



# atlas

automated  
synthesis system

# pump

atlas syringe  
pump



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Atlas simply does it all

## What is the Atlas Syringe Pump?

The Atlas Syringe Pump is a versatile volumetric dosing and/or sampling system. It allows 2 independent refilling flows, one continuous flow, reaction sampling, intelligent control of pH and temperature dependant dosing. It consists of two syringes and multi port valves and be controlled from the front panel, by a Reactor Master, an Atlas Base or PC software.

### Atlas Syringe Pump Benefits

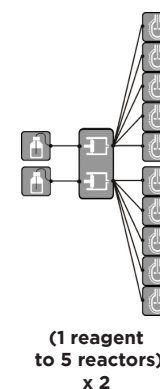
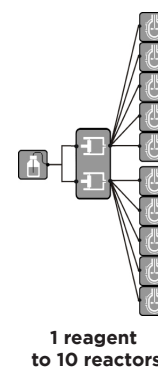
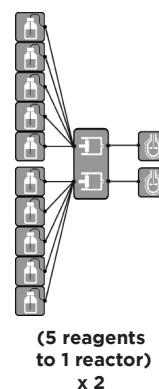
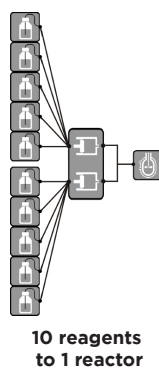
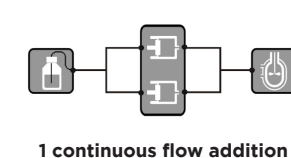
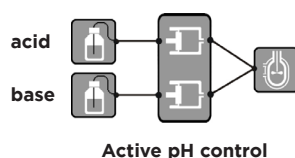
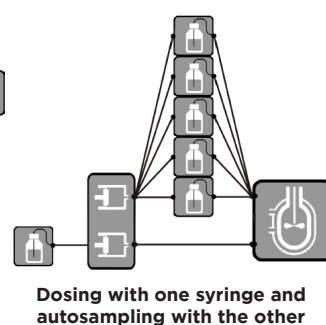
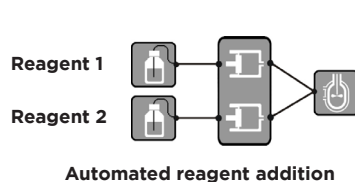
- **Flexible:** Use as 2 refilling pump channels or 1 continuous pump channel or an autosampler
- **Easy to use on its own:** Twist and click control knob and large display
- **Automated reagent addition:** Dispense simply by volume or flow rate over a time period or create advanced flow profiles.
- **Versatile:** 10 reagents to one reactor, 1 reagent to 10 reactors, 5 reagents to 2 reactors, one continuous flow, etc.
- **Automated reaction sampling:** Use with the Autosampler module to regularly aspirate samples into 2ml HPCL vials.
- **Wide flow rate range:** 0.5µl/min to 20ml/min (up to 200ml/min with the Atlas Syringe Pump XL)
- **Intelligent:** Pump to control pH or pause if a reaction temperature is exceeded. Full data logging to a .csv file.
- **Compact Size:** Fits conveniently alongside reactor.
- **Excellent chemical compatibility:** PTFE, PCTFE and glass.

### Watch the Atlas Videos

Watch a video online at [www.syrris.com/videos](http://www.syrris.com/videos) of our Atlas laboratory scale reactors that feature the Atlas Syringe Pump and its easy-to-use "twist and click" knob, and other intuitive features.



### Examples of Operation



**Left:** The Atlas Syringe Pump and Syringe Pump XL

**Above:** The Autosampler module

**Right:** The Atlas Syringe Pump with Atlas Potassium jacketed reactor system.





### Atlas Syringe Pumps

The Atlas Syringe Pumps (regular up to 20ml/min or XL up to 200ml/min) are versatile volumetric dosing and/or sampling systems. They allow 2 independent refilling flows, one continuous flow, reaction sampling, intelligent control of pH and temperature dependant dosing. An Atlas Syringe Pump or Atlas Syringe Pump XL consists of two syringes and multi port valves and is controlled from the front panel, by an Atlas Base, Reactor Master or the Atlas or Reactor Master PC software.

Both types of Atlas Syringe Pumps have 5 main modes of operation (standalone modes shown by \*):

- 1) Dual Dosing\* allows independent control of each syringe (and associated valve), e.g. dose with one syringe and autosample using the other.

Commands include: dose a volume, pump at a flow rate, dose one reagent to many reactors, sophisticated profiles or autosampling (connect the Autosampler and probe to enable automated sampling of up to 6 samples with each syringe/valve)

- 2) pH control\* (with an Atlas pH probe and node plugged in, dose an acid and/or base to keep the pH within a defined range)
- 3) Continuous\* (2 syringe pumps work together to produce 1 continuous flow, i.e. one is refilling while the other is dispensing)
- 4) Atlas Base Control Mode (an Atlas Syringe Pump can be controlled from the Atlas Base Unit or Reactor Master as part of an automated temperature and stirrer speed profile)
- 5) PC Control Mode (PC software can control Dual Dosing, pH Control and Continuous dosing in the same way as the Atlas Syringe Pump in standalone mode)

During dosing commands a maximum temperature can be set to pause the Atlas Syringe Pumps in the case of an exothermic reaction.

The valves are user changeable and are available in a number of different port options. Each of the ports on each valve can be configured to be an input or output, therefore, with a 6 port valve it is possible to pump from up to 5 sources to one reactor, etc. per syringe. The syringes are also user changeable and come in a variety of sizes, corresponding to a variety of flow rate ranges. Use the Atlas Pump Pressurized Input Store to enable an inert gas blanket over the samples to be pumped and to minimize cavitation/bubbles.

### Features common to the Atlas Syringe Pump and Atlas Syringe Pump XL:

- **Chemical Resistance:** All wetted parts made from glass, PTFE and PCFE
- **Maximum Pressure:** 6 bar
- **Number of Syringes:** 2
- **Number of Valves:** 2

**Atlas Syringe Pump****2200072****Atlas Syringe Pump - without Valves or Syringes****2200100**

The Atlas Syringe Pump (2200072) is supplied with two 4 port valves and two 2.5ml syringes by default. The Atlas Syringe Pump without Valves or Syringes (2200100) allows valves and syringes to be purchased separately.

**Atlas Syringe Pump Features:**

- **Options for Syringe Sizes:** 50 $\mu$ l, 100 $\mu$ l, 250 $\mu$ l, 500 $\mu$ l, 1ml, 2.5ml or 5ml
- **Options for Number of Ports per Valve:** 2, 3, 4 or 6
- **Minimum Flow Rate in Continuous Mode:** 20% of syringe volume per minute (e.g. 10 $\mu$ l/min when using 50 $\mu$ l syringes)
- **Minimum Flow Rate in Dual Dosing Mode:** 1% of syringe volume per minute (e.g. 0.5 $\mu$ l/min using a 50 $\mu$ l syringe)
- **Maximum Flow Rate in Continuous Mode:** 400% of syringe volume (e.g. 20ml/min with 5ml). Note that much higher rates are possible with the Atlas Pressurized Input Store.
- **Maximum Flow Rate in Dual Dosing Mode:** 400% of syringe volume (e.g. 20ml/min with 5ml). Note that much higher rates are possible with the Atlas Pressurized Input Store.

**Flow Rate range for the Atlas Syringe Pump (2200072) in  $\mu$ l:**

Syringe Size ( $\mu$ l)	Min Flow Rate $\mu$ l/min		Max Flow Rate $\mu$ l/min	
	Continuous Flow	Dual Dose Mode	Continuous Flow	Dual Dose Mode
50	10	0.5	200	200
100	20	1	400	400
250	50	2.5	1000	1000
500	100	5	2000	2000
1000	200	10	4000	4000
2500	500	25	10000	10000
5000	1000	50	20000	20000

**Atlas Syringe Pump XL****2200376****Atlas Syringe Pump XL - without Valves or Syringes****2200316**

The Atlas Syringe Pump XL (2200376) is supplied with two 4 port valves and two 25ml syringes by default. The Atlas Syringe Pump XL without Valves or Syringes (2200316) allows valves and syringes to be purchased separately.

**Atlas Syringe Pump XL Features:**

- **Options for Syringe Sizes:** 0.5ml, 1ml, 2.5ml, 5ml, 10ml, 25ml or 50ml
- **Options for Number of Ports per Valve:** 2, 3, 4, 6 or 8
- **Minimum Flow Rate in Continuous Mode:** 20% of syringe volume per minute (e.g. 100µl/min when using 0.5ml syringes)
- **Minimum Flow Rate in Dual Dosing Mode:** 1% of syringe volume per minute (e.g. 50µl/min using a 0.5ml syringe)
- **Maximum Flow Rate in Continuous Mode:** 400% of syringe volume (e.g. 200ml/min with 50ml). Note that much higher rates are possible with the Atlas Pressurized Input Store.
- **Maximum Flow Rate in Dual Dosing Mode:** 400% of syringe volume (e.g. 200ml/min with 50ml). Note that much higher rates are possible with the Atlas Pressurized Input Store.

**Flow Rate range for the Atlas Syringe Pump XL (2200376) in ml:**

Syringe Size (ml)	Min Flow Rate ml/min		Max Flow Rate ml/min	
	Continuous Flow	Dual Dose Mode	Continuous Flow	Dual Dose Mode
0.5	0.1	0.005	2	2
1	0.2	0.01	4	4
2.5	0.5	0.025	10	10
5	1	0.05	20	20
10	2	0.1	40	40
25	5	0.25	100	100
50	10	0.5	200	200

Note that some combinations of valves and syringes on the Atlas XL Pump can make up to 3 valve ports inaccessible. Please see the compatibility chart in the valves section (see page 30).

**Autosampler Module (for Atlas Syringe Pumps)****2200196**

The Autosampler Module is designed for use with the Atlas Syringe Pump or Atlas Syringe Pump XL and Autosampler Probe (2200197) to aspirate up to 6 samples (when using 6 port valves) from a reactor at user defined intervals.

The Autosampler Module, which can be mounted on the extra pair of Support Rods provided, holds 6 x 2ml HPLC vials and is located, in a fluidic sense, between the Atlas Syringe Pump and the Autosampler Probe. The Atlas Syringe pumps can sequentially aspirate samples from the reactor into the vials (which can contain a chemical quench if required).

**Autosampler Probe (for Atlas Syringe Pumps)****2200197**

The Autosampler Probe is designed for use with the Atlas Syringe Pump or Atlas Syringe Pump XL and Autosampler Module (2200196) to aspirate up to 6 samples (when using 6 port valves) from a reactor into HPLC vials at user defined intervals.

The Autosampler Probe consists of 6 PTFE pipes held in a chemically resistant (PTFE and glass) sheath, which can be located in a Jacketed Vessel Lid port using the probe holder included. Each of the PTFE pipes is connected to the Autosampler Module during use.

**Autosampler Probe Filter (Cap and 5 Filters)****RD2200463**

The Autosampler Probe Filters fit over the end of the Autosampler Probe (2200197) and minimizes the likelihood of blocking the pipes when aspirating samples. The filters are manufactured from PTFE and have a pore size of 10µm.

**Atlas Pump Pressurized Input Store****2200475**

This module enables reagents pumped by the Atlas Syringe Pump (2200072) or Atlas Syringe Pump XL (2200376) to be conveniently stored in up to 4 x 250ml bottles under an inert gas blanket. The module accepts gas at pressures from 1 to 10 bar and automatically regulates the pressure inside the bottles to 1 bar. This 1 bar pressure avoids a partial vacuum forming when the pump aspirates and therefore allows higher flow rates, the use of more viscous solvents and eliminates bubble formation, resulting in the most accurate pumping possible.

The pressurizable bottles include PTFE filters to prolong the life of the pump valves and syringes and a septum in the cap to enable filling/emptying via a canula.

**PTFE Input filters for 5µm for 3.2mm diameter (pack of 5)****2200594**

A pack of 5 PTFE filters that push on to 3.2mm OD pipe and are ideal for fitting on the input pipes of the Atlas Syringe Pumps. Filtering out particles can increase the life of the syringes and valves. Due to the flow restriction caused, these filters are best used at low flow rates or with the Atlas Pump Pressurized Input Store (2200475).



**2 Port Valve (PTFE/PCTFE) for Atlas Pump** **2200089**

**3 Port Valve (PTFE/PCTFE) for Atlas Pump** **2200090**

**4 Port Valve (PTFE/PCTFE) for Atlas Pump** **2200091**

**6 Port Valve (PTFE/PCTFE) for Atlas Pump** **2200092**

Various valve types depending on number of inputs and outputs required for Atlas Syringe Pump (2200072 and 2200100).



**3 Port Valve (PTFE/PCTFE) for Atlas XL Pump** **2200384**

**4 Port Valve (PTFE/PCTFE) for Atlas XL Pump** **2200385**

**6 Port Valve (PTFE/PCTFE) for Atlas XL Pump** **2200386**

**8 Port Valve (PTFE/PCTFE) for Atlas XL Pump** **2200387**

Various valve types depending on number of inputs and outputs required for Atlas Syringe Pump XL (2200376 and 2200316).

The following table highlights the compatibility between syringes and valves for the Atlas XL pump:

	3-Way	4-Way	6-Way	8-Way
500µl	✓	✓	1*	1*
1ml	✓	✓	1*	1*
2.5ml	✓	✓	1*	1*
5ml	✓	✓	1	1
10ml	✓	✓	1	1
25ml	✓	✓	1	1
50ml	✓	2	1	3

**Key**

✓	No Conflict
n*	Number of port positions partially blocked (can be accessed with compact fitting pipe end fitting and gripper)
n	Number of port positions totally blocked (no suitable fittings)



**Syringe for Atlas Pump - 50µl** **2200093**

**Syringe for Atlas Pump - 100µl** **2200094**

**Syringe for Atlas Pump - 250µl** **2200095**

**Syringe for Atlas Pump - 500µl** **2200096**



Syringe for Atlas Pump - 1ml

2200097

Syringe for Atlas Pump - 2.5ml

2200098

Syringe for Atlas Pump - 5ml

2200099

Various sized syringes for Atlas Syringe Pump (2200072 and 2200100). Syringes are made from glass with PTFE plungers for excellent chemical resistance.



Syringe for Atlas XL Pump - 500µl

2200377

Syringe for Atlas XL Pump - 1.0ml

2200378

Syringe for Atlas XL Pump - 2.5ml

2200379

Syringe for Atlas XL Pump - 5ml

2200380

Syringe for Atlas XL Pump - 10ml

2200381

Syringe for Atlas XL Pump - 25ml

2200382

Syringe for Atlas XL Pump - 50ml

2200383

Various sized syringes for Atlas Syringe Pump XL (2200376 and 2200316). Syringes are made from glass with PTFE plungers for excellent chemical resistance.



Pipe End Fittings for Atlas Syringe Pump - Tefzel 1.6mm

2200198

Pipe End Fittings for Atlas Syringe Pump - Tefzel 3.2mm

2200199

A pack of 10 pairs of flangeless ferrules and ¼-28 fittings for either 1.6mm or 3.2mm pipe.



PTFE Pipe 1.6mm OD x 0.5mm ID x 10mm

2200301

PTFE Pipe 1.6mm OD x 0.8mm ID x 10mm

2200302

PTFE Pipe 3.2mm OD x 1.5mm ID x 10mm

2200303



**The Atlas Syringe Pumps are designed and manufactured by Syrris, the world's most advanced provider of laboratory scale chemistry systems.**

**Syrris' network of offices in the UK, USA, Japan, India and Brazil plus over 35 distributors worldwide offer local service and support.**



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