TELEDYNE ISCO
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SAMPLER SOURCE BOOK

AUTOMATED WATER SAMPLING

ISCO

Teledyne ISCO Samplers

Teledyne ISCO Samplers set the stage for being first in many categories. Our advances include the first non-contacting liquid detector, first outdoor refrigerated sampler, and first sampler with interchangeable modules for measuring flow and parameters. Through listening to our customers, innovation, continuous improvement, emphasis on quality and reliability, Teledyne ISCO continues to lead the way with samplers for every application:

- Industrial pretreatment compliance monitoring
- Storm water runoff monitoring
- CSO (combined sewer overflow) monitoring
- Regulatory compliance monitoring
- Water quality research
- Specialized applications such as monitoring for radio nuclides
- Surveillance for WBE/PFAs/Opioid

Integrated Manufacturing

Our in-house design, manufacturing, and assembly team assure consistent quality and superior performance. You can depend on Teledyne ISCO products.

Worldwide Sales and Service

Friendly, knowledgeable help is available in more than forty countries. Contact us today to arrange a consultation or product demonstration.

Rental

The ideal way to avoid large capital outlays for short-term projects. Whether you need one sampler or fifty, Rental offers competitive rates and fast delivery.

Sampler Selection Guide

Sampler Model												
Applications	**Portable**						**Refrigerated**				**Portable Refrigerated**	
	GLS	3700	3710	3700C	6712	6712C	5800	6712FR	Platinum™	Optima	Avalanche®	Glacier®
WWTP	X	X	X	X	X	X	X	X	X	X		
Collection Systems	X	X	X	X	X	X					X	X
Water Quality Monitoring												
Stormwater					X	X		X			X	
TMDL					X	X		X			X	
Watershed					X	X		X			X	
Resource Water					X	X		X			X	
River Monitoring					X	X		X			X	
Sampler Accessories												
Flow-Through Chamber	X	X	X	X	X	X	X	X	X	X	X	X
674 Rain Gauge					X	X		X			X	
700 Modules					X	X		X			X	
Pressurized Line Sampling					X	X		X			X	
1640 Liquid Level Actuator	X	X	X	X	X	X	X	X			X	X
Locking Harness		X	X	X	X	X					X	X
Suction Line & Strainer	X	X	X	X	X	X	X	X	X	X	X	X
Street Level Tools												
Suspension Harness	X	X	X	X	X	X						
ProHanger™	X	X	X	X	X	X						
Street Level Installation Tool					X	X		X			X	
Data Handling												
Flowlink® Software					X	X		X			X	
6712Ci Cellular					X	X		X			X	
581 RTD					X	X		X			X	
Land Line Modem					X	X		X			X	
2105 Interface Module	X	X	X	X	X	X	X	X			X	X
Power Products												
Batteries	X	X	X	X	X	X						
Solar Chargers	X	X	X	X	X	X					X	X

5800 SAMPLER

Stationary Refrigerated Sampler

The 5800 Refrigerated Sampler is Teledyne ISCO's answer to the rigorous demands of water monitoring. With user-friendly controls and workplace-savvy features, the 5800 is the only choice for stationary sampling in both municipal and industrial wastewater applications.

All Weather and Corrosion Protection

The 5800's UV protection ensures product longevity and reliability, while the tough double-wall LLDPE construction is designed to withstand the harshest outdoor environments without requiring a protective enclosure.

The insulated refrigerator with high efficiency 1/6 HP compressor keeps samples cool in hot, humid conditions and the interior heaters keeps samples from freezing in cold conditions.

Modular Design for Easy Servicing

- Control Panel
- Pump Assembly
- Distributor Assembly
- Refrigeration Assembly
- Power Supply Assembly

Standard Features

- Composite and sequential sampling
- -20 ° to 120 °F operating temperature range
- Four digital alarm outputs
- 4–20 mA flow meter input

- Weight: (dry) 184 lbs. (83.5 kg)
- Dimensions: (H x W x D) 52 x 28 x 33 in (132 x 72 x 84 cm)
- Operating Temperature: 32 ° to 120 °F (0 ° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

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PLATINUM™/OPTIMA

Stationary Refrigerated Sampler

The Platinum and Optima vacuum samplers from Teledyne ISCO are a heavy duty, all season refrigerated composite/sequential wastewater sampler. With a fiberglass base and body, the all season units are suitable for corrosive environments and severe outdoor/indoor conditions.

These vacuum pumps exceed EPA transport velocity requirements and generate a stronger purge. The Platinum and Optima samplers collect specified volumes of water at programmed times or flow intervals and deposits them into refrigerated composite or sequential sample containers.

Their piston vacuum pumps provide long-term consistent sampling with vertical lifts of up to 28 feet (8.5 m), with no need to frequently replace the internal tubes. With a powerful pump, the sampler can draw a sample from a longer distance.

Vaccum Pump Technology

- 110/220 Vac
- In-door/out-door use
- Volumetric (CVE) and Gravimetric (QLS) sample volume control
- Composite and sequential sampling
- -20 ° to 120 °F operating temperature range
- Flow inputs: pulses, 4–20 mA, 0–10 Vdc, 0–5 Vdc

Platinum

- Composite and sequential sampling—wide choice for bottle configurations

Optima

- Composite and sequential sampling with 24 bottles

- Weight: (dry) 190 lbs. (86.2 kg)
- Dimensions: (H x W x D) 49 x 25.5 x 25.5 in (124 x 65 x 65 cm)
- Operating Temperature: -20 ° to 122 °F (-29 ° to 50 °C)
- Controller Rating: NEMA 4X, 6 IP66

3700 AND GLS SERIES SAMPLERS

Portable Sampler

3700 Full Size Sequential/Composite Sampler

Our full-featured 3700 Sampler collects sequential or composite samples based on time or flow. The full-size 3700 sampler is ideal for general purpose sampling and offers features for most applications.

This sampler is also offered with a jumbo base to allow for larger single bottle sampling volumes.

- Weight: (dry) 37 lbs. (16.8 kg)
- Dimensions: (H x D) 25.25 x 19.88 in (64.1 x 50.5 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating NEMA 4X, 6 IP67

3700C Compact Sequential/Composite Sampler

The 3700C is ideal for moving from one site to another. Its small size and weight allows for easy installation into 18- inch (0.46 meter) diameter manholes without disassembly or awkward maneuvering.

Our unique bottle carrier for sequential sampling makes bottle changing quick and easy.

- Weight: (dry) 25 lbs. (11.3 kg)
- Dimensions: (H x D) 27.75 x 17.75 in (70.5 x 45 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

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3710 Full Size Composite-only Sampler

Economical 3710 Samplers provide composite sampling only, delivering savings where sequential sampling isn't needed.

- Weight: (dry) 32 lbs. (16.8 kg)
- Dimensions: (H x D) 28.75 x 19.25 in (73.3 x 48.9 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating NEMA 4X, 6 IP67

GLS Composite

Teledyne ISCO's smallest sampler, the GLS composite sampler delivers full-size sampling capability and goes where standard samplers won't. Its tapered design slips easily in and out of small or offset manholes.

- Weight: (dry) 24.5 lbs. (11.1 kg)
- Dimensions: (H x D) 26.5 x 16.5 in (67.3 x 41.9 cm)
- Operating Temperature: 32 ° to 120 °F (0° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

**Patent 5,125,801*

6712 SERIES SAMPLERS

Since their introduction, Teledyne ISCO's 6700 Series Samplers have set the industry standard for performance, reliability, advanced features, and ease of use.

6712 Samplers offer "plug and play" sampling and data logging, compatible with a variety of equipment and allowing you to get the most from your sampling budget.

Superior Sample Delivery With Our High-performance Peristaltic Pump

The 6712 pump delivers samples at U.S. EPA-recommended 2.0 f/s (0.61 m/s), even at head heights of 25 ft (7.6 m). At a 3 ft. head, line velocity is 3.1 f/s (0.94 m/s).

Our pump revolution counter assures consistent sample volumes, even when battery power is low, and is used to notify you when pump tubing should be replaced. An exclusive safety interlock automatically disables the pump when you change tubing.

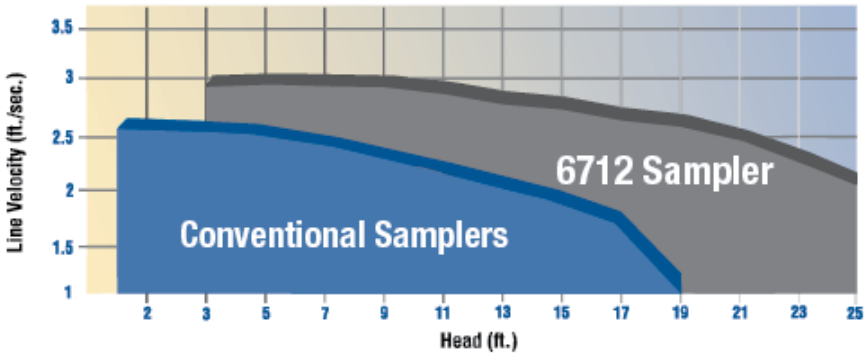
LD-90 Liquid Detector

This patented* non-contacting detector ensures that sample volumes are precise and repeatable–regardless of head height variation. Upon liquid detection, sample volume is metered by our pump revolution counter.

*Patent # 5,125,801

- Expand your monitoring capabilities with plug-in modules for flow, pH, and other parameters.
- Get accurate, repeatable samples with exclusive delivery system.
- Benefit from multi-parameter capabilities and data logging.

Pump Performance Comparison



The 6712 pump is not as affected by varying head heights as other samplers. From one sample to the next, the 6712 pump eliminates variability in sample content due to inconsistent sample velocities.

Get the advantages of "Smart Monitoring" with these 6712 capabilities.

Versatile Programming

Teledyne ISCO 6712 Standard and Extended program modes allow efficient setup for virtually any application:

- Stormwater monitoring
- CSO and SSO monitoring
- Regulatory compliance
- Enforcement monitoring
- Data logging

And with the 6712, on-line programming help is just a keystroke away.

Standard Program Mode

Quickly select the desired parameters and sampling sequence from the simple step-by-step menu.

Choose:

- When to start
- Sample distribution
- Volume to collect
- Time- or flow-pacing

In continuous sampling mode, just replace filled bottles with empty ones.

Extended Program Mode

Easily enter complex programs for unique applications. Actuate via plug-in modules, rain gauges, or multi-parameter sondes. Store up to 5 different sampling programs.

Available routines include:

- Pause and resume for intermittent discharge flow monitoring
- Sampler pacing by time, non-uniform time, flow, or external event
- Flow-weighted sample collection
- Two-part programming to enable and sample in two different modes

Integrated Water Monitoring

Teledyne ISCO 6712 Samplers feature "Plug-and-Play" connection for and other SDI-12 sensors. Use inputs from up to ten separate sensors for flexibility in logging data and triggering sample collection.

Data Logging

The 6712 functions as a data logger while connected to various Teledyne ISCO measurement devices, SDI-12 sensors, or thru the 780 smart module. Data can be retrieved using Flowlink software for data analysis.

Get integrated measurement and reporting capabilities for:

- TMDL monitoring
- Stormwater runoff
- Rivers, lakes, and estuaries
- Non-point source pollution
- Combined sewer overflow
- Wastewater influent/effluent
- Industrial enforcement monitoring

6712 SERIES SAMPLERS

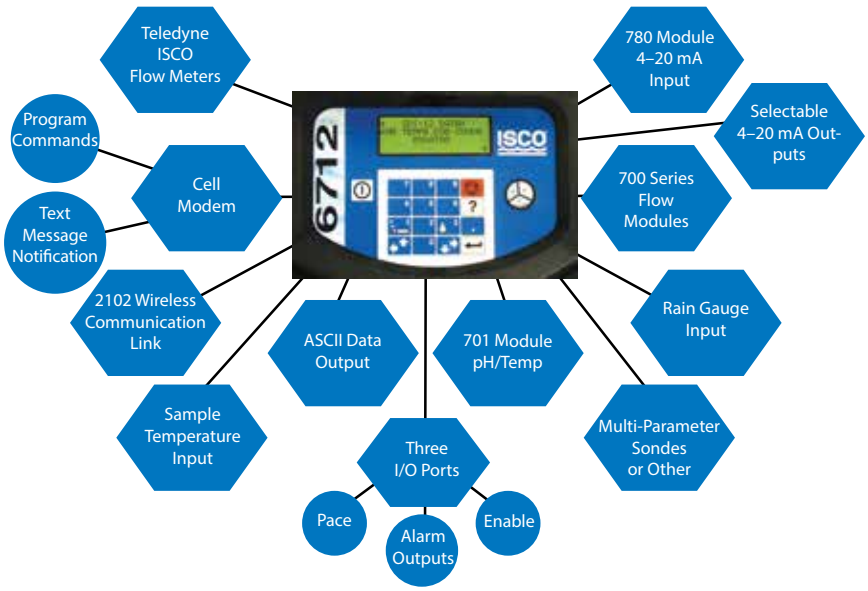
Continued

6712FR Stationary Refrigerated Sampler

You get proven protection from exposure to hostile environments—indoors or out. The exterior is custom molded from polyester resin fiberglass. UV-resistant gel coat provides a smooth finish for easy cleaning and protection from the sun.

An automatically controlled, built-in heater, prevents sample freezing down to -24 °F (-31 °C) and provides frost-free operation. A solid-state thermostat and three temperature sensors monitor interior and ambient air as well as the evaporator plate for absolute temperature control. Optional temperature logging displays real-time temperature and stores periodic readings for later retrieval. Thick, foamed-in-place insulation guarantees properly preserved samples. The rugged stainless steel framework and refrigeration components are protected by polyester tubing, phenolic paint, or polyester powder coating. An optional controller heater can be added to insure uninterrupted operation down to -20 °F (-29 °C).

- Weight: (dry) 160 lbs. (73 kg)
- Dimensions: (H x W x D)
  49.3 x 26 x 26 in
  (125 x 66 x 66 cm)
- Operating Temperature:
  32° to 120 °F (0° to 49 °C)
- Controller Rating:
  NEMA 4X, 6 IP67



6712 Full Size—Portable Sampler

The 6712 Sampler offers the most versatility for many sampling applications. Twelve bottle configurations facilitate all types of monitoring.

The 6712 holds up to 30 pounds (13.5 kg) of ice in its fully insulated base.

Note: Also available with jumbo base for use with 5- and 5.5-gallon bottles.

- Weight: (without bottles, battery or ice) 32 lbs. (15 kg)
- Dimensions: (H x D) 27.0 x 19.96 in (68.6 x 50.7 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

6712C Compact—Portable Sampler

The 6712C is ideal when you require advanced capabilities in a smaller sampler. Its tapered design allows it to easily maneuver through small or offset manholes.

This compact sampler also uses our convenient bottle carrier system—which provides faster and easier bottle exchange. Simply remove the carrier from the base, and replace it with another. It is also a safe and convenient way to transport your samples to the lab.

Optional Bottle Carrier

- Weight: (without bottles, bottle carrier, battery, or ice) 31 lbs. (14 kg)
- Dimensions: (H x D) 27.6 x 17.75 in (70.1 x 45.1 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

PORTABLE REFRIGERATED SAMPLERS

Glacier® Composite Sampler

The compact size, light weight, and mobility of a portable without the need for ice.

Its power-saving cooling system is set to standby until the first sample is drawn. Glacier will wait patiently for days—or weeks—to collect event-triggered samples, then preserve them until a convenient pick-up time.

You can expect 48 hours or more of refrigeration time from a 12 Volt deep-cycle battery.

Glacier shown with mobility cart option.

- Weight: (dry, less battery) 60 lbs. (28 kg)
- Dimensions: (H x W x L) 25 x 15 x 24 in (63 x 38 x 60 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

Avalanche® Multi-bottle Sampler

The Avalanche is based on industry-leading 6712 controller, so in addition to its power-saving standby feature, you can set and run a variety of sampling programs.

Samples are accurately preserved at 4 °C, even under the most difficult conditions.

The cooling compartment accepts configurations ranging from a single 5- or 2.5 gallon bottle to four 1-gallon, or fourteen 950 mL containers.

Avalanche shown with mobility cart option.

- Weight: (dry, less battery) 76 lbs. (35 kg)
- Dimensions: (H x W x L) 30.5 x 14 x 24 in (78 x 36 x 60 cm)
- Operating Temperature: 32° to 120 °F (0° to 49 °C)
- Controller Rating: NEMA 4X, 6 IP67

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700 SERIES
Plug-in Modules

701 pH and Temperature Module
Accurate pH and temperature monitoring in a single module. Activate your 6712 Sampler at user-selected pH or temperature ranges and save by collecting and analyzing only samples outside normal parameters.

720 Submerged Probe Flow Module
A differential pressure transducer provides accurate measurement where wind, steam, foam, turbulence, or air temperature fluctuations exist—even if the probe gets covered with silt or sand.

Plug-in Modules
700 Series Modules let you add flow measurement, pH, or intelligent analog input to your 6712 Sampler.

6712 Sampler logs the data for later retrieval or view parameter data on the display. Data includes summaries, flow rate, level, pH, and temperature, along with sampling status. Parameters can be used to trigger sampling programs or sample pacing.

730 Bubbler Flow Module
Unaffected by changing stream conditions, the 730 delivers accurate level measurement despite temperature fluctuations and exposure to harsh chemicals.

Choose standard or low-profile

750 Area Velocity Flow Module
Get accurate measurement where weirs and flumes aren't practical—or where submerged, full-pipe, surcharged, and reverse flow conditions may occur. No need to estimate channel slope or roughness. Sensor uses patented* Doppler technology to directly measure average flow velocity.

780 Analog Input Module
Add intelligent interpretation of any 4–20 mA signal. Characterize analog signals as flow rate or percentage of full scale. Pace or trigger your 6712 Sampler, and store data for retrieval and analysis.

*Patent # 5,371,686

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DATA MANAGEMENT

Data Retrieval and Reporting

The 6712's large memory allows you to capture a large amount of sampling and parameter data that can be retrieved by various methods. You can retrieve your program settings for spot checking and chain-of-custody documentation.

Telephone Modem

This modem lets you initiate sampling routines or change programs, have the sampler call you for user-programmable alarm conditions, and retrieve data (using Flowlink software).

6712Ci Cellular Modem Capability

Teledyne ISCO offers cellular communication for 6712 and Avalanche Samplers located in remote or difficult-to-access areas. This 6712Ci cellular modem allow samplers to transmit text message alarms to a text-enabled phone or pager, and to communicate with an internet-enabled PC for remote data retrieval and control.

Specific contact times can be programmed allowing energy saving features to power down the system during the "off" times, without affecting alarm notification ability.

581 Rapid Transfer Device

A durable alternative to exposing vulnerable laptops in the field is our pocket-sized RTD. Simply plug it into the port on a 6712 Sampler—or other instruments—and level, rainfall, water quality, and sampling data are quickly transferred to the device.

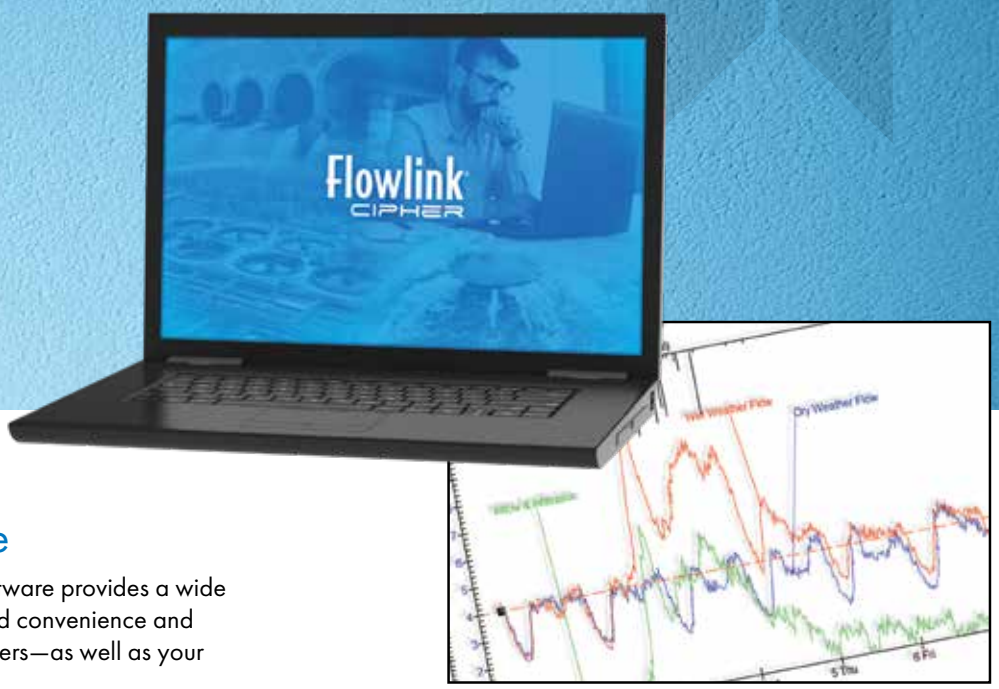
Its flexible memory has storage for over 900,000 bytes of data—typically enough to retrieve data from 2 samplers.

2105 Interface Module

The 2105 Interface Module records data from Rain Gauges, and other SDI-12 devices, Flow Meters, and devices with Modbus and analog outputs. The 2105 can also take ASCII inputs from 6712 automatic samplers.

The 2105 monitors recorded data and takes intelligent actions, such as sampler enabling and pacing, as well as alarm generation based on user-specified conditions. Recorded data can be output via Modbus and/or 4–20 mA.

The 2105 offers remote communication for CDMA, and GSM cell phones (other communication devices require an additional module.) It provides a powerful, yet easy, solution for environmental studies that require interfacing of multiple instruments and common communication platforms.



Flowlink® Data Management Software

The industry's premier data handling software provides a wide variety of advanced capabilities that add convenience and value to the 6712 and Avalanche Samplers—as well as your entire water monitoring program.

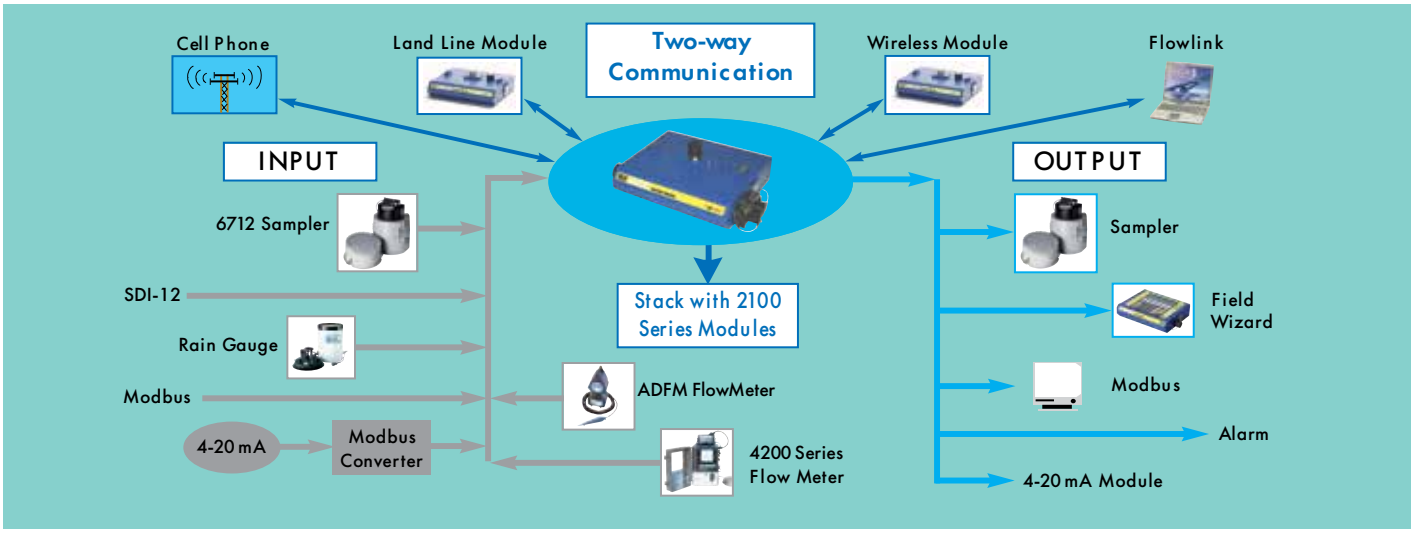
- Make better use of work crews
- Develop more informed budgets
- Verify sewer rehab activities

Flowlink lets you generate informative graphs and tables that can be displayed with a single mouse-click. Any graph can quickly be converted to a table—or vice-versa.

Embed Flowlink graphs and tables into Microsoft Word®, Excel®, and PowerPoint®. Import and incorporate data from other sources, and export to an ASCII spreadsheet file for analysis with programs such as Microsoft Excel.

Flowlink Cipher

Flowlink Cipher represents the latest advancement in Teledyne ISCO's Flowlink series of data management solutions. Now an advanced cloud-based solution, Flowlink Cipher allows site managers to view and manage all data at multiple sites through an easy-to-use and powerful browser-based user interface. Centralized, secure, cloud-based access to device status, site status, and flow data occurs through desktops, laptops and tablet mobiles devices with no need for client software or mobile apps. With AWS hosting security, there is no better protection from service interruptions or data loss. Advanced user administration provides five levels of access with user profiles including View Only, Editor, Analyst, Site Manager, and Administrator.



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SAMPLE CONTAINERS

Plastic containers with Cap

- 1 liter wedge-shaped, 1liter round
- 500 mL wedge-shaped
- 2 liter wedge-shaped
- 1 gallon/3.8- liter round
- 2 gallon/7.5- liter rectangular
- 2.5 gallon/9.5- liter round
- 4 gallon/15- liter round
- 5.5 gallon/20- liter round

Glass containers with Cap

- 350 mL round
- 950 mL round
- 1.8 liter round
- 2.5 gallon/9.5- liter round
- 5 gallon/19- liter round

ProPak® Single-use Disposable Sample Bags

These convenient bags bring a new dimension of productivity to water and wastewater sampling. The patented* ProPak Sample Bag reduces sampling costs by eliminating the expense of washing and storing conventional bottles, while at the same time eliminating worries about contamination from previous samples.

The 1000 mL ProPak bags install quickly inside lightweight, reusable holders. Our 2 gallon (7.5 L) ProPak bags, for composite sampling, fit inside a durable 2.5 gallon (9.5 L) vented bottle. An O-ring holds the bag in place until the screw-on cap is installed.

*Patent #5,996,427

POWER PRODUCTS

Batteries and Solar Charges

Lead-acid Batteries

Our economical lead-acid batteries are maintenance-free, and designed to hold a charge for extended periods.

Nickel/Cadmium Batteries

Your best choice for continuous use applications. Unlike lead-acid batteries, nickel cadmium batteries withstand the abuse of over-charging and can be left totally discharged without being damaged.

High-capacity Power Packs

Convert nominal 120 or 240 Vac to 12 Vdc. A built-in battery charger quickly and efficiently charges the battery while powering your equipment.

Battery-backed Power Packs

Whenever AC power is interrupted, these power packs supply power from a built-in nickel cadmium battery.

Solar Chargers

Ideal for use in remote applications. Teledyne ISCO offers several sizes, and can provide mounting and connecting hardware for most any installation.

Model 948
45-Amp/hour battery (includes carrying case and connect cable)

Model 946
sealed battery (6.5 Amp/hour)

Model 913
(shown) 120 Vac, 50/60 Hz input. Model 923 is identical, except 240Vac

Model 934
(4.0 Amp/hour)

Model 924
Battery-backed Power Pack (shown). 240 Vac, 50/60 Hz input. Model 914 is identical, except 120 Vac

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ACCESSORIES

Flow-through Sample Chamber

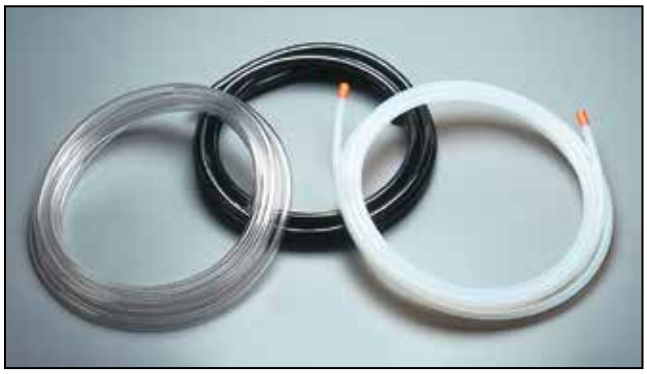
This patented device allows you to do your sampling right in your lab. By installing transfer lines from monitoring points within your plant, you can collect all your samples in a central, sheltered location.

- Use with any sampler and bottle configuration
- High flow rate—up to 150 GPM
- Attachable parameter probe ports

Suction Lines

Three types of suction line materials are available.

- Clear vinyl, 3/8- and 1/4- inch
- Black vinyl, 3/8- inch only
- PTFE-lined polyethylene, 3/8- inch only

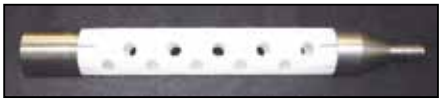


674 Rain Gauge

When connected to a Teledyne ISCO 6712 or Avalanche Sampler, rainfall information can be logged into memory for later retrieval and/or used to trigger sampling. A must-have for storm water monitoring and CSO or I&I studies.

Strainers

Three styles of strainers are available.



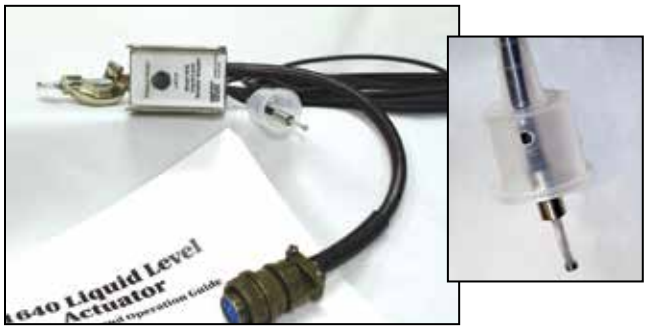
Polypropylene—for general purpose sampling, 3/8- inch ID only.

Non-metallic—for sampling in corrosive flows, 3/8- inch ID only.

Stainless Steel—for low-flow applications, 1/4- and 3/8- inch ID tubing.

1640 Liquid Level Actuator

This device initiates a sampling routine when liquid reaches a predetermined height. Two modes, toggle and latched, allow the sampler to disable when the liquid level drops or continue the routine despite the liquid level.



Street Level Installation Tool

Eliminate the risks associated with manhole entry. Ideal for quick, safe, and economical installation of the sensors used with our 700 modules.

The set includes mounting rings and a multi-section pole, allowing sensor installation in 6-, 8-, 10-, 12-, and 15 inch diameter pipe into manholes up to 15 feet deep. Spring tension holds the mounting ring (with sensor attached) to the pipe wall. For removal, simply pull the strap and the mounting ring collapses.

Picture above shows Suspension Harness and ProHanger.

Suspension Harness

Stainless steel cables attach to the sampler and has a connection ring on top for suspension in manholes.

ProHanger™

Use this sturdy tool to safely suspend a sampler or other instruments inside a manhole. It fits openings from 17- to 24-inch in diameter.

Adjustment is simple and quick. Construction is 100% stainless steel for maximum resistance to harsh environments.

Locking Harness

Secure your sampler to discourage vandalism or theft. Available for portable samplers. Set includes locking cables and padlock.

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PUMPS

HIGH PERFORMANCE
HIGH PRECISION

Pumps for Practically Any Fluid

Founder Dr. Robert Allington and one of his earliest syringe pumps.

Dr. Bob Allington built ISCO's first high performance liquid chromatography (HPLC) pump in 1970 to improve his separation and purification techniques. The DNA from that first Model 314 is still present in the pumps Teledyne ISCO builds today.

From chemicals, to oil/gas, pharmaceutical, and plastics, we continue our tradition of producing quality pumps for ever growing markets.

Dr. Allington required durability and precision in the pumps he built and used in his lab and we've never strayed from that directive.

Since then our D-Series pumps have become the industry standard for the research and development, chemical, and gas and oil industries. Our customers demand the same precision and dependability Dr. Allington required, and Teledyne ISCO delivers.

Our customer satisfaction is unmatched for highly specialized applications and the tradition of innovation allows us to meet any pumping challenge now and in the future.

PHARMACEUTICAL

Whether in the lab, through scale up, or in production where precision dosing is required, Teledyne ISCO pumps are the right choice for continuous flow pharmaceutical applications. In many chemical reactions that occur during research of new drugs, flow rate is key to the success of the experiment, the Teledyne ISCO line of pumps are an accurate and reliable option.

- Product Development—Precise fluid delivery (±0.5% or better) to produce high quality results
- Process Development/Pilot Scale/Production—High repeatability with pulseless flow for trouble-shooting and proof of concept

PLASTICS

Many Teledyne ISCO pumps can pump liquefied gases that are key in the research and development of foam structures. If you are dosing colors or materials into your extrusion process, we have a pump which can perform that. Additionally, the reciprocating line of Teledyne ISCO pumps can provide constant pressure to assist during rotational molding activities.

- Research or Industrial Environments—High Reliability in tough environments
- Ability to Handle Liquified Gases—CO^2, and other gasses can be pumped

PETROCHEMICAL

Teledyne ISCO pumps have a legacy of success throughout the years in the Petrochemical market with many types of applications including, but not limited to, core flooding and reaction feed. The precision flow capabilities coupled with the higher pressure abilities make Teledyne ISCO pumps the choice when designing your experiment or pilot process.

- Continuous Constant Flow or Pressure—Worry free operation for long periods
- Computer Control or Standalone—Varity of external interfaces for computer control or can operate with easy to use keypad input
- Precision Dosing of Fluids—Flow ranges from 0.00001 to 408 mL/min

D-Series
Syringe Pumps

30D Pump

When reliability & accuracy are critical

Teledyne ISCO D-Series precision syringe pumps give you flow and pressure control throughout a broad operating range. D-Series syringe pumps can be metered with great accuracy and do not exhibit pulsation or flow anomalies typically associated with other pump types.

- **Pulseless flow**
- **Broad operating temperature range**
- **Able to handle many corrosive materials**
- **Quality and durability that you expect**

HANDLE A WIDE VARIETY OF FLUIDS INCLUDING:

- Aqueous and organic liquids
- Corrosive solutions
- Heated fluids
- Liquefied gases
- Viscous fluids
- Slurries and pastes

PRESSURES UP TO **30,000** PSI / **2,068** BAR

FLOW RATES FROM **µL/MIN** TO **400 mL/MIN**


Four Pump System


500HV Pumps

PUMPS MADE TO MEET YOUR SPECIAL SITUATION

For a perfect fit, you can customize your high precision pump to handle special flow rates, pressures, port sizes, and software. We can provide hardware and software interfaces to meet your specifications. Customized pump options include pressure transducers and large-bore valve packages (air or electric). The D-Series has many variations available to suit your unique needs:

- Higher viscosity materials (500HV)
- Higher pressure needs that are above the standard pressure range (260HP, 500HP, 65HP)

D-Series
Hazardous Locations

UL approved for Class I, Div 2 environments

100HLf Hazardous Location Syringe Pump

Teledyne ISCO HLf-Series pumps give you the same accurate, predictable flow and pressure control as our standard D-Series, while conforming to safety standards for use in UL Class I, Division 2, Groups A B C & D, T4 environments. The hazardous location rating is achieved through internal design modifications including the use of brushless DC motors. This approach eliminates the need for purge boxes or other additional safety devices.

Wetted materials are compatible with most aqueous and organic liquids, corrosive solutions, heated fluids, liquefied gases, viscous fluids, or slurries and pastes.

The HLf controller has a keypad and LCD, as well as built-in and optional interfaces for computer control and other devices. Programming is easy and flexible, with instant access to menu screens even when the pump is running. This allows you to change operating parameters on the fly.

APPLICATIONS

- Metering and dispensing in experiments and pilot plants where explosive conditions may occur
- Precision fluid addition in research and manufacturing processes
- Chemical/reactant feed in chemical process development, catalyst evaluation, plastic formulation
- Accurate metering of liquefied gases

STANDARD FEATURES

Operating Modes

- Constant flow or pressure with up to four pumps
- Continuous flow or pressure with dual pump
- Flow or pressure programming with single pump
- Dispense mode

External Interface

- RS232/485 serial interface
- Analog voltage inputs
- Digital inputs and outputs
- Ethernet/USB

HLf pumps are not available in Europe

D-Series
Pump Specifications

	Capacity	Flow* Range (mL/min)	Flow** Accuracy	Pressure Range (psi, bar)	Standard Pressure Accuracy	Standard Plumbing Ports	Dimensions	Continuous Flow Range (mL/min)	Higher Viscosity Materials	Higher Pressure	Hazardous Locations
1000D	1015 mL	0.001–408	0.5% of Setpoint	10–2,000 0.7–137.9	0.5% FS	1/4" NPT	40.3x10.7x18.4 in 102x27x47 cm	0.001–265	X		X
500D	507 mL	0.001–204	0.5% of Setpoint	10–3,750 0.7–258.6	0.5% FS	1/8" NPT		0.001–132	X	X	X
260D	266 mL	0.001–107	0.5% of Setpoint	10–7,500 0.7–517.1	0.5% FS	1/8" Valco	39.8x10.7x18.4 in 101x27x47 cm	0.001–70		X	X
100DX	103 mL	0.00001–50	0.3% of Setpoint	10–10,000 0.7–689.5	0.5% FS	1/8" Valco		0.001–32			X
65DM	68 mL	0.00001–30	0.3% of Setpoint	10–10,000 0.7–689.5	0.5% FS	1/8" Valco	40.6x10.7x18.4 in 103x27x47 cm	0.00001–16		X	
65D	68 mL	0.00001–25	0.3% of Setpoint	10–20,000 0.7–1,379	0.1% FS	1/4" F250C	39.8x10.7x18.4 in 101x27x47 cm	0.00001–16		X	
30D	30 mL	0.00001–22	0.5% of Setpoint	30–30,000 0.7–2,068.4	0.2% FS	1/4" F250C	39.4x10.7x18.4 in 100x27x47 cm	0.00001–14			

All D-Series pumps use 100 Vac, 117 Vac, 234 Vac, 50/60 Hz power supply.

External Interfacing: RS-232, analog voltage inputs, digital contact closure for RUN/STOP, REFILL/DELIVER 4–20 mA In/Out, and analog voltage output options available RS485, USB, Ethernet.

Each Teledyne ISCO D-Series syringe pump is bench tested at the factory, prior to delivery. All D-Series pumps are UL certified to EN 61326 and EN 61010-1 standards. They are UL listed and CE compliant.

** Maximum and minimum flows are dependent on optimizing your pump system. Consult a Teledyne ISCO Product Specialist to determine the best method for your application. For additional information, please consult the factory. Teledyne ISCO is continuously improving its products and reserves the right to change specifications without notice. All brand or product names mentioned herein are trademarks or registered trademarks of their respective holders.*

*** Flow rate accuracy are based on select conditions of fluid type, pressure and leakage rate.*

D-Series
Controller

Precision control that you demand

ONE CONTROLLER OPERATION

Up to four pumps can be operated with one "Smart key" controller. The possible configurations, as displayed below, are: single, dual, three, or four pump.

Single pump—constant flow, constant pressure, or dispensing mode

Dual pump—continuous constant flow or pressure or two pump independent modes

Three pump—independent constant flow or pressure or one dual pump mode

Four pump—independent constant flow or pressure with two dual pump systems or four pump independent modes

EASY TO USE

"Smart key" programming makes setting up and running your pump system easy and can be learned in just a few minutes. All D-Series pumps, regardless of configuration or operating mode, utilize the same controller, which can be operated up to 15 meters (50 feet) from the pump modules with optional extension cables. Multiple pumps can be controlled with a single program, a configured program, or independently with varied programs. With complete front panel function and front panel accessability, status, flow rate, and pressure parameters are continuously displayed.

One button access for:

- Start or Stop
- Dispense mode
- Operating parameters such as flow rate, pressure or refill
- Accessory function

User-selectable options for:

- Modes of operation
- Operating units
- Valve selection

Large selection of operating modes:

- Constant flow
- Constant pressure
- Flow or pressure gradients
- Dispensing
- Receiving
- Dual pump concentration gradients

D-Series Controller

COMPUTER CONTROL

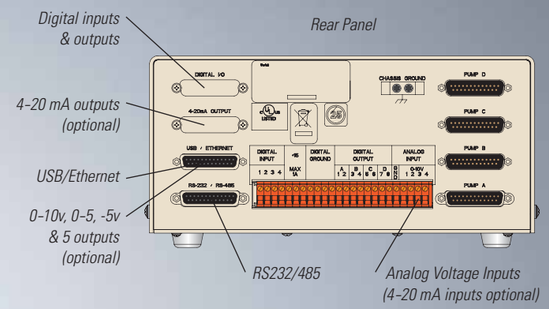
Pump operation by computer control is available to access Start/Stop and set point for pressure or flow.

Standard control interfaces include:

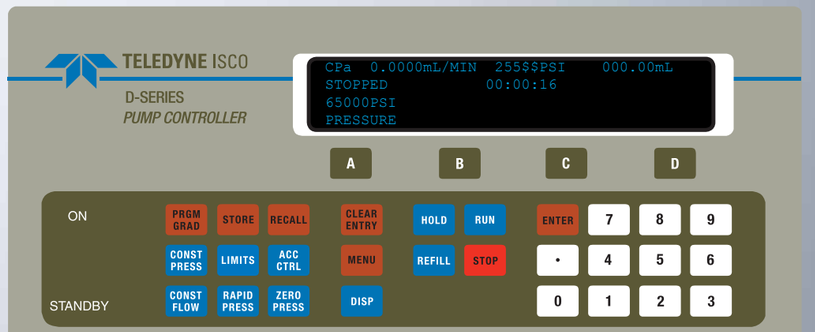
- USB/RS232 Serial
- 0–10Vdc, 0–5Vdc & -5 to +5Vdc Inputs
- RS485/Ethernet—Modbus RTU

Optional interfaces include:

- 0–10Vdc, 0–5Vdc & -5 to +5Vdc Outputs
- 4–20 mA inputs and outputs



KEY CONTROLLER FUNCTIONS



PRGM GRAD Program Gradient: Puts pump in gradient mode and accesses gradient programming.

STORE Store: Stores current gradient program in nonvolatile memory.

RECALL Recall: Replaces current gradient program with one recalled from nonvolatile memory.

CONST PRESS Constant Pressure: Puts pump in constant pressure mode.

LIMITS Limits: Enables changes to maximum and minimum pressure and flow limits.

ACC CTRL Accessory Control: Manually operates accessories such as valves.

CONST FLOW Constant Flow: Puts pump in constant flow rate mode.

ZERO PRESS Zero Pressure: Sets pressure display to zero. Active only from -750 to +750 psi.

RAPID PRESS Rapid Pressure: Allows rapid pressurization to the stable pressure point.

CLEAR ENTRY Clear Entry: Clear the last digit entered from the numeric key.

MENU Menu: Provides access to operational modes, units, and optional parameters.

DISP Dispense Mode: Activates Dispense Mode.

HOLD Hold: Freezes the program clock. The unit will continue at the current gradient.

REFILL Refill: Pump drive motor moves piston downward at a programmed rate.

RUN Run: Turns on pump driver motor to move piston upward.

STOP Stop: Stops the drive motor.

A **B** **C** **D**

A, B, C, D: Soft keys used to select display options

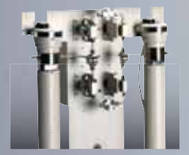
D-Series
Accessories

Do more with these accessories

Air powered valves for continuous flow

AIR-POWERED VALVES

Dual-pump systems, with actively controlled pneumatic valves, work reliably with almost any fluid, including viscous and/or corrosive solutions. Air valves are constant volume; there is no fluid movement when they open and close.



Electric valves for continuous flow

ELECTRIC VALVES

Electric valves are driven by the pump controller and require no outside air source or other power supply. Valves are stem-and-ball type, very reliable, and feature a unique one-way flow path design, which offers added protection against catastrophic back flow. This valve is capable of handling a wide range of corrosive fluids, liquefied gasses, volatile fluids, and viscous solutions.

Wetted package for corrosion resistance

CORROSION RESISTANCE

For applications requiring delivery of highly corrosive fluids, optional wetted materials in Hastelloy or special seals such as virgin Teflon are available. Other options may be available on request.

TEMPERATURE CONTROL JACKET

Controls cylinder temperature by circulating heated or cooled fluid. Cylinder cooling allows fast, complete filling with a liquefied gas and is recommended when a continuous flow system is used for rapid delivery of such fluids. Temperatures range from -30 °C to 100 °C.

HIGH-TEMPERATURE TRANSDUCER

Suitable for operation to 200 °C, this package includes a Honeywell/Sensotec TJE high-temperature transducer, a new cap assembly, and special high-temperature seals.

MIXER

Pump mounted mixer used for moving slurries or viscous fluids along with keeping fluids in suspension.

- Powered by an air driven motor with speeds up to 1700 rpm
- Designed for the 500D and 1000D syringe pumps
- Impeller specifically designed to work with Teledyne ISCO Pumps

PeriXus
Peristaltic Pump

Small footprint, but large capabilities

The PeriXus was developed with your lab or manufacturing plant in mind. With its compact and modular design, this space-saving pump uses peristaltic technology to help reduce the possibility of contamination making it a great pump to use when handling volatile materials. Also, the ability to quickly change hoses allows you to switch from pumping one material to another in minutes, maximizing application flexibility. The available hose options are designed to handle even the toughest materials, including highly viscous fluids. The PeriXus needs minimal maintenance over the life of the pump, which will enhance your return on investment.

SPECIFICATIONS

RPM	0.1 to 300
Flow Rate	0.005–480 mL/min (L/S 16 tubing)
Speed Control (Repeatability)	±0.1%
Reversible Motor	Yes
IP Rating	IP33
Dimensions	9.4" x 5.5" x 6.2" (23.9 x 14.0 x 15.7 cm)
Power	90 to 260, 50/60 Hz
Amps	0.34 at 115 VAC, 0.2 at 230 VAC

KEY MARKETS:

- Pharmaceutical/Biotechnology
- Research and Development
- Petrochemical
- Reaction Chemistry

PERIXUS

ReaXus Series
Reciprocating Pumps

The right pump for the right job

The ReaXus reciprocating pump product line provides many options to meet your application needs. If space is tight, constant pressure is required, continuous flow is a key part of your application, or you just need to move material, any of these pumps will meet your needs. Maintenance is minimal and the quality is high, which over the life of the product, saves you money.

The availability of many options allows you to select the exact pump you need to optimize the results of your application. The ReaXus line of pumps comes in either single piston or dual piston versions along with multiple material choices.

PISTON CONFIGURATION

Single-Piston pumps offer an economical option for metering, dispensing, and general fluid-transfer applications. Single-piston pumps have a 'rapid-refill' feature drawing liquid into the pumping chamber quickly regardless of the metered dispensing rate. This helps minimize flow pulsation. Often, these pumps are configured with a secondary pulse dampener to further smooth fluid flow.

Pump Classes: M1, LS

Dual-Piston pumps have two pistons operating in parallel, fully out-of-phase with each other, to produce naturally-smooth fluid flow. This is critical for many analytical chromatography applications. Dual pistons are also preferred for higher flow pumps (typically above 100 mL/min).

Pump Classes: LD, PR

DRIVE TYPE

ReaXus pumps can be further categorized by the mechanics translating rotation of the pump motor into the reciprocating (back-and-forth) motion of the piston(s).

Direct-Drive mechanisms produce linear piston motion by use of a bearing mounted eccentrically to a rotating motor shaft. This simple arrangement is cost effective, but has limited pressure capabilities.

Pump Classes: M1

Belt-Drive mechanisms produce linear piston motion through a cam mounted on a shaft. A belt-and-pulley configuration connects the pump motor to this cam shaft. The provided mechanical advantage allows for higher pressure capabilities.

Pump Classes: LD, LS, PR

ReaXus LS-Class

ReaXus LD-Class

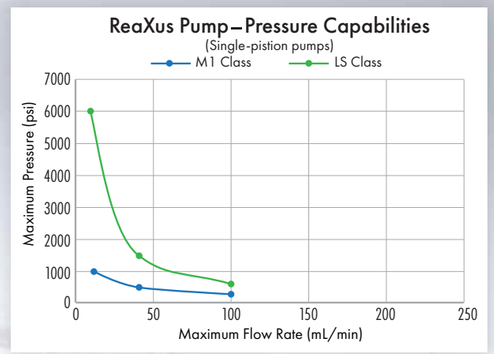
FLOW/PRESSURE CONTROL ALGORITHMS

Reciprocating piston pumps have the ability to produce consistent volumetric fluid flow under very high-pressure conditions. However, they do not produce pressure. System pressure results from flowing liquid through a resistive circuit (column, tubing, reactor vessel, etc.).

The pump's firmware either contains constant-flow or constant-pressure control algorithms. Construction is similar between pumps with flow or pressure control, but component options (e.g. pulse dampeners) are limited when a constant-pressure algorithm is required.

Constant-Flow pumps produce precise and predictable fluid flow dependent on system resistive pressure and the fluid being pumped. Flow accuracy is specified for typical application parameters. Improved accuracy across a larger range of conditions is achieved for pumps with pressure monitoring capabilities by integrated automatic pressure compensation and solvent selection features.

Pump Classes: LD, LS, M1, PR



Constant-Pressure pumps monitor system pressure and use an internal PID feedback loop to modulate fluid low in order to maintain constant pressure. Default PID parameters are suitable for many applications but may be set by the user to optimize pump response for unique system conditions.

Pump Class: LD, LS

WETTED MATERIALS

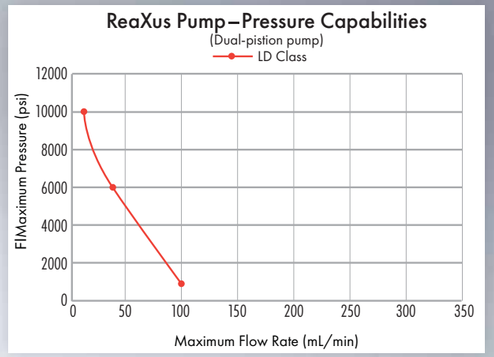
ReaXus pumps are available in a variety of wetted materials. In addition to the primary fluid path material, other wetted materials may include: synthetic ruby, synthetic sapphire, fluoropolymers, and UHMWPE.

Stainless Steel fluid paths are most common with broad acceptance in HPLC, processing, and metering applications. Corrosion resistance, high-pressure capability, and general ruggedness make stainless steel the primary choice of materials.

Hastelloy pumps are used for highly-corrosive applications where stainless steel is not chemically compatible.

Other materials available on request

"Jacketed" pumps are available in stainless steel, or Hastelloy. The pump head is machined with a secondary fluid cavity in close thermal proximity to the main pumping chamber. An external circulating bath can be connected to this secondary cavity to heat or cool the pump head. Heating the head allows for pumping of fluids normally too viscous for operation at room temperature. Cooling the head allows for readily pumping liquid CO_2 in chromatography and extraction applications.



ReaXus Series
Reciprocating Pumps

SINGLE HEAD

M1 CLASS
3 MODELS
Material: Stainless Steel

An economical, compact single piston pump designed to provide great performance at a competitive price. The M1 Series is perfect for transferring material, and day-to-day fluid movement. The flow rate capabilities and pressure limits are typical of the majority of laboratory experiment needs. Overall, the M1 is a great all-purpose pump that will satisfy many of your requirements.

LS CLASS
20 MODELS
Material: Stainless Steel, Hastelloy

A high pressure capable, single piston pump that out performs the more expensive pumps on the market. The LS Series is designed to minimize pulsation during fluid movement, something that many experiments require to be successful. Similar to other models in the product offering, the footprint of the pump is meant to maximize output and without taking up a large amount of space.

DUAL HEAD

LD CLASS
24 MODELS
Material: Stainless Steel, Hastelloy

A dual piston pump perfectly aligned for continuous processing applications. The LD Series offers a high pressure capability and virtually pulse free operation. It is a versatile pump that has multiple fluid path options for your toughest applications.

PR CLASS
2 MODELS
Material: Stainless Steel

A dual headed pump that provides higher flow rates and high pressure capability. The PR Series is well suited for the tougher reaction chemistry applications across many markets. The addition of optional fluid path materials and different seal choices, lays the groundwork for the PR Series to be a very versatile pump.

	FLOW RANGE (ML/MIN)	FLOW ACCURACY	PRESSURE LIMIT (PSI)	STROKE VOLUME (µL)	WITH TEMP JACKET	CONSTANT FLOW / CONSTANT PRESSURE	PRESSURE MONITORING	RS232 CONTROL	REMOTE RUN/STOP	ANALOG INPUT (0-10V; 4-20mA)	DRIP TRAY AND SENSOR	DIMENSIONS AND WEIGHT
M1	0.0–10.0	2%	2,000	25.1	No	Flow	No	Yes	Yes	No	No	5.5"H x 3"W x 10.5"D (14 x 7.6 x 14.7 cm) 3.5 lbs. (1.6 kg)
	0.0–40.0	5%	500	100.5	No	Flow						
	0.0–100.0	5%	250	226.2	No	Flow						
LS	0.0–10.0	2%	6,000	50.3	Yes/No	Flow/ Pressure	Yes	Yes	Yes	Yes	Yes	6.5"H x 7"W x 16"D (16.5 x 17.8 x 40.6 cm) 15.3 lbs. (6.9 kg)
	0.0–40.0	2%	1,600	201.1	Yes/No	Flow/ Pressure						
	0.0–100.0	4%	600	452.5	Yes/No	Flow/ Pressure						
	0.0–10.0	2%	6,000	50.3	Yes/No	Flow/ Pressure						
	0.0–40.0	2%	1,600	201.1	Yes/No	Flow/ Pressure						
LD	0.0–12.0	2%	6,000	30.0	Yes/No	Flow/ Pressure	Yes	Yes	Yes	Yes	Yes	6.3"H x 10"W x 17"D (16 x 25.4 x 43.2 cm) 30.0 lbs. (13.6)
	0.0–36.0	2%	6,000	62.7	Yes/No	Flow/ Pressure						
	0.0–100.0	2%	1,000	251.0	Yes/No	Flow/ Pressure						
PR	0.0–100.0	3%	4,000	251.0	Yes	Flow	Yes	Yes	Yes	Yes	Yes	(16 x 25.4 x 43.2 cm) 30.0 lbs. (13.6 kg)
	0.0–300.0	4%	1,000	564.7	Yes	Flow						

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