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INFORMATION SHEET

Part name	Part number
Mitos Syringe Pump	3200001
Mitos Syringe Pump XS	3200002

Description

The Mitos Syringe Pump is a versatile microfluidic pumping solution. It can be configured into 2 refilling flows or 1 continuous flow. It is operated using an intuitive twist and click knob and display or by PC software (3600001). A choice of flow modes allows simple complex flow control.



Left: Mitos Syringe Pump XS (3200002).

Above: User replaceable syringes allow wide flow rate range. Part numbers are given below.

Benefits

- Versatile
- Excellent flow rate
- Wide pressure range
- Excellent chemical compatibility
- Intelligent

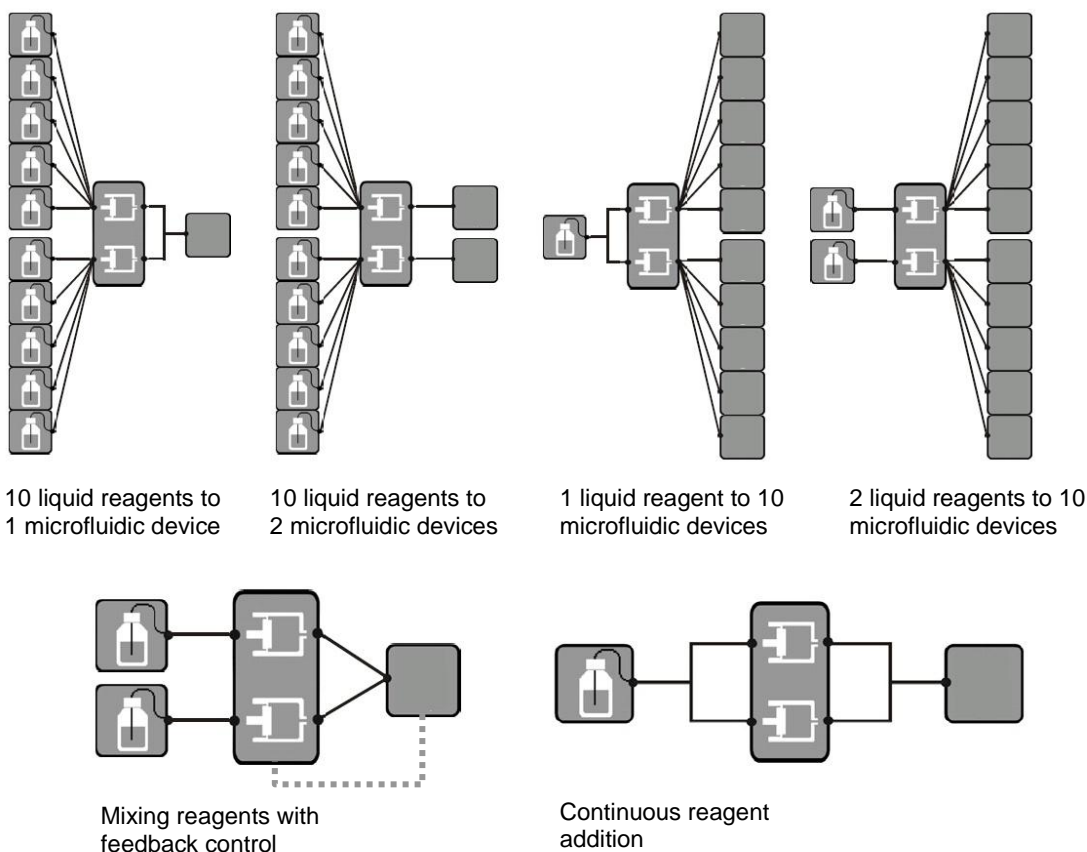
	Pump Specification	Value
1	Number of channels	2 refilling or 1 continuous
2	Number of input streams	1 - 10
3	Number of output streams	1 - 10
4	Flow rate range	0.5 μ l/min - 10 ml/min (0.1 μ l/min - 10 ml/min for xs pump)
5	Operating pressure range	0 - 6 Bar (0 - 90 PSI)
6	Size (height x width x depth)	260 mm x 160 mm x 250mm
7	Wetted materials	Glass, PTFE and PCTFE

User interface and control

The Mitos Syringe Pump can be used on its own with the twist and click control knob and large display. Automated liquid reagent addition may be carried out by setting dispense volume or flow rate over a time period. It is also possible to generate advanced flow rate profiles.

Modes of operation

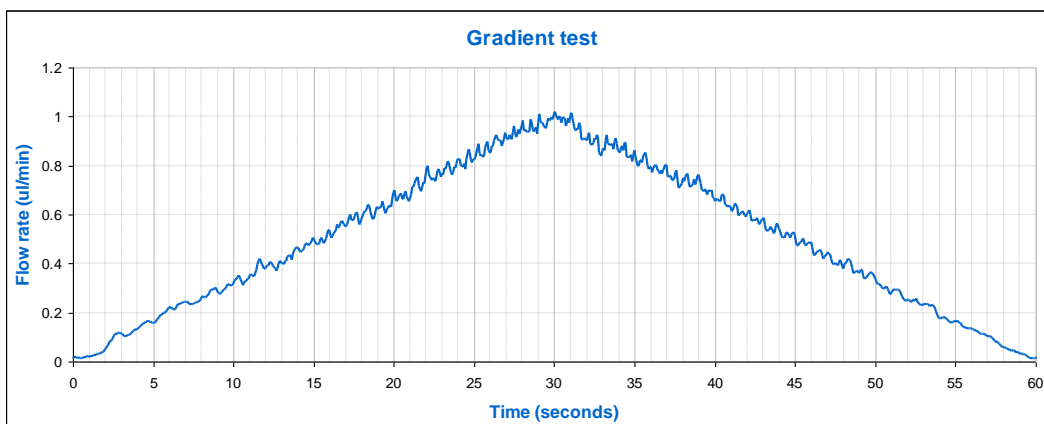
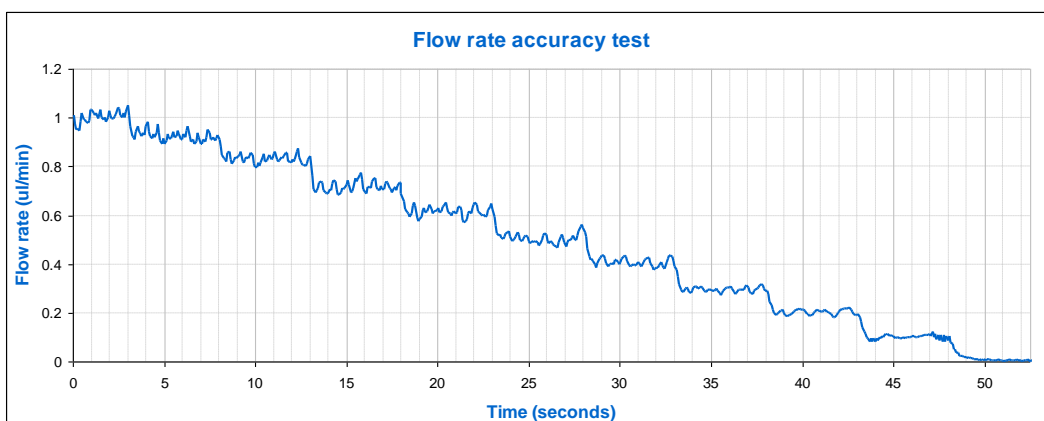
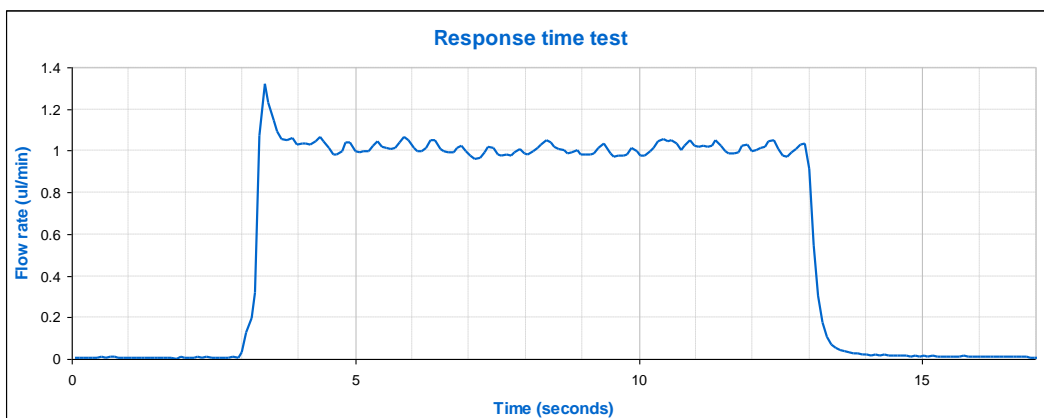
The pump has two syringes and two multi-port valves allowing it to be configured in a number of ways. As each port can be used to aspirate from or dispense to, the pump can be used as “one to many”, “many to one” or one continuous flow. The various configuration options using a 6-port valve are shown below:



Extra smooth pump option

The Mitos Syringe Pump uses a stepper motor drive for the two syringe axes. This is suitable for the majority of pumping applications. However, in some microfluidic applications the pulsation from the stepper motor can affect performance. This is typically where the flow rate is less than $10\mu\text{l}/\text{min}$ and the system volume is less than $100\mu\text{l}$. In these cases the Mitos Syringe Pump XS (extra smooth) will eliminate most pulsation issues. This is achieved with advanced drive electronics that remove the pulsation from the stepper motor, providing pulse-free flow.

The graphs below show the flow performance that can be obtained using the XS pump with a $12.5\mu\text{l}$ glass syringe.



Notes: The graphs show flow rate (raw data) measured using a thermal anemometer sensor. Prior to the tests some optimisation was carried out to match the response of the pump to the fluidic system.

The part number for the MitoS Syringe Pump XS is **3200002**

Application examples

1. Real time control of flow rate with an in-line sensor. In this application the analogue voltage output of a downstream sensor was fed back to the pump. The pump controlled the flow rate to meet the target level for the sensor. PID control is possible in this type of application.
2. Surface modification of microfluidic devices. In this application a pump channel was connected to a microfluidic device and series of reagents were pumped through the device. The flow rates and residence times were adjusted to optimise the surface modification procedure.

Contents

The pump will be supplied with the following items:

- User manual
- Power Cable
- USB 2.0 Cable – USB A to USB B
- Decontamination Certificate
- Flow tubing starter pack (3000260)
- 2 x Valves, 4 Port, PTFE/PCTFE (3000246)
- 2 x Syringes, 100µl, Glass/PTFE (3000249)

Mitos Syringe Pump Software (3600001) that allows the pump to be controlled from a PC can also be purchased.

Parts and Accessories

Various valves are available depending on the number of inputs and outputs required. Similarly, Dolomite offers a wide range of syringe sizes for different flow rates.



Far right: A four port valve.

Right: Two user replaceable syringes.

Description	Specification	Part Number
2 Port Valve (PTFE/PCTFE)	Max. Pressure = 6bar	3000244
3 Port Valve (PTFE/PCTFE)	Max. Pressure = 6bar	3000245
4 Port Valve (PTFE/PCTFE)	Max. Pressure = 6bar	3000246
6 Port Valve (PTFE/PCTFE)	Max. Pressure = 6bar	3000247
Syringe for Mitos Syringe Pump - 50µl	Typical flow rates: 0.5ul/min to 100ul/min	3000248
Syringe for Mitos Syringe Pump - 100µl	Typical flow rates: 1ul/min to 200ul/min	3000249
Syringe for Mitos Syringe Pump - 250µl	Typical flow rates: 2.5ul/min to 500ul/min	3000250
Syringe for Mitos Syringe Pump - 500µl	Typical flow rates: 5ul/min to 1ml/min	3000251
Syringe for Mitos Syringe Pump - 1ml	Typical flow rates: 10ul/min to 2ml/min	3000252
Syringe for Mitos Syringe Pump - 2.5ml	Typical flow rates: 25ul/min to 5ml/min	3000253
Syringe for Mitos Syringe Pump - 5ml	Typical flow rates: 50ul/min to 10ml/min	3000254

Note that the pump is not limited to the typical flow rates. At the lower end of the flow rate range flow stability is reduced and the use of a smaller syringe size is recommended.