

Absolute control. Accurate results.

High Pressure, High Precision
SYRINGE PUMPS

Featuring 30D (30,000 psi) pump



TELEDYNE ISCO
Everywhereyoulook™

30D built on a strong history of syringe pump innovations

Since the initial development of the first high performance syringe pump nearly 40 years ago, Teledyne Isco's syringe pump product line has become the research and development (R&D) leader in the chemical, gas, and oil industry. Teledyne Isco's founder Dr. Allington created the first high performance syringe pump (Model 314) for high performance liquid chromatography (HPLC) applications in 1970. Since then, the syringe pump product line has expanded to cover a wide variety of versatile pumps. Most recently, the model 30D syringe pump was developed with ultra-high pressure capabilities of up to 30,000 psi (2068 bar). It has quickly become the leading pump available for many R&D applications requiring high reliability and performance.

Market Driven Innovations

In the early 1980s, the LC Series syringe pump line was introduced in response to customer needs for increased automation and pressure. This series had three models (LC-500, LC-2600, and ULC-500) featuring automated refill, while covering a wide range of flow rates and pressures up to 10,000 psi (680 bar).

Research in Green Technologies, using Supercritical CO₂ to replace hazardous solvents in laboratories, in the late 1980s brought about the need for pumps capable of delivering liquefied gases reliably and precisely. This resulted in the launch of the third generation syringe pump (D-Series) in 1989, offering the widest dynamic flow range in the industry for supercritical fluids research.

Today, the D-Series line has expanded further with accessories for high temperatures up to 200° C, continuous flow, and the ability to handle corrosive and viscous fluids. The latest innovation, the Model 30D, features patent pending dynamic sealing technology which combines the reliability that Teledyne Isco customers have come to expect and the capability to deliver high pressures up to 30,000 psi (2068 bar).

Customized Products for Application

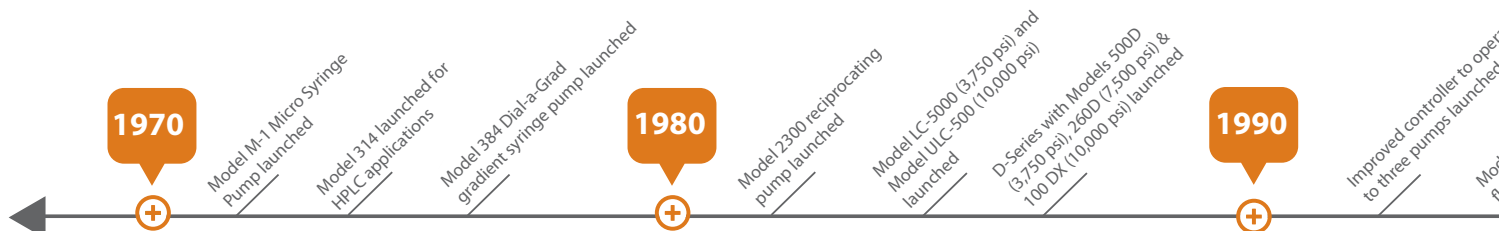
Syringe pump customers, with demanding fluid delivery problems, depend on Teledyne Isco syringe pumps to provide unique solutions for their unique applications. With talented and responsive engineering resources, Teledyne Isco provides custom solutions to meet these needs. Our customer satisfaction is unmatched for highly specialized applications.

Reliable Products from a Dedicated Company

Teledyne Isco has a committed work force with a progressive, integrated ISO 9001 manufacturing operation. The dedicated facility combines research, engineering, sales, service and manufacturing, including plastic molding, machine shop, and assembly operations.

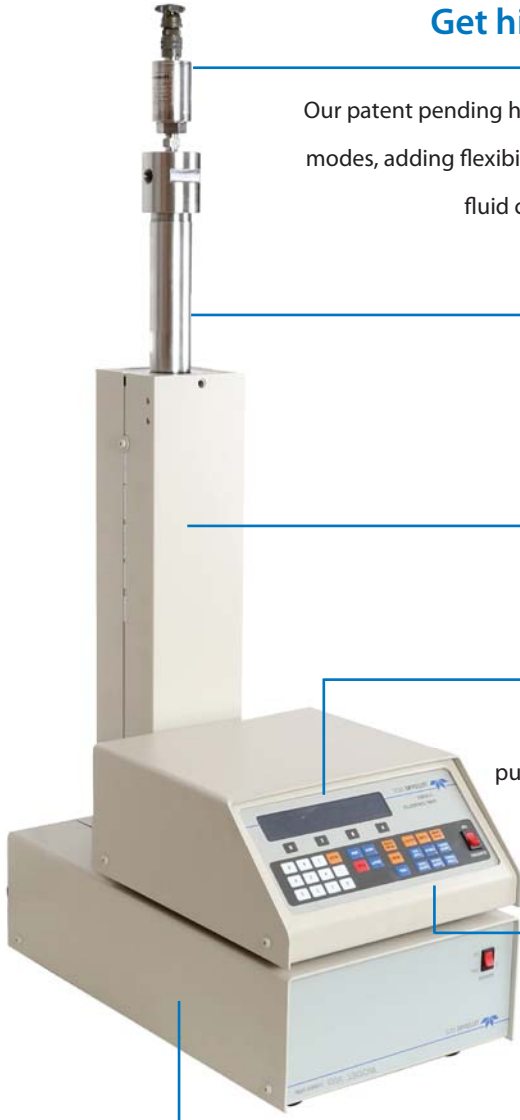
Today, Teledyne Isco has built upon a rich history of pioneering products to create leading edge technologies. It is this ongoing tradition of innovation that allows Teledyne Isco to meet your pumping needs now and well into the future.

Teledyne Isco Syringe Pump Milestones



30D Syringe Pump

30,000 psi
(2,068 bar)



Get high pressure accuracy with our dynamic seal.

Our patent pending high pressure dynamic seals can operate up to 30,000 psi (2068 bar) in all modes, adding flexibility to any application. These unique seals reduce dead volume, making fluid changes easier and with less carry over than other commercial products.

Be safe.

The F-250 fittings are rated up to 60,000 psi (4,137 bar), making them not only applicable for high pressure applications, but also safe.

Count on built to last materials.

Built with nitronic standard materials, your 30D is corrosion resistant.

Be in control.

The "Smart Key" controller allows you to operate the 30D in up to a four pump configuration with multiple operating modes, including continuous flow. You can change settings for constant pressure or flow on the fly.

Communicate.

Control the pump by computer or directly from the front panel. Ethernet and USB communication are now available.

Rely on it.

The 30D's low maintenance gear train ensures its longevity.



Introduced in 2015, the Teledyne Isco 30D syringe pump gives accurate flow and pressure control up to 30,000 psi (2068 bar). While the 30D is an excellent choice for any high pressure application, it is specifically designed for ultra-high pressure core flooding analysis with a patent pending seal design, giving reliable performance for long-term studies at high pressures.

The 30D can meet your current and growing high pressure requirements and accurately duplicate in-situ conditions for deep offshore wells.

The 30D will not exhibit pulsation of flow anomalies associated with other pump types and can handle a wide variety of fluids, including:

- **Aqueous and organic fluids**
- **Corrosive solutions**
- **Liquefied gases**
- **Slurries and pastes**



Reactant Feed

**Petrochemical Industry
R&D to Pilot Plants**



**Core Flooding
Analysis**

Oil and Gas Production



Carbon Sequestration

Carbon Emissions



Alternative Energy

**Research &
Development Biofuels**

**Syringe Pumps
for practically
any fluid.**

The 30D syringe pump can be configured into a continuous system with two pumps or more, along with one controller.



Ultra high pressure

Continuous flow

Reliable

Customizable

Easy maintenance

Higher pressure. Greater possibilities.

Taking traditional syringe pumps to the next level, the 30D high pressure syringe pump allows deep well core analysis. It gives you the ability to reach pressures of 30,000 psi (2,068 bar) and handles exceptional low-flow stability with ease. Ideal for high pressure experiments requiring precision control, the 30D can be used in rock core analysis for hydrocarbon recovery studies in deep well reservoirs, reactant feed in chemical process development and proteomics research using nanobore capillary-packed columns.

Performance meets versatility.

All of the syringe pumps, including the new 30D high pressure pump, bring a host of benefits. Regardless of your experiment, we have the syringe pump to meet your needs. Currently, there are seven pump choices: 30D, 65DM, 100DM, 100Dx, 260D, 500D, and 1000D.

These versatile pumps address a wide range of flow rates from:

- Sub-microliter/min to over 400 ml/min
- Atmospheric pressure to 30,000 psi (2068 bar)

One controller operation

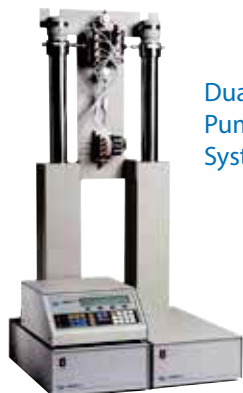
Up to four pumps can be operated with one "Smart key" controller.

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 modes
- **Four pump** – independent constant flow or pressure with two dual pump systems or four pump independent modes



Single
Pump
System



Dual
Pump
System



Three
Pump
System



Four
Pump
System

Smart key. Easy control.

Operating mode

Status

Set point

Front Panel



Volume
remaining

Run time

Pump selected
for parameters



Low maintenance

Our rugged single-ratio drive train is designed for long life, has automatic lubricating gears, and other low maintenance components. The built-in pressure transducer assures excellent stability and repeatability. Teledyne Isco pumps use digital positioning servo control circuitry for low-flow precision at any pressure, plus the high speed smoothness and power of a DC motor. Simple maintenance saves time and money.

Additionally, Nitronic 50, the standard material for cylinders, pistons, and caps, is an austenitic stainless steel with outstanding strength and corrosion resistance. Standard piston seals are heavy-duty, graphite impregnated Teflon, providing long life under harsh operating conditions.

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 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 accessibility; status, flow rate, and pressure parameters are continuously displayed. (See illustration below). Additionally, this adaptable controller simplifies tasks with the following:

One button access for:

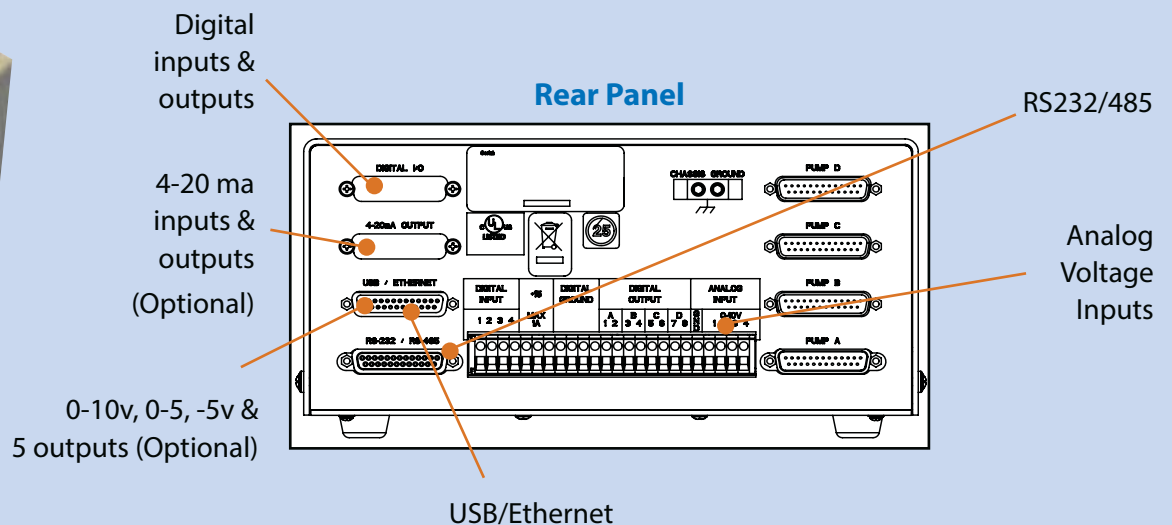
- Start or stop
- Dispense mode
- Operating parameters such as flow rate, pressure or refill
- Accessory function

User-selectable options for:

- Modes of operation
- Operating units
- Valve selection
- External interface control

Large selection of operating modes:

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



Pulseless flow with minimal flow noise

Teledyne Isco syringe pumps are inherently pulseless including dual pump continuous flow systems with low pressure fluctuations during switchovers. Residual flow noise is virtually undetectable, as noted in independent testing. As confirmed in a comparison of flow noise for ultra-sensitive electrochemical HPLC detection, our pumps are 10 to 20 times quieter than other commercially available “pulse-free” micro-volume pumps.

Redundant safety features

All D-Series Pumps have mechanical and electrical fail-safes, in addition to the factory default or user-defined limits. The pump controller monitors motor speed and cylinder pressure, and automatically shuts down if either exceeds the default or user-defined flow and pressure limits. The motor is limited to 6 amperes to prevent an overload condition. Every pump has a drive screw shear key designed to fail if pressure exceeds the pump's maximum rating by 20%.

Ultimate corrosion resistance

Many applications require delivery of highly corrosive fluids. Teledyne Isco offers optional pump packages with cylinder, cap, and piston made from Hastelloy C-276 to provide increased corrosion resistance when pumping acids, salt solutions or other caustic fluids. These packages can be factory-installed or ordered separately so you may upgrade your existing hardware. Check with your Teledyne Isco Product Specialist for the right alloy package for your application.

Superior operating temperature range

Supporting a broad range of temperatures to meet your application needs, pump cylinders can be:

- Heated to 200° C or cooled to -20° C

Our temperature control jackets are especially useful for supercritical fluids or ultra-low flow rates, allowing you to maintain a constant temperature throughout the cylinder. This optimizes the pump's ability to provide an accurate flow rate or pressure set point.





Standard precision pressure transducer

To reduce pressure errors and minimize dead volume, a “button” type transducer is internal to the pump cap. This cap provides the following:

- Compatibility with most solvents, supercritical fluids, brine solutions, and other aggressive fluids
- 0.5% full scale accuracy
- 1° C to 40° C operating range

Options are available for high temperatures, 0.1% linear accuracy, and inert alloys.

Custom pumps and controls

Teledyne Isco provides custom pump designs and controls tailored to your specific application. This may also include application-specific firmware for pump control. If we do not have the combination of pumps and controls you desire, simply contact a Teledyne Isco Product Specialist. They will investigate your inquiry

and send you a quote detailing the configuration, your requested changes, and cost.

Superior manufacturing

Teledyne Isco takes pride in developing and manufacturing quality, innovative products that are built to last, using lean manufacturing to produce CE compliant and shipment-tested products for the oil & gas and chemicals markets. Vertical manufacturing controls every aspect of the product's quality, ensuring every system is 100% function tested before shipment.

Quality customer service

Teledyne Isco employees, sales representatives, and the distribution network put customers first to ensure they have the products and support needed to succeed. As an ISO 9001:2008 certified company, we take pride in developing and manufacturing quality, innovative products that are built to last. Furthermore, global service coverage with certified field technicians and convenient depot repair for remote locations is available.



Expand capabilities with these options.



Air powered valves for continuous flow



Electric Valves for continuous flow



Air or electric valves for single pump operation

Automation

Teledyne Isco's continuous flow systems couple two pump modules to a single controller, and utilize an active or passive valve manifold to provide non-stop, continuous feed of almost any fluid. The controller uses special algorithms to equalize pressure and flow of both pumps during switchover. This allows virtually pulseless transition while maintaining accurate fluid injection to the process. The process is as simple as programming the flow or pressure set point, refill speed, and any parameter limits if necessary, then filling the pumps. Valve packages can accommodate a wide variety of fluids in most applications. With our most advanced 4th generation controller, you can run two continuous flow systems from one controller. You can also control any valve system that requires +15V DC directly from the pump.

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. Valves can be heated up to 200° C with an optional high temperature package.

Electric valves

Electric valves are driven by the pump controller and require no outside air source or other power supply. These 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. Additionally, valves are capable of handling a wide range of corrosive fluids, liquefied gases, volatile fluids, and viscous solutions and can be heated to 150° C.

Single pump valve packages

Single pump valve packages are available in either air or electric valve with the same features as their continuous flow counter parts. Single pump valve packages allow automation for applications not requiring pulseless flow.

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 and 0-5VDC Inputs
- RS485/Ethernet - Modbus RTU

Optional interfaces include:

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



**Analog Input: 4-20 mA
Input Converter**



**Analog Output: 4-20 mA
Output**

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

Regardless of the temperature of your environment, the right transducers are available. These accessories are easily installed and can be added at any time to your Teledyne Isco pump.



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.

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 -20° C to 100° C.



Cylinder Insulating Cover

Reduces ambient temperature effects for best flow stability at low flow rates (below about 0.05% of the maximum flow on any pump model).

Note: Not compatible with dual pump continuous flow systems or the other temperature control jacket.

Choose the syringe pump that's right for you

Tested and Certified

Each Teledyne Isco D-Series syringe pump is bench tested at the factory, prior to delivery.

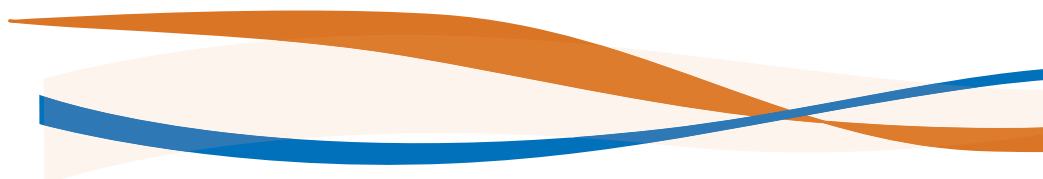
All pumps are UL certified to UL 3101 and EN 61010-1 standards. They are UL listed and CE compliant.



Pump Modules	1000D	500D	260D	100DX	65DM	65D	30D
Capacity	1015 ml	507 ml	266 ml	103 ml	67 ml	67 ml	30.42 ml
Flow Range (ml/min)	0.100-408	0.001-204	0.001-107	0.00001-50	0.00001-25	0.00001-25	0.00001-22
Flow Accuracy	0.5% of Setpoint			0.3% of Setpoint			0.5%
Pressure Range (psi) (bar)	10-2,000 0.7-137.9	10-3,750 0.7-258.6	10-7,500 0.7-517.1	10-10,000 0.7-689.4	10-10,000 0.7-689.4	10-20,000 0.7-1379	30-30,000 2.1-2068.4
Standard Pressure Accuracy	0.5% FS						
Standard Plumbing Ports	1/4" NPT	1/8" NPT	1/8" Valco			1/4" F250C	
Standard Temperature Range	5-40°C Ambient						
Power	100 Vac, 117 Vac, 234 Vac, 50/60 Hz						
Dimensions	Height: 103 cm (40.5 in), Width: 27 cm (10.6 in), Depth: 47 cm (18.5 in)					108 cm (42.5 in)	272x47x99 cm 10.7x18.4x39 in
Continuous Flow Range* (ml/min)	0.1 - 265	0.001 - 132	0.001 - 70	0.00001 - 32	19.5	16	14
Operating Modes	Single pump, continuous flow or pressure Dual pump, continuous flow or pressure Single pump, flow or pressure gradient programming Dual pump, concentration gradient 3-pump continuous flow with modifier Up to 4 pump independent operation 4-pump, dual continuous flow or pressure						
Memory	200 programmable steps						
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						

*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.

Teledyne Isco reserves the right to improve products and change specifications at any time.





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