Solinst® Multilevel Drive-Point Piezometer

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Model 615ML Data Sheet

Stainless Steel Multilevel Drive-Point Piezometers

Model 615ML

Monitor up to six isolated zones in a single drive location. **The 615ML Multilevel Drive-Point Piezometer** provides an affordable method to obtain shallow groundwater and soil vapor samples. Solinst also offers the Model 403 CMT® Multilevel System and Model 401 Waterloo Multilevel System (see Model 403 and 401 Data Sheets).

Multilevel Drive-Point Piezometers consist of monitoring ports with stainless steel, 100 mesh cylindrical filter-screens on 3/4" OD stainless steel drive-point port bodies. The ports are connected using 3/4" NPT stainless couplings and drive pipe extensions. A drive-point tip threads onto the first extension, or port, to be driven into the ground. Monitoring ports, couplings, and extensions are added as the piezometer is advanced into the subsurface.

The Drive-Points are designed for single use installations, and not for removal and reuse. They can also be used for temporary, short term monitoring applications. Solinst Multilevel Drive-Point Piezometers can be driven into the ground with any direct push or drilling technology, including a Manual Slide Hammer.

Advantages of Multilevel Drive-Points

- Up to 6 depth-discrete zones in a single drive
- Low cost and made from durable materials; some accessories available locally
- Easy to assemble and installs quickly using direct push methods or a manual slide hammer

Multilevel Drive-Point Applications

- High-resolution vertical subsurface profiling
- Groundwater sampling, including VOCs
- Water level monitoring
- Soil gas sampling
- Multilevel groundwater monitoring
- Contaminant plume delineations
- Low cost and minimal disturbance site assessment

Manual Slide Hammer

To install Multilevel Drive-Point Piezometers inexpensively, the Manual Slide Hammer can be used. The 21 lb (9.5 kg) slide hammer and all other equipment can easily be transported to most sites.

A heavy duty drive head is used, on which the slide hammer impacts, and a tubing by-pass ensures that the tubing does not get damaged during installation.

Accessories

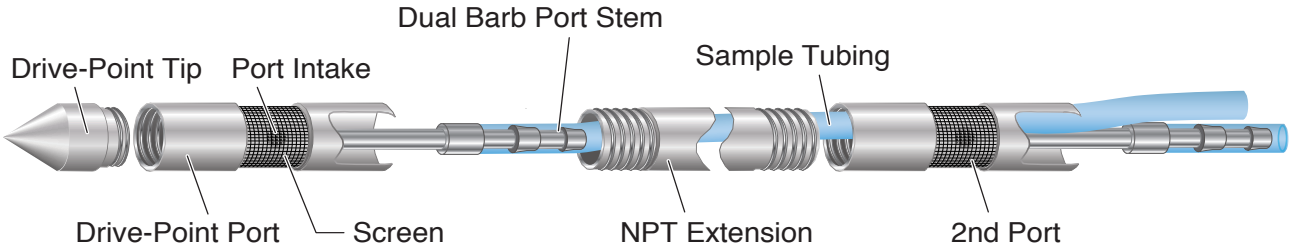
Solinst supplies 3/4" NPT Delrin® caps, and stainless steel couplings and extensions. These accessories can also be locally sourced at plumbing and hardware stores.

Depth Limitations

Multilevel Drive-Point Piezometers are suitable for many sites. The depth limitations vary with soil conditions and the drive method used.

High Quality Groundwater and Soil Gas Samples

The 615ML Multilevel Drive-Point Ports have a dual barb stem to allow the connection of 3/8" OD (9.5 mm) or 1/4" OD (6 mm) polyethylene or PTFE-lined tubing to create up to 3 or 6 monitoring zones, respectively. Sample water enters the port, passes into the stem, and up into the monitoring tube.



Groundwater Sampling Within Narrow Diameters

Peristaltic Pump, Model 410

The Peristaltic Pump uses the suction lift principle. Suitable for 1/4" (6 mm) ID or larger diameters. The Peristaltic Pump provides a regulated and steady flow. It will lift water up to 32 ft. (10 m) at sea level.

Narrow Cable Water Level Meters

Water levels can be measured in a 615ML Multilevel Drive-Point Piezometer using a **Model 102 or 102M Mini Laser Marked Cable Water Level Meter** with a P4 (4 mm) probe.

The Importance of Multilevel Monitoring

Multilevel groundwater monitoring involves creating a series of discrete isolated intervals at various depths in a single borehole. This high-resolution subsurface profiling method has many advantages:

- Provides detailed subsurface data for accurate 3D site assessments, including horizontal and vertical contaminant concentrations and flow
- Short multilevel screens overcome issues created by long screens, which blend groundwater chemistry over the entire length
- Ambient flow between different zones in a well is avoided with properly isolated multilevels, preventing cross-contamination or flow outside the well
- Low cost compared to installing multiple boreholes and reduced site disturbance; less permits and time required on site
- Reduced field time due to smaller purge volumes, reduced disposal, efficient sampling and rapid response to pressure changes in small diameter monitoring tubes
- Improves remediation strategies by monitoring the thickness, concentration variations, movement and extent of a plume over time

Solinst Multilevel Groundwater Monitoring Systems

Since the early 1980s, Solinst has been working with experts in the hydrogeology field to develop groundwater monitoring systems, which provide the high-resolution subsurface data that accurate subsurface investigations demand. Solinst manufactures three different types of multilevel systems, each suited to different environments and applications.

Up to 6 monitoring zones

Install to 20 ft (6 m)

Example: in overburden

615ML Multilevel Drive-Point Piezometer

Up to 7 monitoring zones

Install to 150 ft (50 m)

Example: with sand and bentonite backfill layers

403 CMT® System

Up to 24 monitoring zones

Install to 1000 ft (300 m)

Example: permanent packers in cored hole

401 Waterloo System

Illustrations not to scale

Multilevel System Comparison

Multilevel Drive-Point Piezometer

Solinst has been manufacturing high quality stainless steel Drive-Point Piezometers with single monitoring points for years, and in 2021 developed the Model 615ML Multilevel Drive-Point Piezometer. Stainless steel monitoring ports are connected using 3/4" NPT steel drive pipe and couplings. Dual barb stems allow the connection of 3/8" OD (9.5 mm) or 1/4" OD (6 mm) tubing to create up to 3 or 6 monitoring zones, respectively. Drive-Point Multilevel Systems require very few tools to construct and can be installed simply using direct push methods, including a manual slide hammer. These systems are easy to transport with portable sampling and level monitoring options.

The CMT® System

Since 1999, Solinst has manufactured the Model 403 CMT Multilevel System. CMT consists of continuously extruded polyethylene tubing with seven or three separate channels running its length. Monitoring zones are mechanically created and sealed off, one in each separate channel at different vertical intervals. CMT offers in-field design flexibility, is low cost and easy to install. The number of monitoring ports, port locations, install depths, and monitoring strategy, can all be accommodated and finalized on site. The 7-Channel System is 1.7" (43 mm) and the 3-Channel is 1.1" (28 mm). They are ideal for shallow applications in narrow diameter boreholes.

The Waterloo System

Solinst has manufactured the Model 401 Waterloo Multilevel System since 1984. The System uses modular components of various casing lengths, sampling ports, and optional packers that are connected to form a sealed casing string. This design gives excellent flexibility, allowing placement of ports and packers to suit borehole logs. Pumps and/or transducers can be dedicated to each port. All instrument tubing and cabling is contained within these modules and collected at the top of the system at a wellhead manifold. The Waterloo System is ideal for long-term monitoring in bedrock and cased boreholes, and has been used to depths of 1000 ft. (300 m).

	Multilevel Drive-Point Piezometer	CMT System	Waterloo System
Ideal Depth	3 ft – 20 ft (1 m – 6 m)	20 ft – 150 ft (6 m – 50 m)	100 ft – 1000 ft (30 m – 300 m)
System Diameter	3/4" (19 mm) ID	7-Channel: 1.7" (43 mm) OD 3-Channel: 1.1" (28 mm) OD	2" (50 mm) OD
Typical Installations			
Overburden	3/4" (19 mm) ID installation with direct push or manual slide hammer	> 3.25" (8.3 cm) dia. (direct push, hollow stem auger, sonic drilling)	>5" (12.5 cm) dia.
Bedrock	n/a	>3.25" (8.3 cm) dia.	3" (7.6 cm) to 4" (10 cm) dia.
Isolating Zones			
Engineered Packers	n/a	3-Channel	√
Layers of Sand and Bentonite	n/a	√	√
Direct Burial	n/a	√	√
Max # of Sampling Zones	6	7	24
Soil Gas Monitoring	√	√	√
Measuring Depth to Water			
<20 ft (6 m) below ground	102 Water Level Meter	102 Water Level Meter	102 Water Level Meter
>20 ft (6 m) below ground	n/a	102 Water Level Meter	102 Water Level Meter or Pressure Transducer
Groundwater Sampling			
Dedicated	n/a	- 1/4" Mini Inertial Pump - 3/8"DVP	- Bladder Pump - 5/8" DVP
Portable	- 410 Peristaltic Pump	- 410 Peristaltic Pump - 403 404 1/4" Mini Inertial Pump - 408M 3/8" Micro DVP	- 410 Peristaltic Pump - 403 404 1/4" Mini Inertial Pump - 408M 3/8" Micro DVP
Applications	- Base flow monitoring in stream beds - Soil gas sampling - Sparge points - Low cost, minimal disturbance site assessments - Surface water/ groundwater interaction investigations	- UST monitoring - Vapor monitoring - Submarine discharge monitoring - monitoring in high water table environments - Dewatering impact assessments - Mass transport and mass flux calculations VOC, MTBE and Perchlorate monitoring at NAPL sites	- Monitoring salt water intrusion - Install at industrial cleanups - Investigate pipeline leaks - Dam leakage/rehabilitation - Contaminant identification/cleanup at DNAPL & LNAPL spill sites - monitoring waste disposals/landfills - Performance monitoring of pump and treat systems

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November 10, 2022