LOW FLOW SAMPLING

Mini Bladder Pumps (MBP)
Specifically Designed for Low Flow Sampling

Application

- **Low-flow ground water purging and sampling**
- **1/2 in and larger-diameter schedule 40 wells**

Description

The MBP pumps consist of:

- PVC or SS outer body
- Teflon bladder
- ½, ¾, 1, 1.3 and 1.66 in dia.

The pneumatic Mini Bladder Pumps are designed to obtain a representative ground water sample with the assistance of a controller to provide variable flow rates. The controller allows the user to match the pumping rate to the well recharge rate, limiting the stress on the formation. With the small volume per cycle, the fluid velocity at the pump inlet is substantially reduced, making the pumps ideal for low flow sampling. The high efficiency design enables pump rates from 5 mL to nearly 2 L/min when used with one of our Precision Dual Range Controllers. The 1.66 in diameter pump will produce flow rates up to 2 gpm.

Tech Tip: *The amount of pump submergence will affect the pump flow rate. Pump curves were developed with 10 ft submergence.*

The bottom inlet of the pump is positioned at the desired sampling point, generally at the mid section of the well screen. The inner Teflon® bladder will fill with fluid based on the submergence of the pump. The annular space is pressurized using the controller and the liquid is gently lifted to surface. All pumps can be supplied contaminant free.

Tech Tip: *In portable applications, the pump is easily decontaminated by submersing it in a cleaning solution such as Alconox®. Then the pump is cycled to circulate the solution through the internal components. This method avoids the need to replace bladders after each use.*

Models for wells down to ½ in and depths to 400 ft. Stainless Steel or PVC.

Dedicated assemblies can be supplied to reduce cross contamination, well disturbance and facilitate installation. The pump, tubing and well cap assemblies are plastic bagged and each assembly is identified with your well ID number and the well depth.

Contaminant-Free Certification

Upon request, ground water sampling pumps may be supplied as certified to be contaminant free. The rinse water from the equipment is analyzed by one or all of the following methods by an independent and accredited laboratory.

EPA Method **624** (Purgeable Aromatics)
EPA Method **625** (Base/Neutral Extractables)

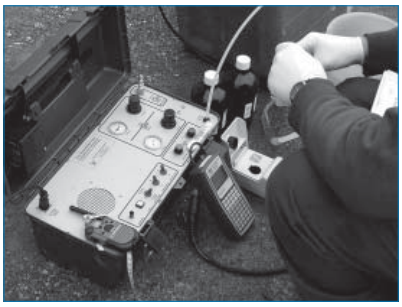
Selection Table

Flow Rates on Page 34

* Depths over 250 ft require the use of a drop tube (TR-041)

Type	Stainless Steel			PVC	
Reference	❶	❷	❸	❹	❺
Diameter	**1/2 in**	**3/4 in**	**1 in**	**1.3 in**	**1.66 in**
Body Length (nom.)	18 in	18 in	18 in	14 in	20 in
Stroke Volume	20 mℓ	51 mℓ	95 mℓ	35 mℓ	175 mℓ
Max.. Lift	100 ft	150 ft	150 ft	150 ft	200 ft*
Tubing Size	1/4 x 1/4 in	1/4 x 1/4 in	1/4 x 1/4 in	1/4 x 1/4 in	1/4 x 3/8 in
Weight	12 oz	12 oz	18 oz	14 oz	2 lb
Materials	Body: 304 Stainless Steel. Bladder: flexible Teflon®			Body: PVC. Bladder: Teflon®	
Part Number	**TR-042**	**TR-037**	**TR-035**	**TR-070**	**TR-074**

Precision Dual Range Controllers


TR-03210 Compressor/Controller

Precision Dual Range Controllers allow precise control of the cycle time and the air pressure supplied to the bladder pump. This degree of control makes it easy to obtain a repeatable sample. Two independent air pressure regulators with gauges are provided to allow precise control of the applied pressure in ranges of 2-50 psig and 5-100 psig. The encapsulated timer module provides accurate, independent timing of the pressure and exhaust cycles from 0.1 to 10 seconds.

The standard controller has no compressor and requires an external air source. Alternatively and for convenience, we offer a compressor/controller with a built-in, DC powered compressor. This unit is designed for use in wells with depths of 50 ft or less. An external air source can be used for deeper applications.

Both Controllers are powered by an internal lead acid gel cell battery. The standard controller (without compressor) will operate continuously for approximately 2-3 days. The controller with built-in compressor will operate continuously for approximately 1½ hours on a fully charged battery. The use of an external 12 V marine battery is recommended for longer operating periods. Includes 110 V (ac) charger and 12 V auto adapter.

ORDERING INFORMATION	
TR-032	Precision Dual Range Controller
TR-03210	Precision Dual Range Controller w/ Built-in Compressor

Tubing, Cable

For a comprehensive selection table, see page 19.

ORDERING INFORMATION	
TR-033	1/4 in Teflon-Lined Poly x 1/4 in Poly Bonded Tubing
TR-034	1/4 in Poly x 3/8 in Teflon®-Lined Bonded Tubing
TR-030	Poly Tubing, 1/4 in Bonded to 1/2 in Teflon® Lined
TR-025	1/4 in Poly x 1/4 in Poly Bonded Tubing
TR-031	1/4 in Teflon-Lined Polyethylene Tubing
TR-023	3/8 in Teflon-Lined Polyethylene Tubing
TR-027	2 in Well Head Ass'y for Bladder Pumps
TR-028	4 in Well Head Ass'y for Bladder Pumps
TR-029	6 in Well Head Ass'y for Bladder Pumps
918702	Nylon®-Coated Stainless Steel Cable
TR-038	Freeze Protection Kit for Mini Bladder Pump
TR-041	Drop Tube Kit

Sample Plus™ DC Pump Systems

Application

- **Low-flow purging and ground water sampling**
- **2 in and larger-diameter schedule 40 wells**

Description

- Variable speed electrical submersible pump
- DC up to 125 ft depths
- AC for 250 ft depths
- Stainless steel and Teflon® construction
- Tefzel® round motor cable

The Sample Plus™ Pumps are used with a power inverter (which must be purchased separately) to provide variable flow rates from 5 mL up to 5 gpm. The inverter is shown above with an additional Six-Stage pump. The pump produces a laminar flow making it ideal for low flow sampling. The six stage pump can be powered by a battery or 115 V AC power. The single stage AC pump uses 115 V and requires a 1200 W (minimum) generator. The Sample Plus Pump is constructed of chemically inert stainless steel and virgin Teflon®. It is specifically designed for use in wells relatively free of silts and sands and should not be used for well development. Pump maintenance is simple. The Sample Plus™ is designed for the replacement of individual components rather then purchasing a complete new pump. The inverter's digital display of the speed makes it easier to produce repeatable flow rates.

Tech Tip: *For decontamination, the pump end can be unthreaded to access the impeller system or Alconox can be circulated through the pump.*

	SIX-STAGE PUMP	SINGLE-STAGE PUMP
Min Well Dia.	2 in	2 in
Max.. Depth	125 ft	250 ft
Flow Rate	75 ml up to 2.2 gpm	100 ml to 5.5 gpm
Power Inverter	12 V DC or 115 V single phase AC power. Feature allows the pump to operate from a battery or a small portable generator capable of producing 290 watts.	115 V or 230 V Sample Plus™ Single Stage Pump Inverter. Requires 1250 W generator .

These pumps may be incorporated on the Real Plus™ System. The power inverters must be ordered separately.