Mitos Fluika Control Valve

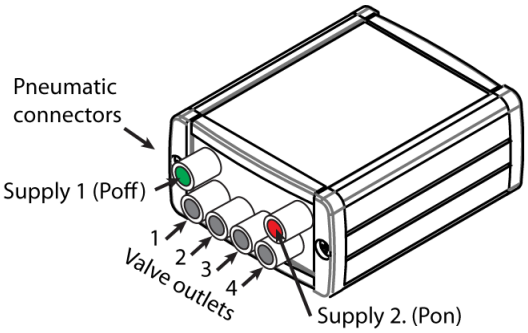
dolomite

Part name	Part number
Mitos Fluika Control Valve	3200420

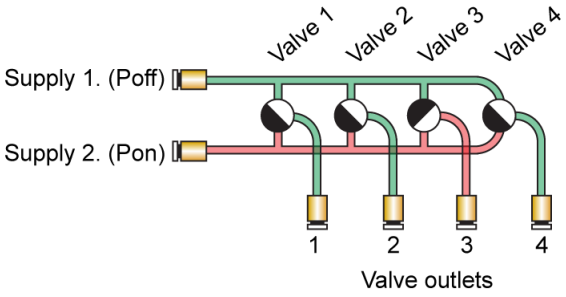
Description

The Mitos Fluika Control Valve contains four distributor valves in order to allow quick switching between two different pressure sources. The device is easy to use and ultra-portable which makes it perfect for OEM integration.

Power and control for the control valve is via a USB connection to your PC. You can integrate the control valve into your own software application using the ***Mitos Fluika control valve software user instructions*** or to get you started it can be used directly "out of the box" by installing the PC application supplied and also available upon request from support@dolomite-microfluidics.com.



Outside view

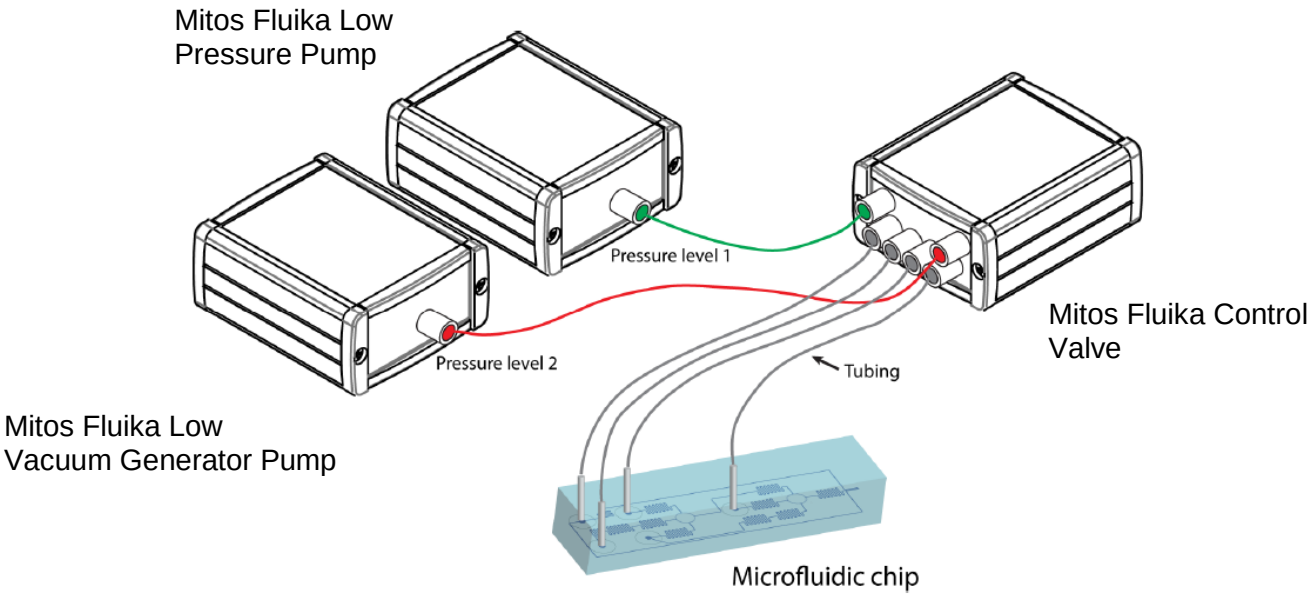


Schematics

The Mitos Fluika Control Valve has four pneumatic outlets and two pneumatic inlets which are accessed via 4mm tube push-fit pneumatic connectors on the front panel of the device.
If a given valve is switched off, the respective outlet is connected to supply 1 (Poff).
If the valve is switched on, then the outlet is connected to supply 2 (Pon).
If your application requires control of less than four outlets, it is advisable to seal the remaining outlets with blanking plugs.

Main Benefits and Applications

The Mitos Fluika Control Valve is a good choice for applications where fast switching between two pressure or vacuum levels is required. A typical example could be microfluidic flow control, this is illustrated below:



The two pressure levels could be provided by the Mitos Fluika Low Pressure Pump (Part No. 3200418) and the Mitos Fluika Low Vacuum Generator Pump (Part No. 3200419), which are also easy to connect up to your system using the same 4mm OD tubing. If one of your chosen pressure levels is atmospheric, then the corresponding supply inlet of the Mitos Fluika Control Valve can be left open.

Performance

Performance of the valve controller is described by:

- Switching speed
- Gas flow properties
- Timing accuracy

Switching speed is the time taken between receiving the electrical signal to physical actuation of the valve. Switching speed does not depend on the pneumatic circuitry and the volume of the reservoir connected to the valve.

Gas flow properties describe the pneumatic resistance to the gas flow. Because of finite flow rate, the speed of pressure switching is dependent on the size of the reservoir, where pressure is switched. Pressure stabilization through the valve is described by:

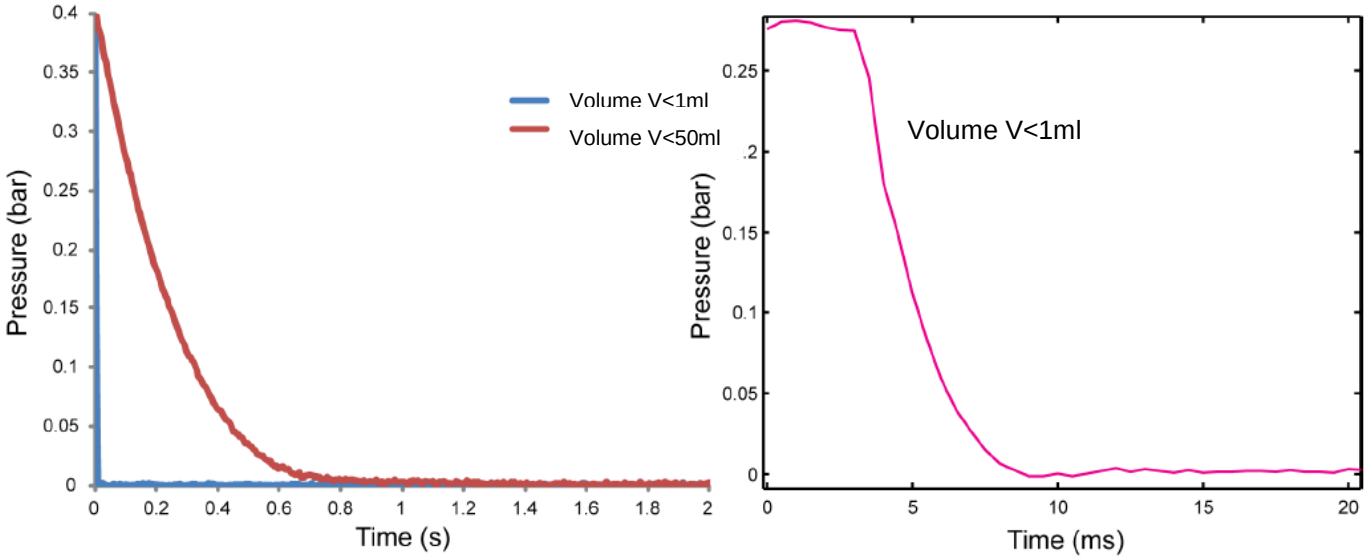
$$\Delta p \approx \Delta p_0 e^{-\frac{R_{rel}\, t}{V}}$$

Where R_{rel} release rate (ml/s) and V is volume of the reservoir. The characteristic time scale would be:

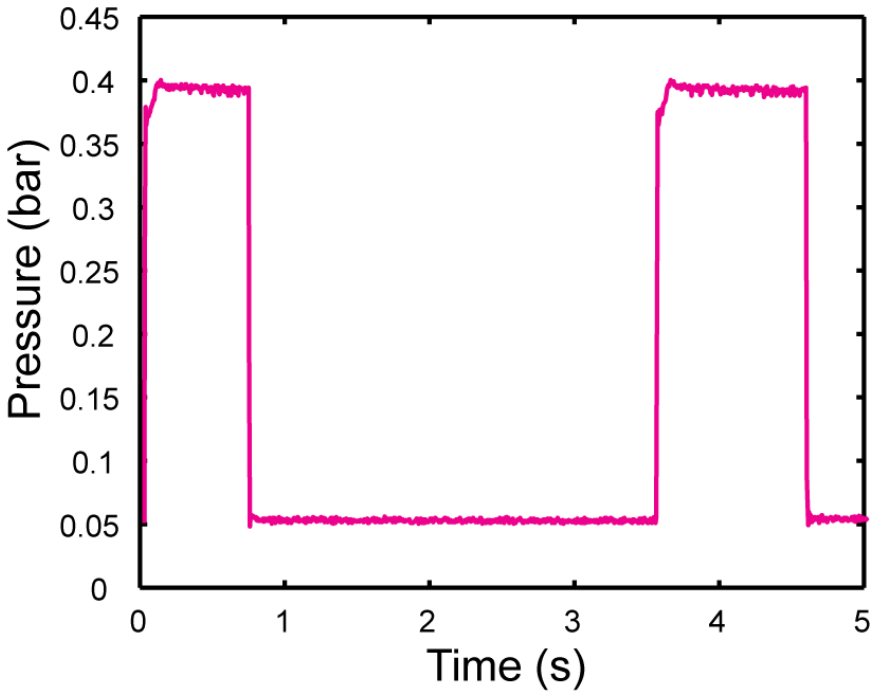
$$\tau = \frac{V}{R_{rel}}.$$

Timing accuracy is a function of the control electronics, which defines the accuracy of the switching signals.

Typical performance is shown in the following figures:

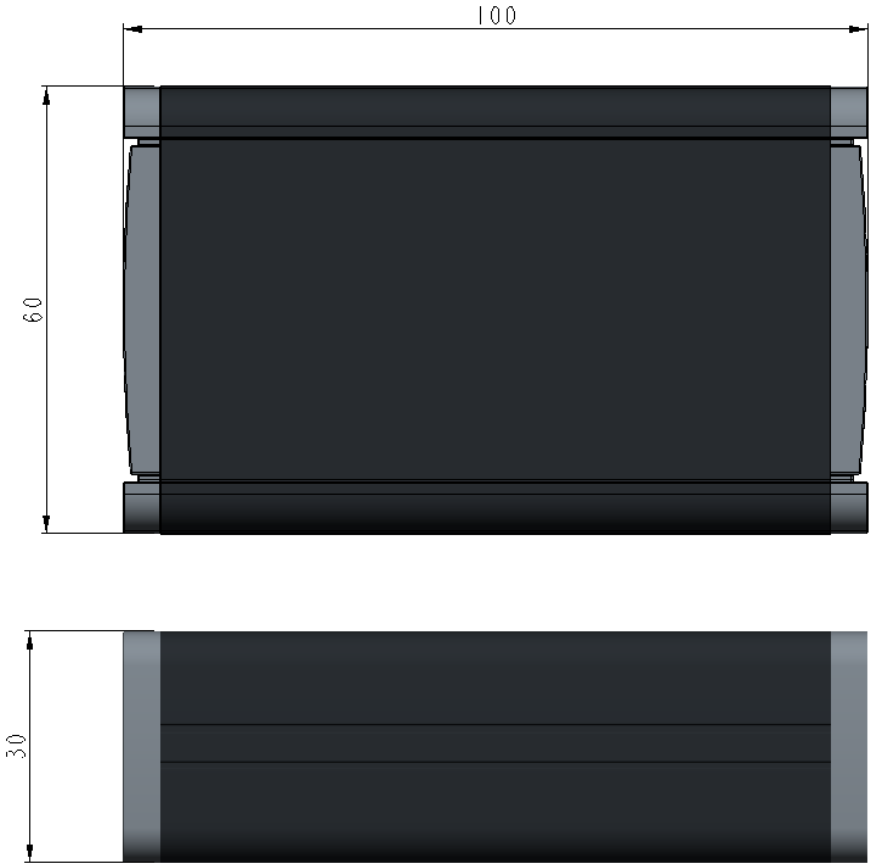


The left graph shows pressure relaxation through the valve depending on the volume of the reservoir V (<1ml or 50ml). The right graph shows a closer look at small volume (V<1ml) response, it can be seen that the switching speed is <5ms. Total response time, in the case of small a volume reservoir could be <10ms. An example of switching between two pressure levels (0.05 and 0.39) is shown in the following figure:



Dimensions

Length: 100mm
Width: 60mm
Height: 30mm



Product Specification

Characteristic	Typical	Minimum	Maximum	Unit
Electronic time resolution	**1**	**n/a**	**n/a**	**ms**
Valve response time	**5**	**n/a**	**10**	**ms**
Pressure change rate depending on the volume of reservoir (^{R}rel)	**300**	**200**	**n/a**	**ml/s**

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