KEEPING
THE ENVIRONMENT
CLEAN

SIRCO

Sampler Handbook

CONTENTS

Introducing the SIRCO 4000 Series Product Line

"The Metro District…has been using SIRCO vacuum type samplers for as many as 37 years… with very few problems. The folks at Southwell have responded to our needs very quickly and professionally. I am very pleased with the SIRCO samplers and would recommend them to anyone."

-- Leroy Gonzales
Transmission Supervisor
Metro Denver Wastewater
Reclamation District

"We've been using SIRCO Samplers in multiple plants for many years. We have no problems with them whatsoever. They're reliable and excellent quality. I'd recommend them to anyone."

-- Jeff Lang
Plant Supervisor
Region of Durham

"The simpler they are, the easier they are to maintain... We've had good longevity with them. Parts are available, and they are easy to maintain."

-- Bob Wilson
E & I Superintendant
Harmac Pulp Operations
Nanaimo, BC

Environments for Automatic Water Samplers

Automatic water sampling equipment is important for many environments:

- Municipal
- Pulp & Paper Industry
- Food Industry
- Utilities
- Chemical
- Industry
- Manufacturing

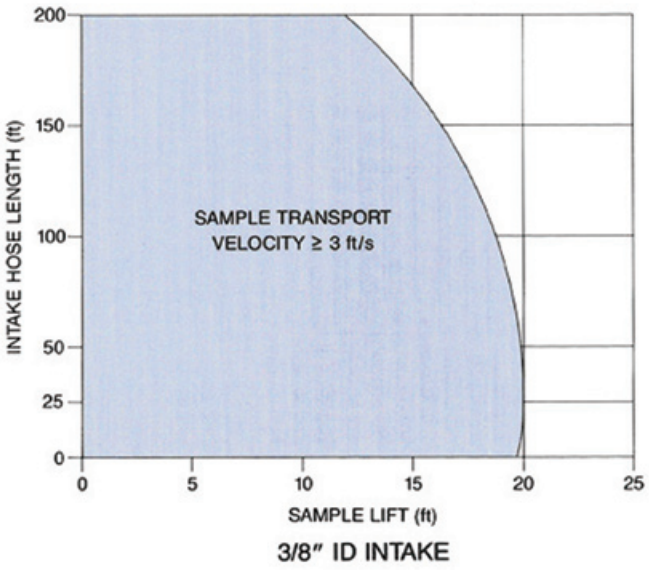
Our customers want a representative sample of the water and other liquids. In many instances, locational challenges make this a difficult task:

- A fast-moving water source (e.g. rivers).
- Large solids in the water source (e.g. wastewater treatement facilities)
- Tall lifts (e.g. above 15 feet)
- Distant locations (e.g. countryside streams, city sewer man-holes)
- Toxic environments (e.g. chemical plants)

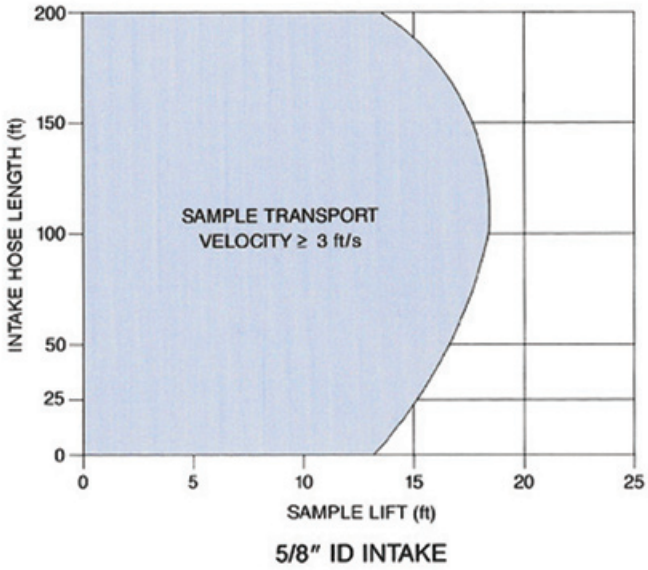
Speeds

The EPA (Environmental Protection Agency) requires that water samples must be taken with speeds in excess of 2 ft/sec (0.6m/sec) and recommends sampling with speeds in excess of 3 ft/sec (0.9m/sec) in order to accurately represent the water. Most automatic samplers display misleading sample velocities (for example 3.3 ft/sec) but qualify that they're measuring only the first three feet of intake tubing. SIRCO patented vacuum technology is capable of sampling at speeds in excess of 5 ft/sec at over 100 feet away!

SIRCO TRANSPORT VELOCITY



3/8" ID INTAKE



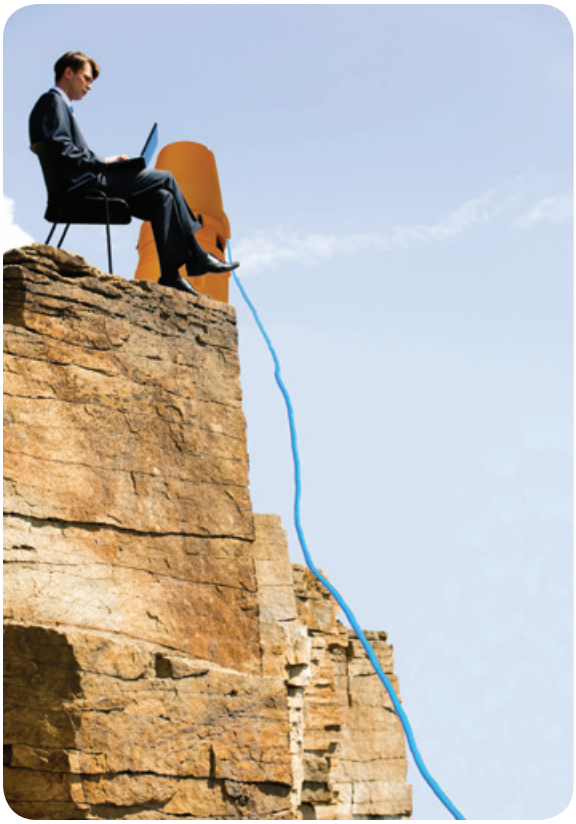
5/8" ID INTAKE

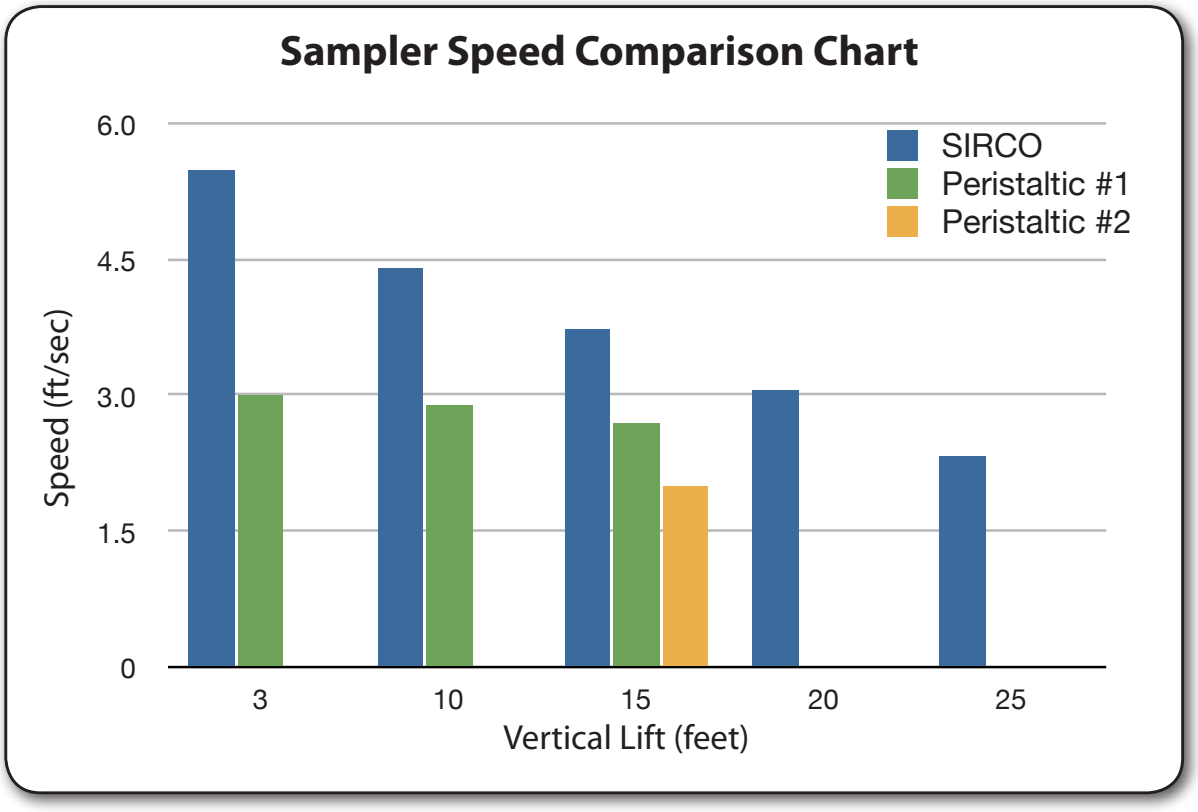
The blue area of these charts represents **samples taken above 3 ft/sec** for height and distance. For example, in lifts of over fifteen feet, both 3/8" and 5/8" tubing can be used to take samples above 3 ft/sec for distances of up to 150 feet.

Vertical Lifts

The greater the lift, the slower the sample speed. Most competitors can only manage 2 ft/sec at 15 feet of vertical lift. SIRCO samplers can draw at 3.7 ft/sec with 15 feet of vertical lift!

Samples can be taken almost anywhere with lift power up to 28 feet and horizontal draw over 120 feet. As seen in the chart below, based on data from two leading peristaltic-pump sampler manufacturers, the SIRCO Sampler pump is able to draw in samples at greater speeds and for higher heights, resulting in greater accuracy.





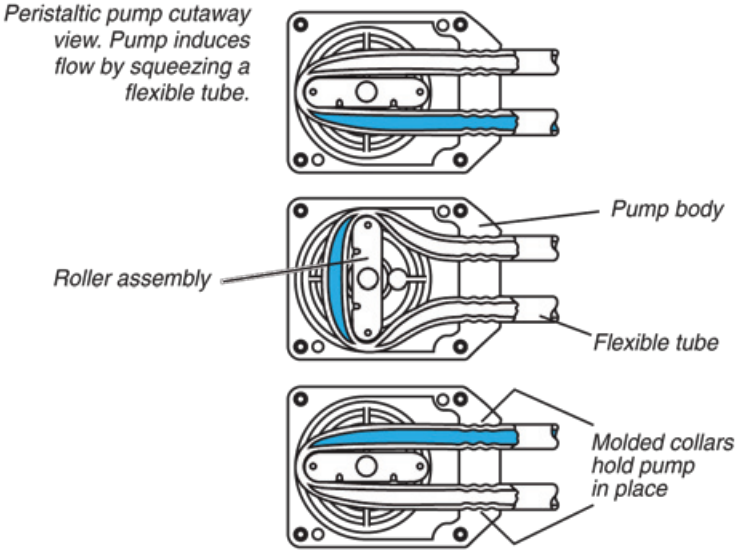
Long-Lasting Parts

Peristaltic-pump sampling equipment requires frequent replacement parts because they draw the sample by repeatedly squeezing the intake tube, causing the tube to wear out quickly. Manufacturers claim tubing lasts 500,000 pump counts, or 500 samples of 200ml each. In other words, for regular use the tubing on a peristaltic model sampler will last two or three weeks.

Frequent tube replacements causes sampling interruptions. This costs valuable time and money, and makes for a less-reliable sampler requiring more overall maintenance.

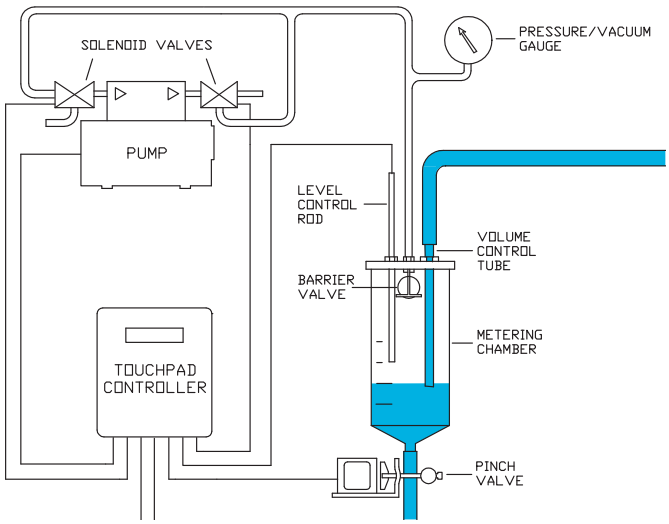
A peristaltic-pump sampler requires frequent replacement of its rotor, stator, driveshaft and gears. The peristaltic method also changes the composition of the sample for effluent with large particles. Samples get **pinched** in the tubing as they are drawn through, as seen in the peristaltic diagram below.

Peristaltic Pump



This is American Sigma's Diagram of a Peristaltic Pump. The tubing goes under a considerable amount of wear-and-tear with every sample. Tubing on peristaltic samplers tends to be replaced every 2-3 of weeks under regular use.

Vacuum Pump

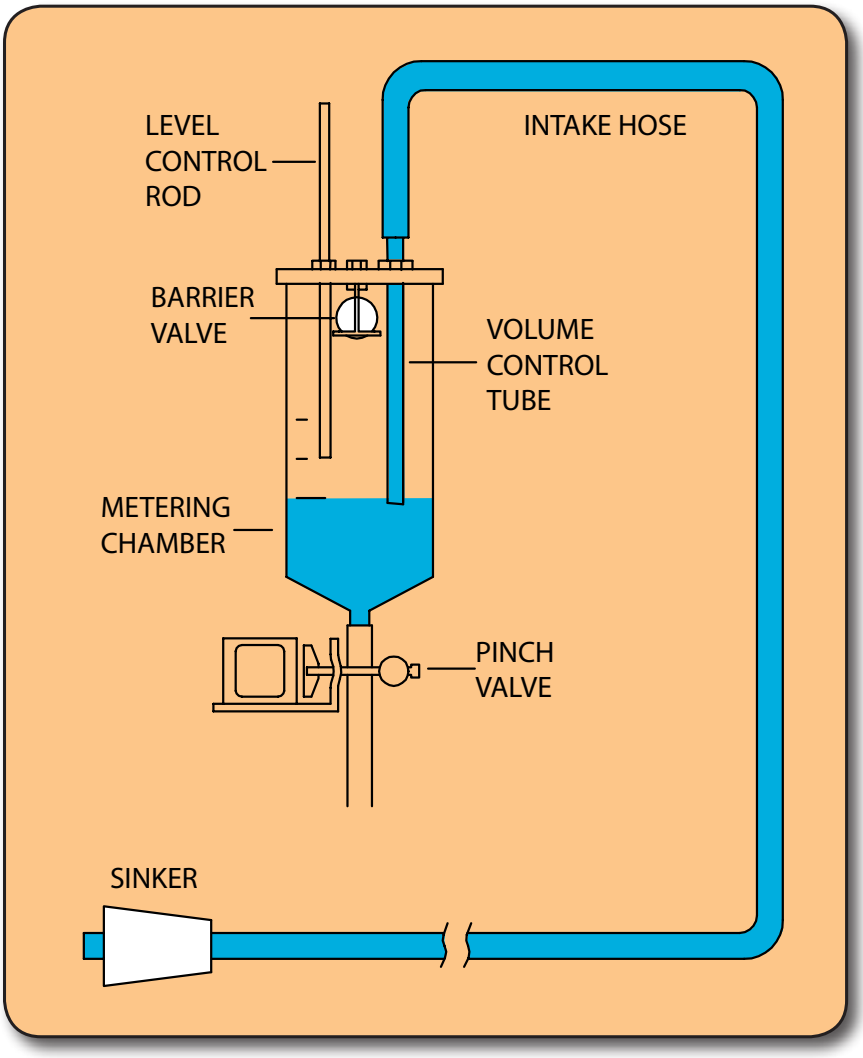


Vacuum sampling uses an external pump to draw its samples. No tubes or other parts are subject to wear using this method. Some SIRCO Samplers have operated for **ten years without replacement parts!**

Accuracy and Cleanliness

SAMPLING PROCESS

1. Liquid is drawn into the metering chamber, up to the level rod.
2. All excess liquid is then purged from the system down to the level set by the volume control tube using the vacuum pump.
3. The sample is then released into either one composite container or one of several discrete containers.



The SIRCO Sampling Process attains highly accurate and representative water samples.

BENEFITS:

1. **Samples are representative.** Rather than squeezing only the desired sample amount through, a larger volume is drawn into the metering chamber, from which the desired sample amount is taken. This allows for solids and suspended material to remain in the final sample.
2. **Sample measurements are precise.** Reliable, consistent sampling within 2cc's of repeatability. Most competitors attain 10cc's in repeatability.
3. **System is purged before and after a sample is taken.** Excess liquid is expelled out of the system with up to 28psi of air pressure. The air purge prevents cross-contaminants from building up in the tubing, unlike the peristaltic method, which uses the same liquid to clean the system, thus resulting in cross-contaminants building-up inside the tubing.

SUPER-CLEAN SYSTEMS

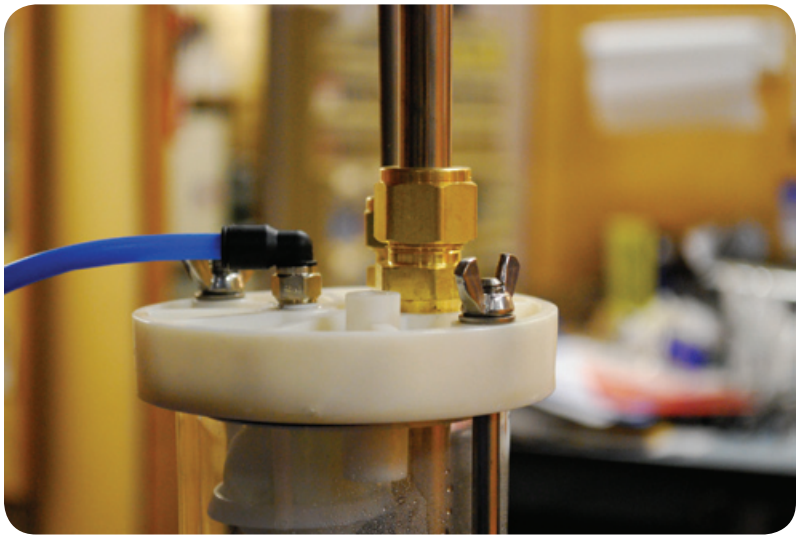
SIRCO Samplers can be "super-clean," specifically for doing chemical tests on the water (biological tests can use the default system). This MISA system includes a glass metering chamber, teflon-lined PVC, silicone O-Ring, Teflon-lined cover, medical-grade latex discharge tubing, and stainless steel on the sinker.

Sampler Contamination in Wastewater Treatment

All WWTP's must take wastewater samples to measure Biological Oxygen Demand (BOD).

BOD is a measure of the rate at which a water sample consumes oxygen when it is injected with an inoculant of aerobic bacteria. The test is performed by inoculating a diluted sample and allowing the bacteria to grow and consume oxygen over 5 days at 20° C.

There are 2 types of bacteria which consume oxygen; nitrogenous bacteria which use ammonia as a food source and carbonaceous bacteria which use organic carbon compounds as a food source. Both are normally present In wastewater. The nitrogenous bacteria are very slow growing but when they become established, they consume oxygen at a much higher rate than do the carbonaceous bacteria.



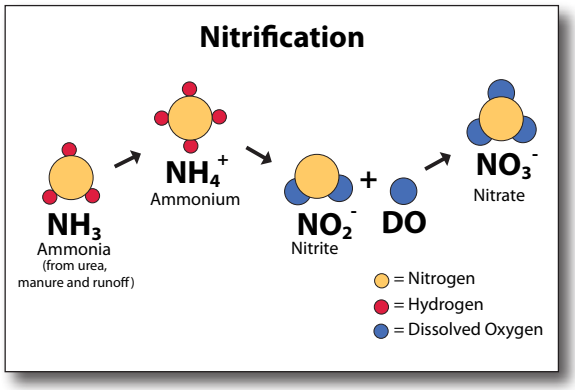
SIRCO Metering Chambers are easy to swap out. Simply remove the two wing-nuts and replace, easily done within 30 seconds.

Nitrifying bacteria are not normally a problem in the BOD test because they are so slow growing that they have no impact before the 5 day test period has elapsed. However, this is not the case if the sample is contaminated with nitrifying bacteria from dirty sampling equipment. In this case the BOD result is inflated because of nitrification from the contaminating bacteria.

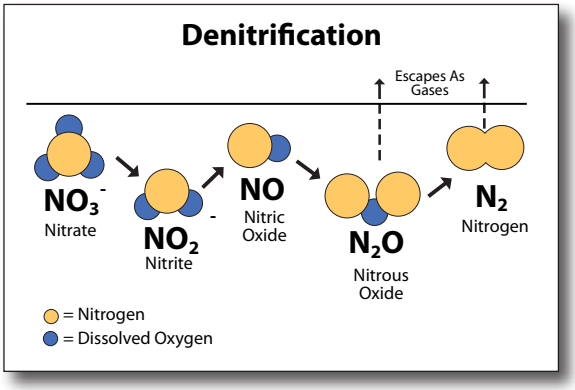
The benefit of SIRCO Samplers vacuum system for drawing in water is that only the metering chamber is subject to contamination, and can be cleaned easily. Peristaltic-pump samplers, on the other hand, pinch the samples as they are drawn through, contaminating the intake tube for subsequent samples. Thus, the BOD test is artificially inflated.

Some regions have chosen to use only vacuum-type samplers, rather than purchasing replacement tubing every week and dealing with artificially inflated results.

Metro Vancouver, in British Columbia, has made every effort to stay away from peristaltic-pump samplers in any of their wastewater treatment facilities for this reason. SIRCO Samplers are used at every plant.



Nitrification is the aerobic biological process, where ammonia (NH_3) oxidizes into NO_3.



Denitrification is the anaerobic biological process, where NO_3 is reduced to NO_2 and then N_2.

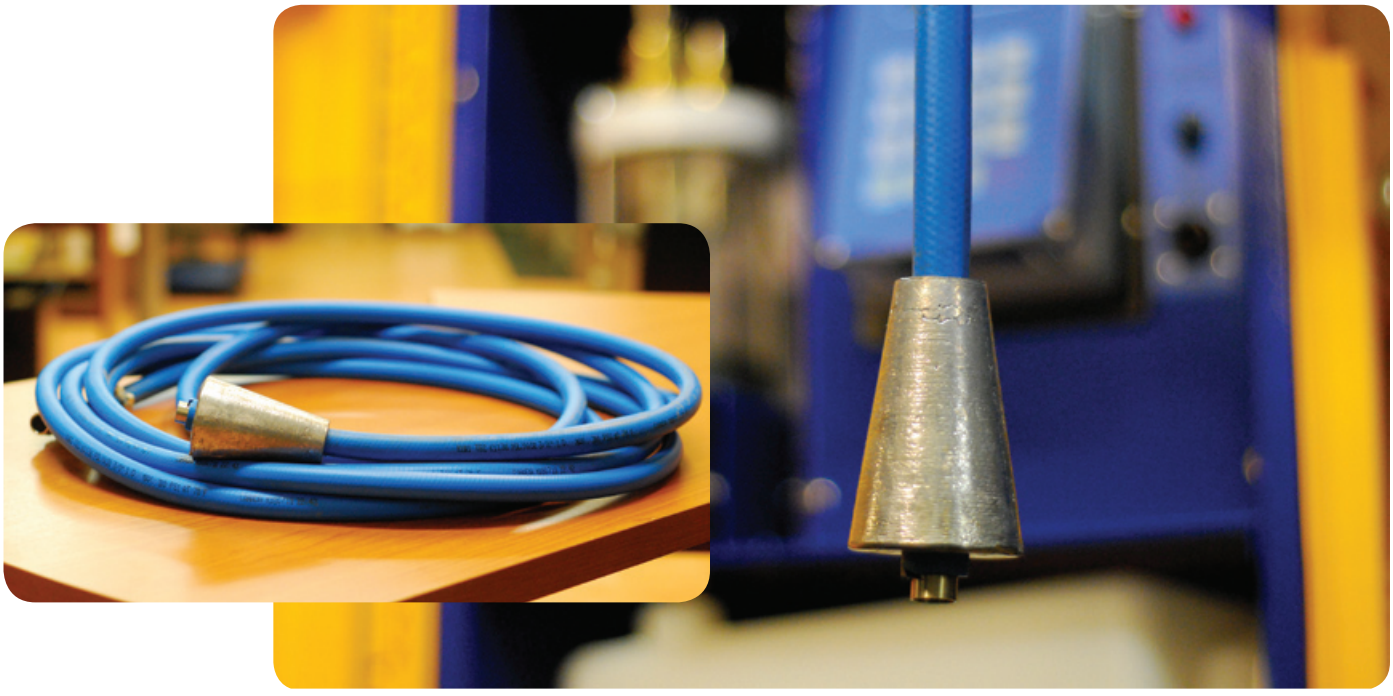
Pre-Sample Purge

AIR PURGE KEEPS SYSTEM CLEAN

All excess water is pushed out of the system using a non-invasive purge of air, both before and after sampling. This leaves tubing clean and free from contaminants. Peristaltic samplers often leave water from the previous sample in the tubing. The next sample is then contaminated by the previous one. To remedy this problem, some advanced peristaltic systems draw from the "dirty" water to rinse out the system. SIRCO Vacuum Samplers make this easy by simply using "clean" air to purge the system.

PLACEMENT OF INTAKE TUBING

Because the force of air from SIRCO vacuum pumps can be strong, some applications stir up the waterbed causing contaminants to enter the sample that are not representative. This is easily remedied if the tubing is positioned properly by placing it so that it is pointed away from the bottom of the sample source (for example, at an upward angle). Sinker and float combinations, available upon request, can aid in the placement of the sinker.



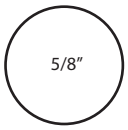
Large Solids

At locations with solids in the wastewater, a large diameter intake tube is required in order to produce more accurate results. Most samplers typically use only 1/4 inch inner-diameter intake tube, and a maximum of 3/8 inch. **SIRCO Samplers can support up to 5/8 inch!** This allows sampling wastewater with larger solids and reduces the risk of blocking the intake line.

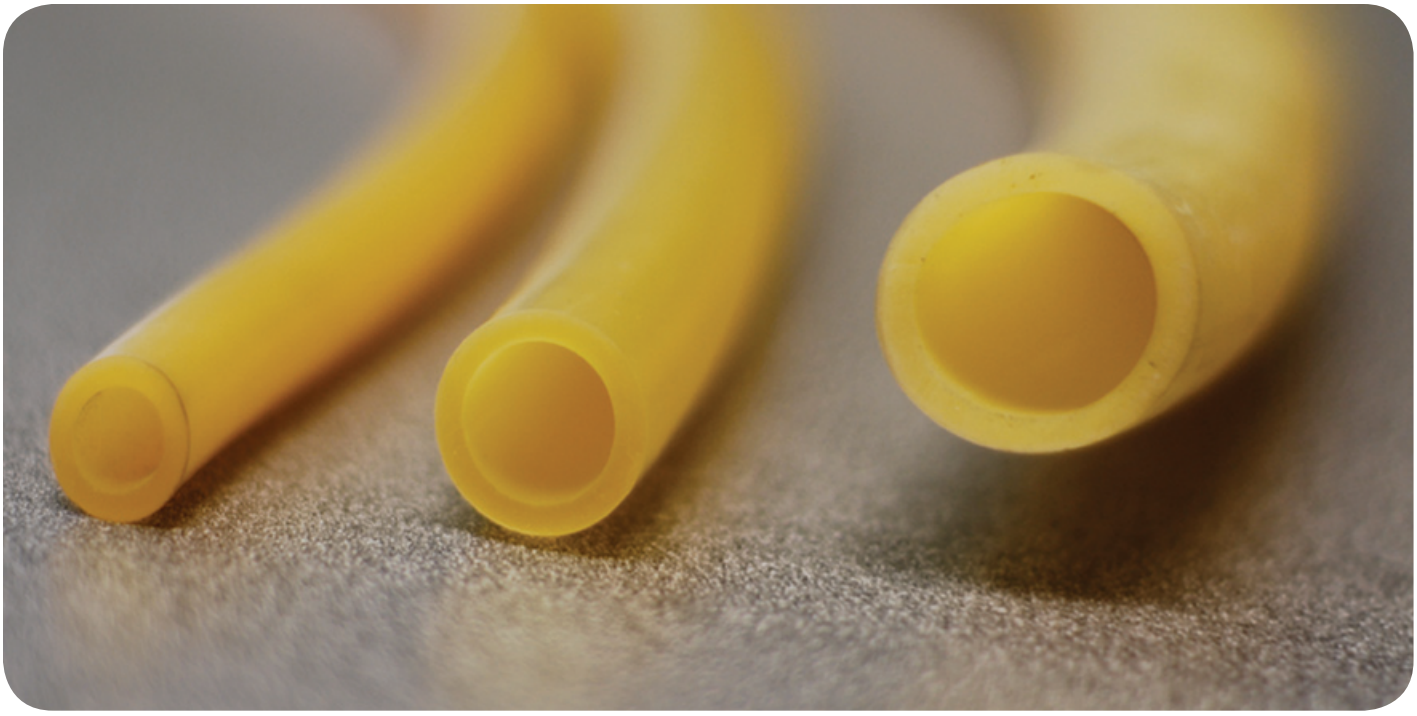
The vacuum-system of sampling has the benefit of not altering the sample. In peristaltic samplers, the tubing squeezes the sample through, which results in a pressed, squeezed, and altered sample if there are solids in it. Also, solids will tend to adhere to the lining of the tube under the squeezing pressure.

1/4" ID tubing: standard on peristaltic samplers

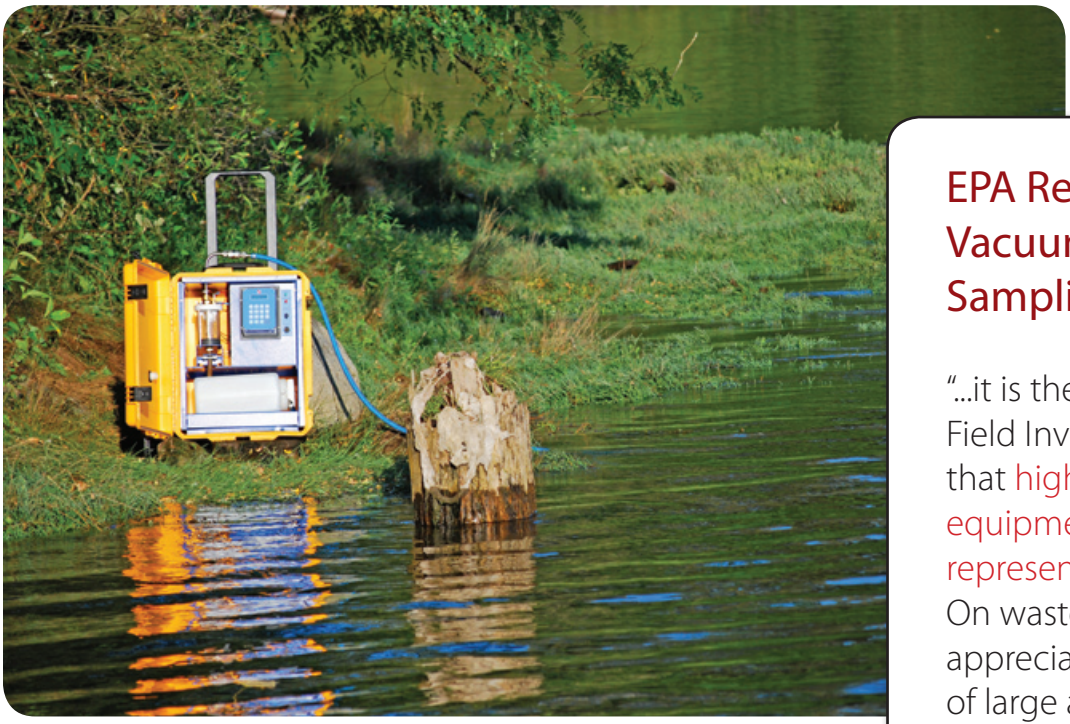
3/8" ID tubing: the maximum for a peristaltic sampler (it will tax the system more quickly). SIRCO's default.



5/8" ID tubing: the larger intake tube is necessary in locations with large particles in the sample source water.



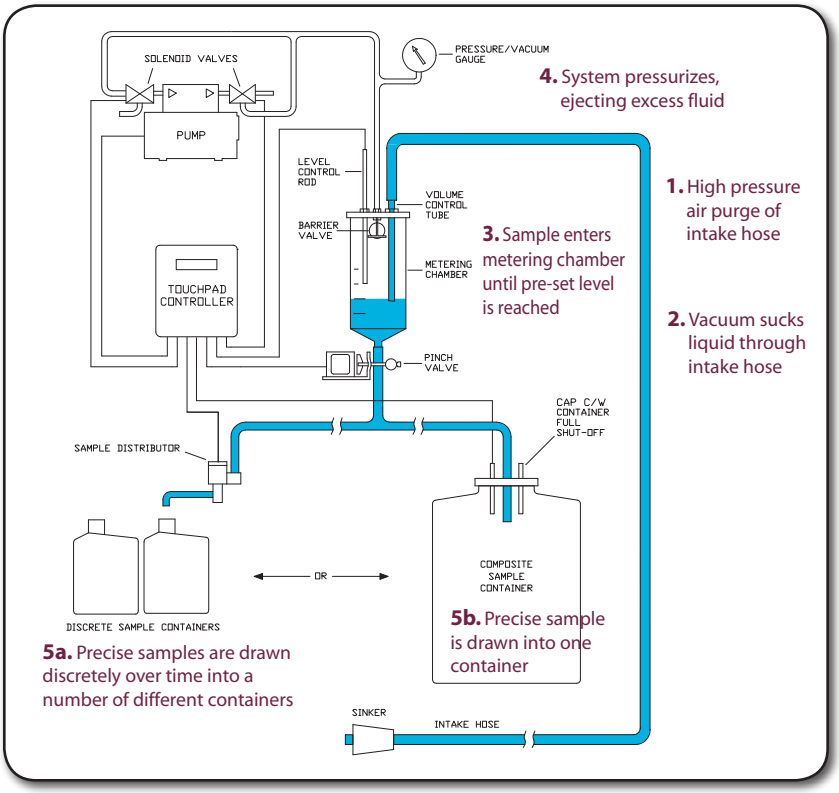
Vacuum Versus Peristaltic



EPA Report comparing Vacuum and Peristaltic Sampling Methods*

"...it is the opinion of the Field Investigations Section that high-vacuum sampling equipment produces more representative samples. On waste sources with appreciable concentrations of large and/or heavy settleable material such as raw municipal wastewater, the section makes every effort to install a high vacuum unit when compatible with the site conditions and data requirements. Since these units yield higher results, they are of advantage to treatment plants in determination of removal efficiencies."

* Excerpt from the Harris-Keffer Report, p.80, available from NTIS, Document PB259875



Composite and Discrete

DISCRETE SAMPLING

is when samples are taken into more than one container. Inside of the refrigerator (or cooling chamber on portable sampler units) is a stepper assembly which revolves 360° and delivers samples into separate containers, ranging from 2 to 24 bottles. Discrete sampling is beneficial in situations where one needs to measure change over time, such as measuring different water characteristics over 24 hours. Labs and municipalities tend to rely on discrete portable sampling.

COMPOSITE SAMPLING

is for drawing water samples into one large container. This is the simplest way of taking samples and typical for most situations where a sampler is set up to measure effluent in one location. It is also signficantly less expensive than discrete sampling.

Structural Highlights

THE BVS 4300 ENCLOSURE for outdoor samplers is made of a durable, heavy-gauge steel or stainless steel, and heat-cured polyester-based powder paint for added corrosion resistance. Security features include a door that locks and a bolted-down instrument panel. For cold weather conditions, samplers can be designed with cabinet insulation and a thermostatically-controlled forced-air heater.

THE ENCLOSURE OF THE PVS 4100 AND 4120 is a molded medium-density linear polyethylene, designed to handle tough environmental challenges and weathering. The hub has an insulated ring and a cavity for crushed ice, giving more control over the temperature of the samples.

THE PVS 4150 ENCLOSURE is manufactured with Hardigg HPX® high performance resin, easy Press & Pull latches and durable soft-grip handles. They are the most comfortable, toughest transport cases available, designed to handle tough environmental challenges and weathering.

EXPLOSIVE ENVIRONMENTS.

Although our sampler enclosures are not explosion proof, the samplers have the capacity to draw from a distance of over 100 feet. Such long draws allow for sampler placement where explosion proof enclosures become unnecessary and add an additional, unwarranted cost.

Portable Samplers

Difficult-to-reach areas like rural streams or sewage systems require the lightest sampler possible. As of 2008, SIRCO proudly offers the lightest portable sampler on the market, weighing a mere 23 pounds.

All SIRCO portable sampler models have been modified over the years to take the best quality samples possible while streamlining the weight. The 4120 and 4150 have smaller pumps and lighter power supplies, hence they are much lighter. For more difficult sampling environments, the 4100 has the standard, larger pump, able to handle larger solids and faster speeds at the water source.

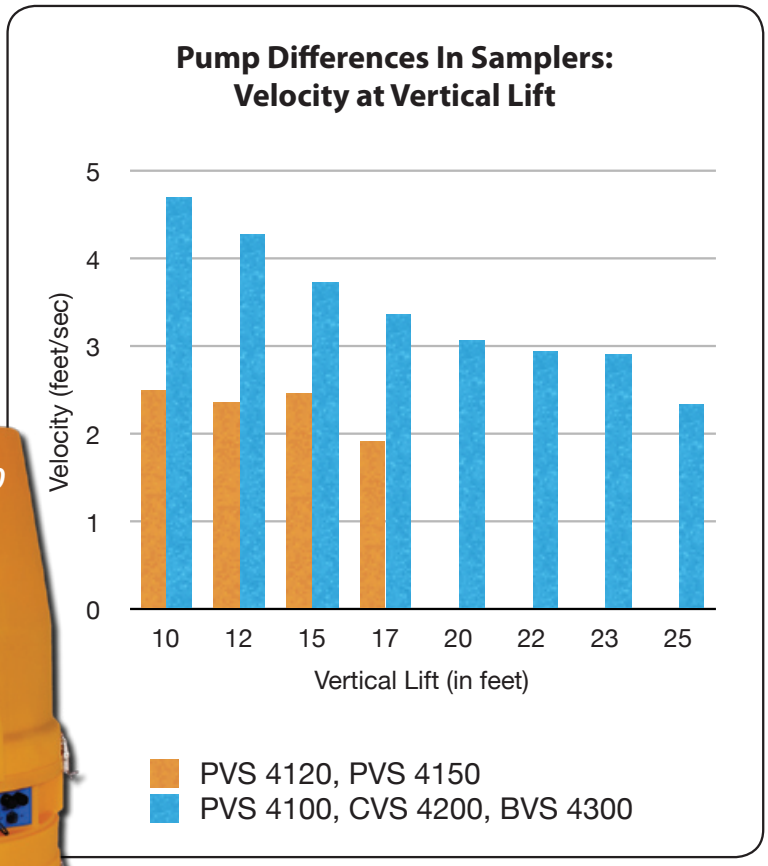
The PVS 4120 is the lightest automatic sampler ever at 23 pounds!

The PVS 4100 has the strongest pump, able to sample over 120 feet away.

The PVS 4150 has an easy-to-transport case with wheels and telescoping handle.

Portable Samplers: How To Pick Your Model

SIRCO portable samplers come in a variety of models designed for variations in weight, pump strength, battery, ease-of-transport, fitting in manholes, discrete or composite sampling, and budgets.



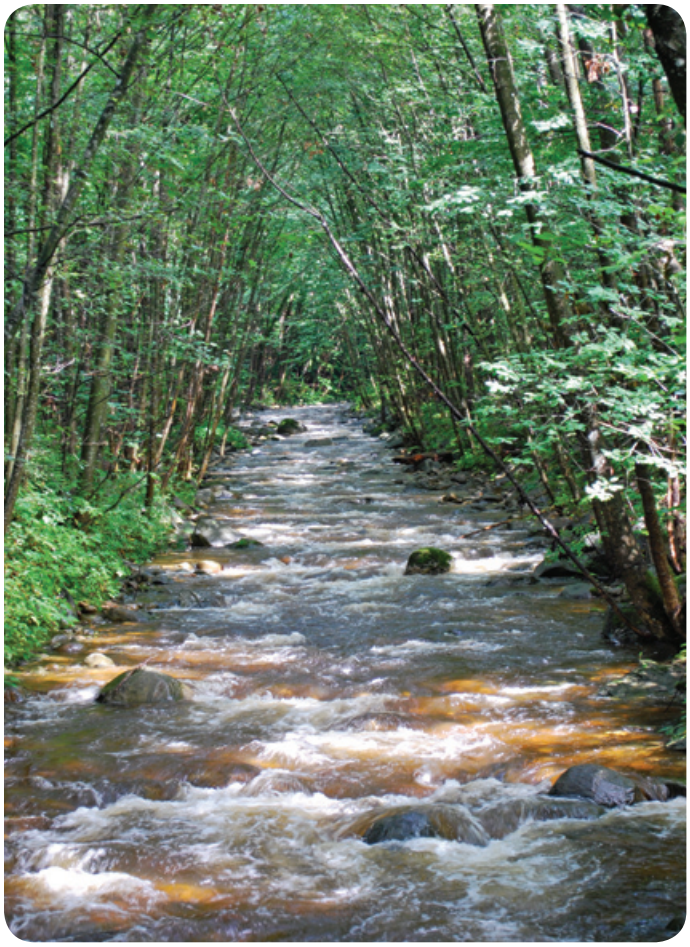
	Pump	Weight (without battery)	Battery*	Total Weight	Ease-of-transport	Discrete Sampling Capability	Cost Differences (Composite)	Manhole Fit Capability
PVS 4100	Large (32-01-01)	26 Lbs 11.8kg	168 hours, 12 Vdc, 17AH (15 Lbs), Sealed Lead-Acid	41 Lbs 18.6kg	Top handle, optional side handles & tilt wheel assembly	Yes	X	Yes, standard-sized manholes
PVS 4120	Small (32-01-40)	23 Lbs 10.4kg	85 hours, 12 Vdc, 7AH (4 Lbs), Sealed Lead-Acid	27 Lbs 12.2kg	Top handle, optional side handles & tilt wheel assembly	Yes	89% of X	Yes, smaller-sized manholes
PVS 4150	Small (32-01-40)	35.5 Lbs 16.1kg	85 hours, 12 Vdc, 7AH (4 Lbs), Sealed Lead-Acid	39.5 Lbs 17.9kg	Handles on all 4 sides, wheels, telescoping handle	No	86% of X	No

* Battery times are how long sampler will last when fully charged, based on composite sampling, once per hour, with 10 second purge time. Note, on the 4120 the larger battery coupled with a small pump would last significantly longer than any of the times on this chart.

Locational Challenges

FAST-MOVING WATER SOURCE

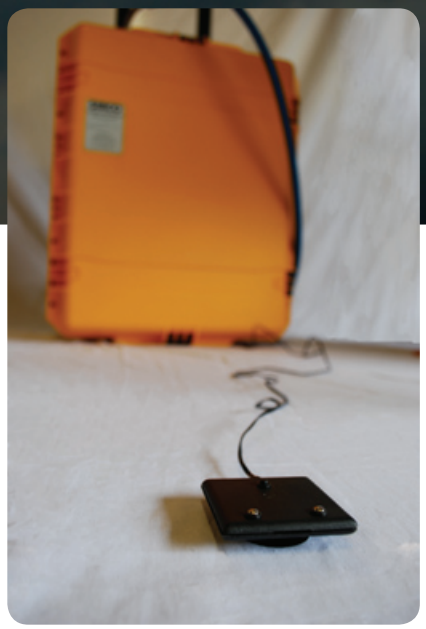
In locations where the water is moving rapidly, samples need to be taken quickly, at speeds in excess of 3 feet/second, to ensure accurate representation of the source water. SIRCO Samplers are capable of taking samples at speeds in excess of 5 ft/second in many circumstances.



PRESSURIZED SOURCE

In locations with a pressurized source, like this Pulp & Paper Mill to the lower right, the pressure will cause backflow into the sampler. SIRCO Samplers are built with a tightly sealed vacuum system, and when used in conjunction with a flow-through elbow or a combination of valves, they can take samples with up to 15 feet of pressure at the source. The SIRCO Sampler to the right has been taking reliable samples at a pressurized source for years.

Stormwater Sampling: First-Flush Water Sensors



FIRST-FLUSH WATER SAMPLING equipment is important to organizations trying to measure the pollution that is flushed out at the first rain. To measure this, the sampling system must detect water and take samples only when water is present.

SIRCO has two systems that can be used to detect water for first-flush sampling.

PRECIPITATION SENSOR: A small moisture sensor is placed within a cylindrical container and positioned in a location which will collect water from precipitation. At the first rainfall, the sensor sends a signal to the sampler, initiating sampling for a set amount of time or until rainfall ceases.

MOISTURE SENSOR: Two probes are attached to the end of the intake tubing. Sampling will take place only when the probes are in contact with moisture. This is useful for sampling at the bottom of a well, or in a dry creek bed, where water is not always present.

Different Models

STATIONARY SAMPLERS

CVS 4200 - Small Fridge
Composite Indoor Sampler

CVS 4200 - Large Fridge
Glass-Door Sampler

BVS 4300 - Outdoor Sampler

PORTABLE SAMPLERS

PVS 4100 - Larger pump,
Discrete & Composite

PVS 4120 - Lightweight model
(23 lbs), Discrete & Composite

PVS 4150 - Easy-to-Transport
Case, Composite Sampling Only

Additional Options

BUILT-IN OPTIONS

- Stainless Steel Intake Hose Strainer
- Time-step Override
- 5/8" Hose Systems: 5/8" in and out; 3/8" in and 5/8" out; 5/8" in and 3/8" out

Portable Samplers

- Stainless Steel Suspension Harness (for PVS 4100 and 4120)
- Moisture Sensor (Stormwater Monitoring)
- Precipitation Sensor (Stormwater Monitoring)
- Tilt-Wheel Assembly (for PVS 4100 and 4120; built-in for PVS 4150)

Stationary Samplers

- Pressure Gauge
- Dual Station (with single or dual controller)
- Glass-Door Refrigerator
- Overflow Protection Probes
- Super-Clean System (MISA); Includes Teflon-Lined Intake Hose, Stainless Steel Sinker Strainer, Teflon Metering Chamber Cover, Silicone O-Ring, Pyrex Metering Chamber, and Silicone Discharge Tube
- External Valve Control Output
- Pull-out Tray (outdoor models)
- Insulation (outdoor models)
- Heater With Thermostat (outdoor models)

EXTERNAL OPTIONS

- Flowmeters
- Data Logging
- Dupline System: control sampler & data log remotely, up to 4km away.
- Floats & Sinkers (for intake line)

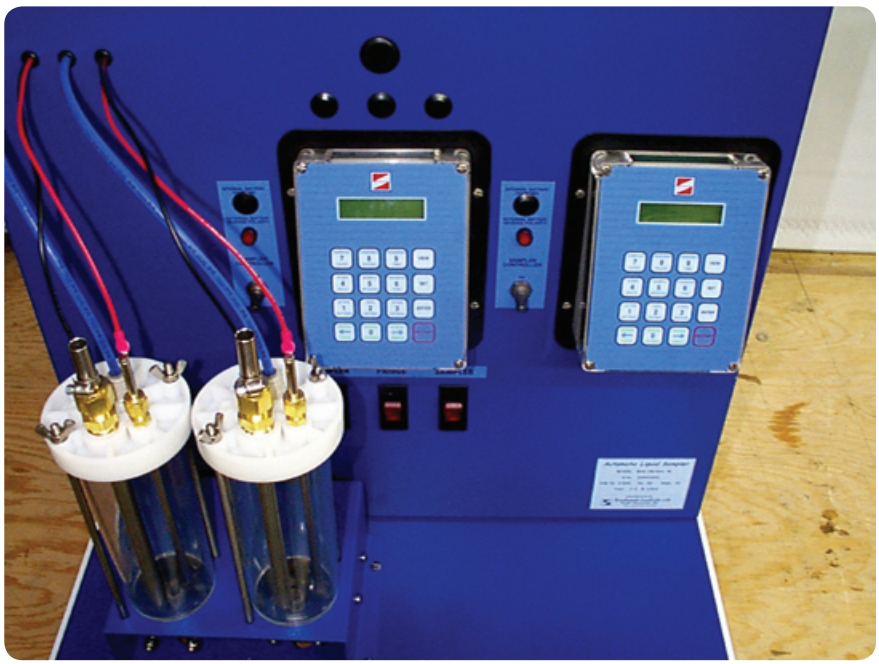
All samplers accept most inputs from industry standard flow meters & data loggers.

CUSTOM OPTIONS

All samplers can be modified or custom-built to fit particular challenges.

Previous customers' custom options:

- Circulation Fans
- Pressurized Systems
- Mini Fridge
- Extended Base



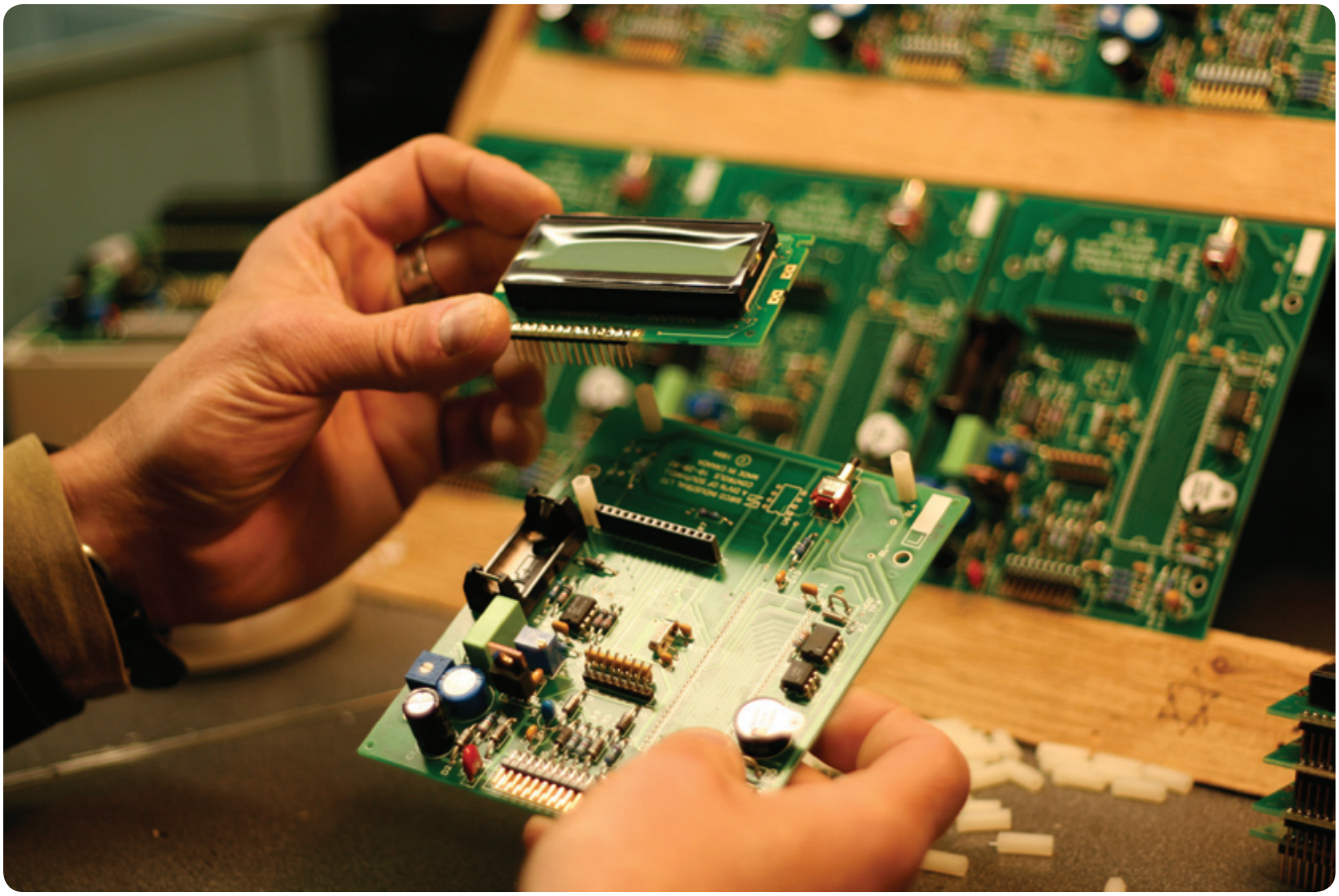
Warranty

THREE YEAR WARRANTY

SIRCO Samplers are so reliable, we can offer the industry-leading warranty: three full years for parts and repairs (one year for the refrigerator). This is the standard warranty on all new samplers, and covers breakdowns under normal use.

EXTENDED WARRANTY

The warranty can be extended up to five (5) years for an additional fee. This includes any manufacturer's defects or breakdowns from normal wear-and-tear. The extended warranty does not cover damage done to samplers due to external sources, and does not cover the refrigerator.



History

SIRCO Samplers had their beginning in 1960 in the UK, making some of the first automatic water sampling equipment in the world.

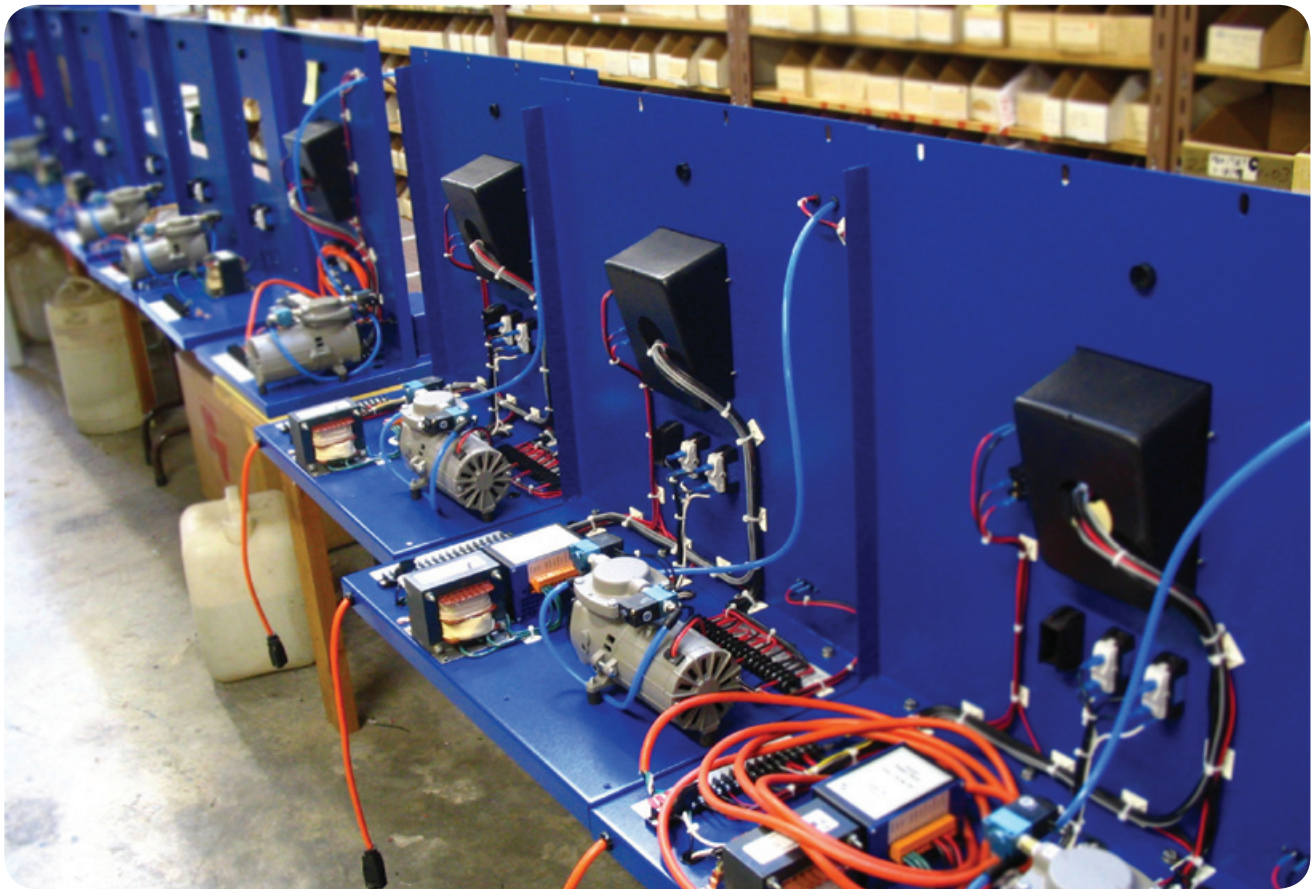
In the 1970s, SIRCO came to North America manufactured by Southwell Controls Ltd.

Major improvements were made to the samplers **in the 1980s**, in particular the introduction of the Multi-Function Input Controller.

In 2004 Southwell came under new ownership, current president Rick van Rikxoort, and the samplers underwent a series of upgrades to improve components to 21st century standards, like the power packs, controller, and stepper assembly. This was the beginning of the 4000 Series Samplers.

A new partnership with Mike "Gusto" Mikalian began **in early 2008**, and under Mike's leadership and technical background SIRCO samplers advanced in greater improvements to meet the new demands of customers, including features like light-weight portables and a glass-door fridge, as well as improvements in the power supply and variations in the pumps for different needs.

SIRCO today is sold under Southwell Corp, using the same foundations from 50 years ago, but with modern improvements and technologies that have made them streamlined and up-to-date for today's discerning user.



Users List

SIRCO Samplers are in use all over North America. Here's a small sampling of our users list.

1970s

City of Edmonton, AB
Prince George Pulp & Paper, BC
Fed. Gov. Dept. Fisheries & Oceans, BC
Napa Sanitation Dist., CA
L.A. County Sanitation Dist., CA
Metro Denver, WWTP, CO
IBM, CO
John Deere Tractor Works, IA
Oscar Meyer Co., IA
Pabst Brewing Co, IL
Champagne WWTP, IL
University of Purdue, IN
Amhurst WWTP, MA
Boston Edison Co, MA
Steel City Piping, MI
Pontiac Motor Division, MI
Ford Motor Company, MI
Marigold Foods, MN
Consolidated Bathurst, NB
Moore County WWTP, NC
City of Lebanon, NH
Passiac Valley, Newark, NJ
Exxon USA, Bayway Refinery, NJ
Scott Maritimes, NS
City of Halifax, NS
Clarke Cnty Sewer Dist. Las Vegas, NV
Niagra Falls STP, NY
Stevens Painter Group, OH
Cleveland Southerly WWTP, OH
City of Woodstock, ON
Steel Co. of Canada, ON
Spruce Falls Pulp and Paper, ON
Ontario Hydro, B. Generating Stn, ON
Nabisco, ON
City of Portland, OR
Montreal Urban Commision, QC
Abitibi Price, QC
Houston Water Dist. Mgmt, TX
Armco Steel Corp., TX
Fairfax WWTP, VA
Spokane STP, WA
Seattle (Metro), WA
City of Milwaukee, WI
Madison (Metro), WI
Schlitz Brewing Co, WI

1980s

Shell Canada, AB
City of Edmonton, AB
City of Calgary, AB
Western Pulp Partnership, BC
Fibreco Pulp Inc., Taylor, BC
Greater Vancouver Dist, BC
MacMillan Bloedel, BC
Orange County, CA
L.A. County Sanitation Dist., CA
City of Los Angeles, CA
IBM, WWTP, San Jose, CA
John Deere Foundry, IA
Idaho Frozen Foods, ID
Goldine Electronics, IL
Gilette Company, N. Chicago, IL
Revere Copper & Brass, IL
OMC Johnson, Waukegan, IL
Huntley WWTP, IL
Reynolds Inc., Kentland, IN
Briggs & Stratton, Murray, KY
Boots Pharmeceutical, LA
City of Fitchburg, MA
Wyeth Laboratories, MI
City of Mason, MI
Bemidji WWTP, MN
Consolidated Bathurst, NB
Superbrand Dairy, Highpoint, NC
Oxford WWTP, NC
Northeast Regional STP, Lincoln, NE
Cornerbrook Pulp & Paper, NF
Monsato Research, Miamisburg, OH
Novacor Chemicals Ltd., Sarnia, ON
Ministry of the Environment, ON
City of Salem, OR
Quebec Pulp Mill, QC
Domtar, Windsor Mills, QC
Agropur Cooperative, Granby, QC
MTM Chemicals Inc., Rockhill, SC
Dept. of Energy, Oakridge, TN
City of Spokane, WA
Georgia Pacific Corp., WA
Boeing Inc., Kent, WA
Twin Town Cheese, Alamena, WI
Marshall Products Ltd., WI
Briggs & Stratton, WI

1990s

City of Edmonton, AB
Daishowa Marubeni Inc., AB
Shell Canada, AB
L.A. County Sanitation Dist., CA
Powell River, BC
Greater Vancouver Dist., BC
Fleismans Yeast, BC
Environment Canada, BC
Rogers Sugar, BC
City of Livermore, CA
City of Los Angeles, CA
L.A. County Sanitation Dist., CA
IBM, WWTP, San Jose, CA
Weyerhauser, CA
Iowa Hills WWTP, CO
Metro Wastewater, CO
Metro Denver Reclamation, CO
City of Warner Robins, GA
Abbott Labs, IL
Barber Coleman Company, IL
Citizens Utilities of Illinois, IL
Universal Foods Corp, IL
Indiana Construction, IN
Town of Kentland, IN
Charles River Pollution, MA
City of Fitchburg, MA
Wells Sanitary District, ME
Knouse Foods, MI
Wyeth Labs, MI
Fontana Village, NC
Stockhausen Inc., NC
Cornerbrook Pulp & Paper, NF
Sun Refining & Marketing, OH
Cambridge Galt Sewage, ON
Ministry of the Environment, ON
Ontario Clean Water, ON
Wellington Construction, ON
Mike Becker Construction, OR
Port of Morrow, OR
Yamasa Wastewater, OR
O.M.I. Inc., Allentown, PA
City of Spokane, WWTP, WA
Georgia Pacific Corp., WA
Metro Seattle, WA
Oscar & Mayer Food Corp, WI

2000s

Alberta Distillers, AB
Alberta Newsprint, AB
City of Edmonton, AB
City of Calgary, AB
Shell Canada, AB
Abitibi-Consolidated, BC
Chevron Canada, BC
Greater Vancouver Dist., BC
MB Paper, BC
Pacifica Papers Inc., BC
Cecchetti-Sebastine Winery, CA
City of Livermore, CA
IBM Corp., CA
Napa Sanitation, CA
Iowa Hills WWTP, CO
Metro Wastewater, CO
City of Warner Robins, GA
Systematic Controls, GA
Franklin Grove WWTP, IL
Roquette Corporation, IL
Rose Packing Co., IL
Town of Kentland, IN
City of Fitchburg, MA
Upper Blackstone WPAD, MA
Repap Manitoba, MB
Wells Sanitary District, ME
Knouse Foods, MI
Irving Paper, NB
Stone Container, NB
Deere-Hitachi, NC
Blue Springs Golf Club, ON
Corbett Creek WPCP, ON
Mine Waste Management, ON
Stratford, OCWA, ON
City of Joseph, OR
Smurfit Newspaper, OR
Coca-Cola, PA
Lehigh County WWPTP, PA
Agropur, QC
Aliments Ultima Foods, QC
Domtar Papers, QC
Parker Hannifin, SC
King County WWTP, WA
Manchester WWTP, WA
Tosco Refining, WA

Reference Statements

"The Metro District…has been using SIRCO vacuum type samplers for as many as 37 years… with very few problems. The folks at Southwell have responded to our needs very quickly and professionally. I am very pleased with the SIRCO samplers and would recommend them to anyone."

-- Leroy Gonzales
Transmission Supervisor
Metro Denver Wastewater
Reclamation District

"The simpler they are, the easier they are to maintain... We've had good longevity with them. Parts are available, and they are easy to maintain."

-- Bob Wilson
E & I Superintendant
Harmac Pulp Operations
Nanaimo, BC

"We've been using SIRCO Samplers in multiple plants for many years. We have no problems with them whatsoever. They're reliable and excellent quality. I'd recommend them to anyone."

-- Jeff Lang
Plant Supervisor
Region of Durham

How SIRCO Samplers work: Basic Sampling

SIRCO Samplers can be used to take samples manually or can be set up to take samples automatically.

Automatic Samples
To begin a new, quick program:

- Press "SET"
- Press "NEW ENTRIES" (2 on keypad)
- Press "ENTER"
- **START DELAY** (Select how you would like to delay the sample program until certain external conditions are met: DISABLE; TIME/DAY; PULSE INPUT; 4-20mA INPUT; EXTERNAL CONTACT; LEVEL CONTROL).
- Select, using arrows, which parameter you would like, and adjust settings. Press "ENTER" twice.
- **SAMPLE INITIATION** (parameters for frequency of samples, with the following options: DISABLE; INTERVAL TIME; PULSE INPUT; 4-20mA INPUT; EXTERNAL CONTACT).
- Select, using arrows, which parameter you would like, and adjust settings. Press "ENTER" twice.
- **PROGRAM TYPE** (how sampler will perform program, with options: COMPOSITE; MULTI-COMPOSITE; CONSECUTIVE; DAILY CYCLE; TIMED STEP (override)).
- Select, using arrows, which parameter you would like, and adjust settings. Press "ENTER" twice.
- **PURGE TIME** (set how long sampler will purge between samples, minimum of 10 seconds).
- Press "ENTER"
- Press "RESTART" twice.

Sampling is ready to go.

To view the program or remaining time, press the "VIEW" button, followed by the button representing what you want to see, e.g. "REMAINING TIME".

To modify any of the settings individually press the "SET" button followed by the appropriate button based on what parameter is being changed.

Manual Samples
To take a sample manually, simply press the "Manual Sample" button twice. Manual samples will not interrupt the current automatic sampling program.

For complete instructions refer to the manual on the CD or online.

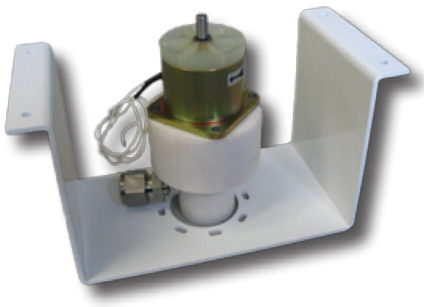
Upgrades From Pre-4000 Series

The 4000 Series SIRCO Samplers have been redesigned and upgraded from previous models. Most parts and upgrades are backwards-compatible, designed to retro-fit older sampling units. These are a few of the most important upgrades.

Multi-Function Controller

Part: 30-DC-MFCB or 30-AC-MFCB

The 4000 Series Multi-Function Controller features easy-to-use instructions, 16 key touchpad, and 2x16 character backlit LCD. Featuring a real-time clock, it is able to control sample initiation based on a number of different criteria and is programmable with a variety of different sample sequences. It also features an internal lithium battery to maintain program settings and information in the case of power failure.



Stepper Assembly

Part: 32-05-01 (stepper motor); 32-04-01 (teflon distributor)

The stepper assembly unit is the arm which distributes samples used in discrete sampling. Recent changes and upgrades have helped prevent leaks, decrease on wear, and increase the life and performance of the unit. (Picture shown also includes stepper bracket.)

Power Pack Upgrade Kit

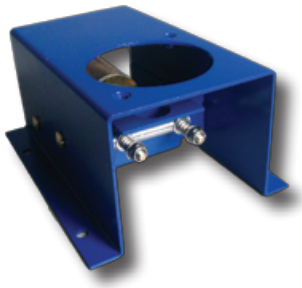
Part: 15-06-78

The 4000 series battery has gone through rigorous testing and improvements, particularly in regards to the cooling system. Whereas the previous system of cooling was convection, now the system includes both convection and forced air (fan), of particular importance in some sampling situations with high levels of waste heat. Also the body has been upgraded from plastic to metal, increasing reliability.

Teflon Metering Chamber Cover

Part: 50-21-06

In toxic or MISA-type sampling environments where a teflon cover is needed rather than the standard nylon, warping can occur, which will lead to leaks. This new cover for the metering chamber has a powder-coated aluminum reinforcing ring and stainless steel fittings, preventing warping and providing an even pressure.



Pinch Valve Assembly

Part: 50-02-13 (normally open)

Pinch valves are integral to controlling the sampling flow, releasing the sample from the metering chamber to the specified bottle(s) below. Tthe solenoid plunger has been given an extra coating, to increase durability.

Metering Chamber

Acrylic: *Standard*

Glass (pyrex): *for MISA-type applications and reduced contamination of the sample*

Part: 24-01-01 Acrylic, 3/8", taper style, 500cc
Part: 24-01-02 Acrylic, 5/8", tube style, 500cc
Part: 24-01-03 Acrylic, tube style, 1000cc
Part: 24-01-08 Pyrex, 3/8", 500cc
Part: 24-01-09 Pyrex, 3/8", 1000cc
Part: 24-01-10 Pyrex, 5/8", 500cc
Part: 24-01-11 Pyrex, 5/8", 1000cc

Customer Support

For all your technical questions or concerns,
please contact us at the information below.

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Canada East 1047 Hedge Dr. • Mississauga, ON L4Y 1G3

Manufactured by:
SouthwellCorp
PRODUCTS THAT LAST

Find more relevant information on the web!
Visit *sircosamplers.com* for web specials and product updates.

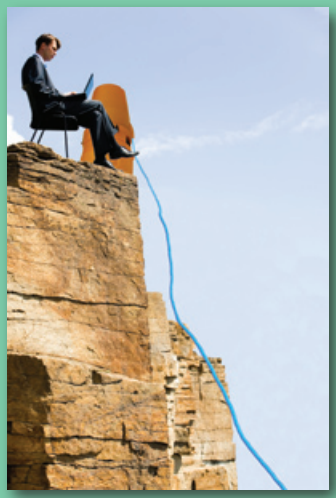
BENEFITS OF SIRCO SAMPLERS

SPEEDS

The EPA recommends that water samples should be taken in excess of 3 ft/sec in order to accurately represent the water. Most automatic samplers struggle to keep up, displaying misleading stats like 3.3 ft/sec, but with fine text that they're measuring only the first three feet of intake tubing. SIRCO patented vacuum technology is capable of sampling at speeds in excess of 5 ft/sec!

VERTICAL LIFTS

The greater the lift, the slower the sample speed. Most samplers on the market can only manage 2 ft/sec when drawing on a 3/8 inch tube at 15 feet of vertical lift. SIRCO samplers can pull at **3.7 ft/sec with 15 feet of vertical lift!**

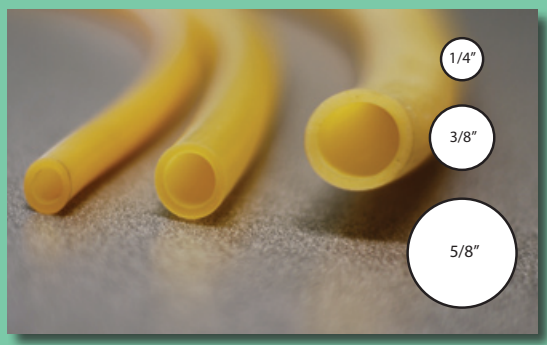


Samples can be taken almost anywhere with lift power up to 28 feet and horizontal draw over 120 feet.

LONG-LASTING PARTS

Most sampling equipment requires replacement parts every few weeks. More breakdowns means more interruptions in sampling and less accurate results, not to mention hassle and upkeep costs. Unlike peristaltic pumps, SIRCO vacuum parts last for years!

LARGE SOLIDS



At locations with solids in the wastewater, a large diameter intake tube is needed to produce more accurate results. Most samplers typically use a 1/4 inch tube, and a max of 3/8 inch. SIRCO can support up to 5/8 inch! This collects larger specimens and reduces the risk of blocking the intake line.

LIGHT-WEIGHT NEEDS

Difficult-to-reach areas like country-side streams or sewage systems demand using the lightest sampler possible. As of 2008, SIRCO proudly offers the lightest portable sampler on the market, weighing in at 23 pounds!!! All SIRCO portable sampler models have been modified over the years to take the best quality samples possible while streamlining the weight.

The PVS 4120 is the lightest automatic sampler ever at 23 pounds!

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