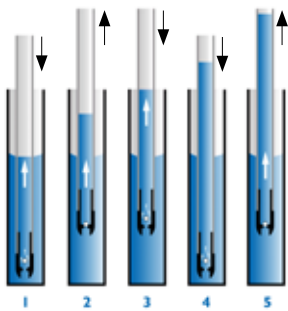


# Waterra Inertial Pumps

## Tubing, foot valves and accessories

A simple and inexpensive range of pumps for groundwater sampling

### Waterra Inertial Pumps How do they work?



Tubing fitted with a foot valve is lowered below water level to the sampling depth in the borehole and fills with water (1).

To pump, the tubing is oscillated up and down. On the up-stroke (2) the valve closes and the water column is lifted within the tubing.

On the down-stroke (3, 4), the upward inertia in the water column keeps and adds to the water within the tubing whilst the valve is open (3, 4).

The cycle is then restarted (5) and continued.

VS5

D32

VS4

D25

VS3

VS2

VS1

### Applications

- Purging and sampling groundwater from boreholes up to 200mm in diameter.
- Sampling from narrow piezometer tubes.

### Benefits

- Simple to use and maintain.
- Inexpensive.
- Pump depths of up to 85m in 50mm diameter boreholes.
- Can be used as a dedicated pumping system.
- Ideal for contaminated environments.

### Design features

- HDPE tubing in 6 system sizes.
- Self-tapping stainless steel foot valves.
- Stainless steel & Delrin foot valves.
- Manual or powered operation.

25mm High Flow

16mm Standard

16mm Standard X

13mm Low Flow

10mm Micro Flow

6mm Super Micro Flow

# Waterra Inertial Pumps

## Tubing, foot valves and accessories

Waterra Inertial Pumps are probably the easiest to use and most cost effective of all environmental sampling pumps. They can be operated manually at shallow depths, but are their most efficient when used with a powered actuator or suction pump. For further information on powered systems and sampling applications, download the following data sheets from our website:

**PR08 - PowerPack PP1, PR09 - SP1 Suction Pump, PR10 - Applications.**

### Tubing

Waterra's semi-rigid HDPE (high density polyethylene) tubing enables efficient pumping from greater depths than is possible with softer (elastic) alternatives such as LDPE or nylon. Tubing is available in 6 System sizes from 6mm to 25mm in diameter. Standard tubing is the most popular size for use in 50mm diameter boreholes.

Teflon tubing can be supplied in Standard and smaller sizes.



HDPE tubing

### Specification and ordering information

System	Code	Coil length (m)	OD (mm)	ID (mm)	Internal tubing volume (ml/m)
High Flow	<b>HF</b>	30, 60	25	21	350
Standard	<b>STD</b>	30, 60, 100	16	13	130
Standard X	<b>STDX</b>	100	16	10	79
Low Flow	<b>LF</b>	30, 60	13	10	80
Micro Flow	<b>MF</b>	30, 60	10	6	31
Super Micro Flow	<b>SMF</b>	30, 60	6	4	13

### Foot valves

The secret to inertial pumping lies in the design of our range of Delrin and Stainless Steel foot valves. The original Waterra Delrin foot valves have a cutting thread which secures the valve externally over the HDPE tubing. Our low profile bullet-headed 316 stainless steel foot valves have a tapered cutting thread with groove which positively secures the valve into the tubing.



External fitting

Internal fitting

System	Valve code	Body OD (mm)	Thread OD (mm)
<b>Delrin external fitting valves</b>			
HF	<b>D-32</b>	32	25
STD and STDX	<b>D-25</b>	25	16
<b>Stainless Steel internal fitting valves</b>			
HF	<b>VS5</b>	25	21
STD	<b>VS4</b>	16	13
LF and STDX	<b>VS3</b>	13	10
MF	<b>VS2</b>	10	8
SMF	<b>VS1</b>	6	4

### Surface extension tubing

A short length of disposable PVC tubing can be push-fitted over the top of the HDPE inertial pump tubing to provide a flexible point of discharge. Essential for use with HF tubing. Helpful for use with STD and LF tubing when pumping from close to the bottom of a monitoring borehole

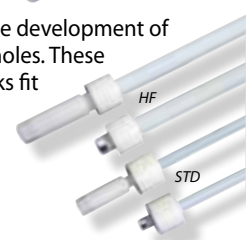


Push-fitting

System	Code	Tubing OD	Tubing ID
HF	<b>HFX-1</b>	30	25
STD	<b>STX-1</b>	22	16
LF	<b>LFX-1</b>	18	13

### Surge blocks

For increased surging action for the development of 50mm diameter monitoring boreholes. These 48mm diameter Delrin surge blocks fit directly above the foot valve onto either HF or STD tubing. They are secured with a stainless steel grub screw and hex key.



System	Code	Description	Body (mm)	
			OD	ID
HF	<b>SB-HF</b>	HF surge block	48	25
STD	<b>SB-STD</b>	STD surge block	48	16
HF & STD	<b>SB-key</b>	Hex key for securing surge blocks		

### Installation tools

#### Tube cutter

Faster and safer than a hacksaw. Provides a clean cut to all tubing sizes without generating any swarf.



#### Valve wrench and VS Keys

Ensures that foot valves are securely attached to tubing. Designed exclusively for use with Waterra foot valves.

System	Code	Description
All	<b>WTC-1</b>	Safety cutter for tubing
HF and STD	<b>WVR-1</b>	Wrench for securing D-25 & D-32 valves
SMF and MF	<b>VS12-Key</b>	Hex key for securing VS1 & VS2 valves
LF	<b>VS3-Key</b>	Hex key for securing VS3 valves
STD	<b>VS4-Key</b>	Hex key for securing VS4 valves
HF	<b>VS5-Key</b>	Hex key for securing VS5 valves