

Fluid Metering Inc. - Dispensing Experts Since 1959.
Over 150,000 FMI Dispensers and Pumps used in Diagnostic, Medical and Analytical Instruments.

Comparison between FMI Valveless dispenser technology and Syringe Pump Technology used in CONTINUOUS Dispensing Applications. Typical application - Dispensing, aspirating and Diluting 2-5000 microliters. Wash cycle of 100-5000 microliters.

Key FMI Features- Accuracy - better than 1% , No Valves, Fewer Components , Faster Through-Put, Cost Less.

Feature / Function	FMI Ceramic Dispensers	Syringe Pump Technology (typical)
Valves	No valves to leak, clog, hang-up or service.	2 - 4 solenoid or motorized valves. Valves will eventually leak, clog or hang-up.
Fluid Path	Simple 2 port configuration.	Syringes and valves require 3-5 times as many fluid connections. Additional ports, fittings and tubing considerably increase the possibilities of leaks .
Moving Parts (excluding motors)	One - only the ceramic piston.	2-4 solenoid or motorized valves + 2 syringes. More moving parts slow down the cycle rate.
Moving Parts (motors)	One	2 syringe motors and in some designs 2-4 valve motors. Higher power consumption.
Dilute Wash or Clean In Place Cycles	Same FMI dispenser is used for fast dilution, washing and continuous pumping. Through-put is very fast & does not effect long term performance.	Slow process effecting through-put. Higher flow rates contribute to accelerated maintenance frequency. Extra wash pump and 2 additional valves are sometimes used in order to conserve the life of the syringes.
Vacuum	FMI dispenser / pump can also be used as a vacuum pump for continuous vacuum cycles.	Syringes can not be used for continuous vacuum cycles and in many applications a separate vacuum pump and additional valves are used.
Reliability & Long Term Cost	Millions of trouble free cycles. Example- 84 million dispenses of 50 microliters with better than 0.5% accuracy.	Requires service and calibration after 10-50,000 cycles. Some companies forgo servicing the syringe barrel and seals by replacing the complete unit.
Total System Components & Power Consumption	One pump one driver board low Power Consumption	2 syringes, 2 syringe motors, 2-4 valves, 2-4 valve motors or solenoids , 2 driver boards, more fittings, electrical wires and connectors. More components, more things to go wrong, leak and service.
Cost	Very competitive.	Comparable system can cost twice the price of an FMI pump. More items to purchase and keep in inventory.
Size	Very small - (5" x 3" x 2", or 117 x 79 x 53 mm)	Considerable more space required to mount the components. Typically 3-4 times more space is required.
Assembly & Labor	Simple one unit to mount and only 2 fluid ports to connect.	Considerably more components to assemble and mount. 3-5 times more fluid connections and electrical wiring.
Through-put	Very fast. High accuracy, low volume dispensing together with dilution and wash cycles are all done in one unit.	Slow. If one syringe pump is used - long wait for refill cycle. When 2 syringes pumps are used - valve switching is time consuming. This is particularly evident when larger volume dilutions, clean in place and wash cycles are used.