces time in the field
- Fast, easy operation

Riser Tubing

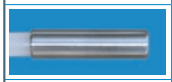
High density polyethylene (HDPE) tubing is most frequently used. It is low cost, provides high strength and durability, and good sampling properties. Available in various sizes, the tubing comes in coils of 100, 200, or 500 ft. (30, 60, or 150 m). PTFE tubing is also available.

Footvalves

Footvalves consist of a check ball inside the valve body, and are available in Delrin or stainless steel, in a variety of sizes from 5/8" to 1" (16 mm to 25 mm) diameters. Tapered threads enable the footvalve to self-tap onto either end of the riser tubing.

The Mini Inertial Pump (403 MIP) consists of two stainless steel inserts and a check ball that are easily installed inside the 1/4" x 0.17" (6mm x 4.3 mm) tubing.

Pump Specifications

Pump Assembly	Footvalve	Footvalve Dia.	Tubing Selection
	403 MIP	1/4" (6 mm)	1/4" x 0.17" (6 mm x 4.3 mm)
	D16	5/8" (16 mm)	5/8" x 1/2" (16 mm x 12.5 mm)
	SS16	5/8" (16 mm)	5/8" x 1/2" (16 mm x 12.5 mm)
	SS19	3/4" (19 mm)	5/8" x 1/2" (16 mm x 12.5 mm)
	D25	1" (25 mm)	5/8" x 1/2" (16 mm x 12.5 mm)

Flow Rates

Flow rate is a function of the momentum generated in the tubing. It varies with tubing length, submergence depth of the footvalve, flexing of the tube, and the rate at which the tubing is pumped.

- Up to 7.6 L/min (2 gpm) with 5/8" x 1/2" (16 mm x 12.5 mm) tubing

Higher volumes are obtained with the use of electric or gasoline powered surface pumping mechanisms.

In-line Disposable Filters

High flow, in-line disposable filters have a 0.45 µm membrane. They have a 650 cm^2 filtration area, to effectively prepare samples for dissolved metals analysis, or to filter large volumes of turbid groundwater. Each filter has 3/8" (9.5 mm) hose barb inlet and outlet connections, as well as a 1/8" NPTM vent/drain connection.

These filters can also be used with most other Solinst sampling devices. (See Solinst Model 860 Data Sheet.)

Model 860 Disposable Filter

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