

Introducing the Parker Smart Syringe Pump

Simplified Instrument Design

Direct mounting at the point of dispense improves performance by eliminating the need for a transfer line

CE compliant for emissions, immunity, and safety

Longer Life

Designed to 5 million cycles

Superior Performance

Best in class resolution, 228,500 steps full scale, enabling smaller sample and reagent volumes

Non pulsatile flow down to 7.5 nL/sec

Smaller Footprint

1/3 the size and the weight of standard 30mm Syringe pumps

To learn how Parker is making a difference, visit
www.parker.com/ppf/smartsyringepump

Smart Syringe Pump

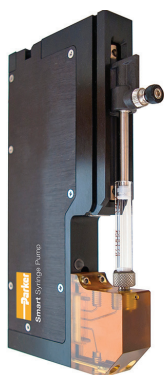
Precision Fluidics



ENGINEERING YOUR SUCCESS.

Smart Syringe Pump

Precision Aspirate and Dispense Syringe Pump



Markets:


- Clinical Diagnostics
- Analytical Chemistry

Typical Applications

- Sampling
- Reagent Addition
- Liquid Handling
- Precision Flow Control

At one third the size and weight of standard 30mm syringe pumps, the Parker Smart Syringe Pump improves the performance of Clinical Diagnostic and Analytical Chemistry systems by improved resolution and bringing the pump to the point of dispense. This long life pump is designed to a minimum of 5 million cycles, improving system reliability and reducing downtime. Its lightweight and compact size enables smaller instrument designs, decreasing instrument costs and footprint.

Features

- Designed to a minimum of five million cycle life
- Encoded servo motor with 228,495 step resolution improves low volume and low flow performance
- Non pulsatile flow down to 7.5 nL/sec
- Can be mounted directly on motion systems placing it directly at the point of aspirate and dispense
- Eliminates transfer lines; simplifies fluidic designs, reduces footprint and instrument cost
- Easy drop in replacement for existing syringe pumps
- CE and RoHS Compliant 

Product Specifications

Performance

Drive Type:
Lead nut screw with guide rail, Servo motor with high resolution encoder
Precision:
≤0.1% CV full stroke
≤0.5% CV 10% of full stroke at point of dispense (measured fluidically)
Accuracy:
± 1.0 % full stroke
± 2.0 % at 10% full stroke at point of dispense (measured fluidically)
Resolution:
228,495 steps full scale
0.22nL per step (50 µL syringe)
Minimum Flow Rate:
7.5 nL/sec (50 µL syringe), non pulsatile flow
Stroke Speed:
1 sec to 111 minutes full stroke
Valve Switching Speed:
<50 msec open/close
Pressure:
29PSIG (2.0 bar)
Syringe Barrel Volumes Supported:
50 µL to 1mL, Standard 30 mm XP type syringe barrels

Physical Properties

Operating Environment:
15° to 40° C, 20% to 90% Relative Humidity (non-condensing)
Storage Environment:
-20° to 70° C , 20% to 90% Relative Humidity (non-condensing)
Drive Dimensions:
0.69" (17.5 mm) x 4.1" (104 mm) x 6.35" (162 mm)
Weight:
0.81 lbs (367g)
Valve:
3 way diaphragm isolated solenoid valve
Pump Assembly Rated Life:
5 Million Cycles
Fittings:
¼-28 flat bottom female fittings for fluid connections and syringe
Recommended Filtration:
100 mesh or 150 µm
Wetted Materials
Manifold:
Polyetherimide (ULTEM® 1000)
Valve Diaphragm and Gasket:
FFKM (KALREZ®)

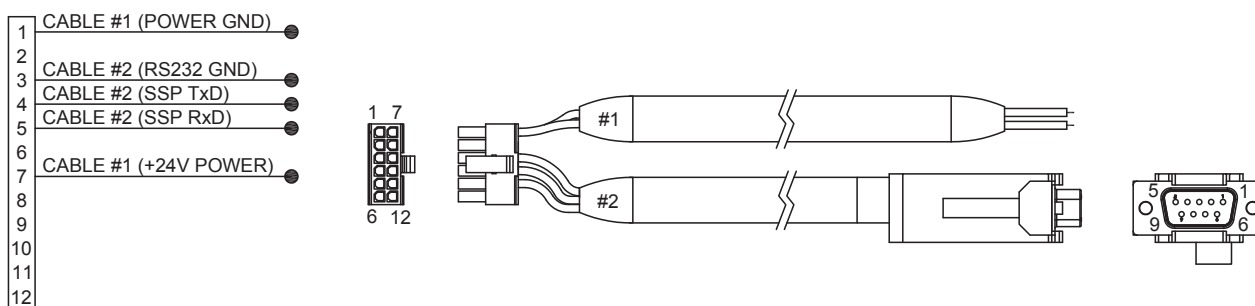
Electrical

Electrical/Communications Termination:
12 Pin Molex® Micro-Fit Connector
Power:
24 VDC ± 5%, <1 Amp
Command Set:
Cavro® scripting language
Smart Syringe Pump command library
Communications:
Interface: CAN, RS-232
Baud Rate: RS232: 9,600, 14,400, 19,200, 38,400, 57,600 and 115,200
CAN: 20K, 50K, 125K, 250K, 500K, 800K and 1M bits per second
Addressing:
Up to 127 pumps can be daisy chained and addressed individually
RS 232 Format:
Data Bits: 8, Parity: None, Stop Bits: 1, Half Duplex

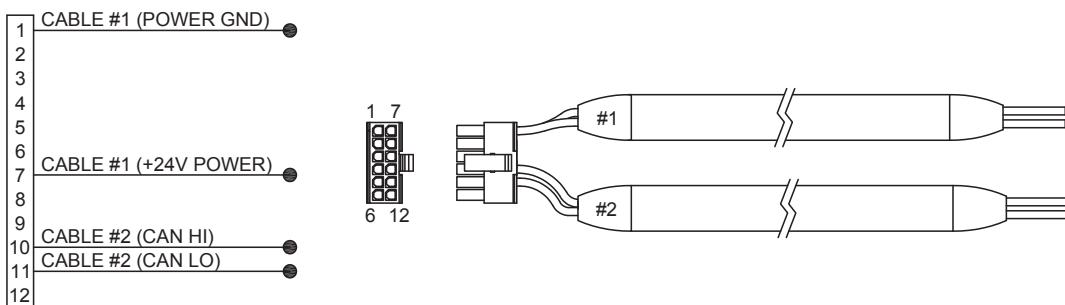


Electrical Interface

RS232 Wiring Diagram



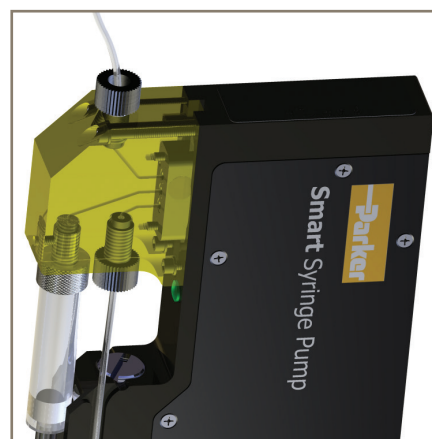
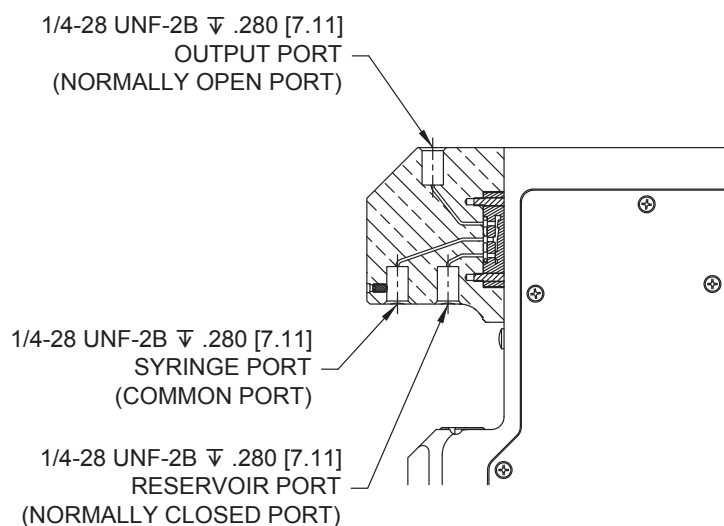
CAN Wiring Diagram



Molex® Connector, Female 12 position Micro – Fit 3.1, Molex® # 43025-1200

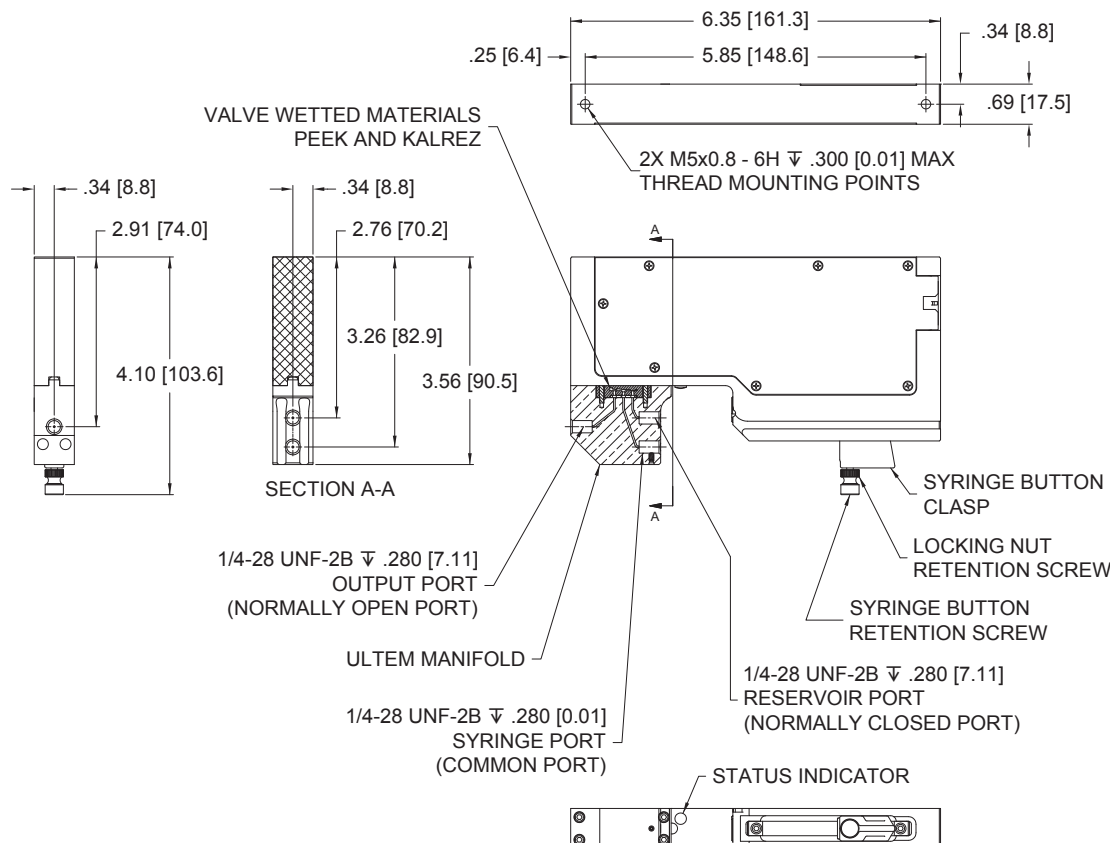
Molex® Terminal crimp socket, 20-24 AWG, Molex® # 43030-0007

Fluidic Interface

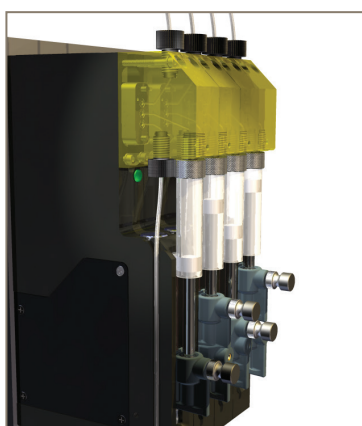
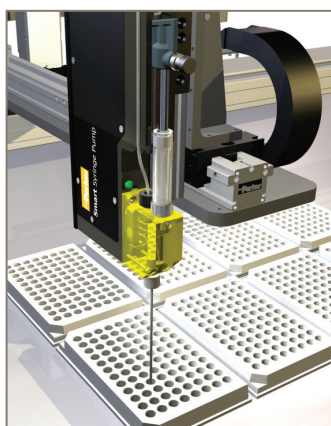
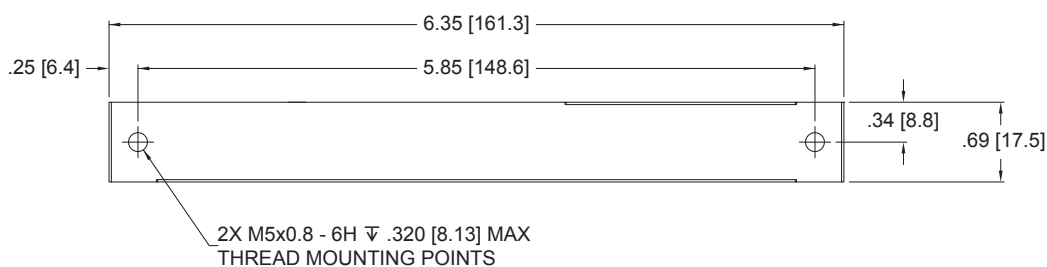


Leak diversion features built in to prevent damage to the pump in the event of leakage

Wetted Materials and Dimensions

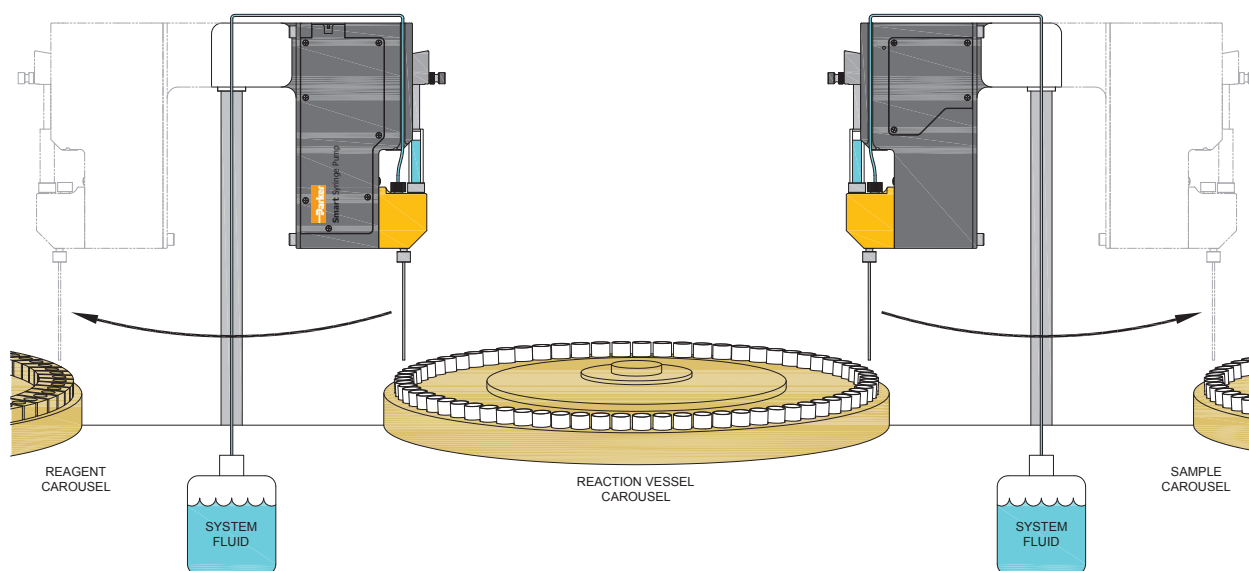


Mounting Dimensions



Typical Flow Diagram

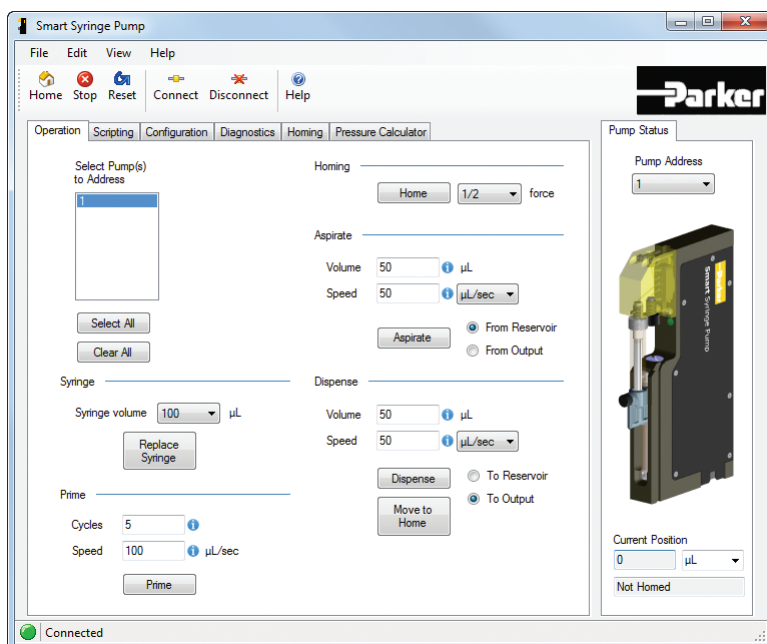
IVD Sampling & Reagent Addition System



Aspirate and Dispense control of sample and reagent fluids:

- Smart Syringe Pumps mounted directly to motion systems eliminating need for transfer lines between pumps and probes.
- Easily programmed to aspirate and dispense variable amounts and dispense multiple aliquots
- Three way valve allows the use of a system fluid to isolate the pump from samples and reagents
- System fluid can be used to clean inside of probe after dispense

Software



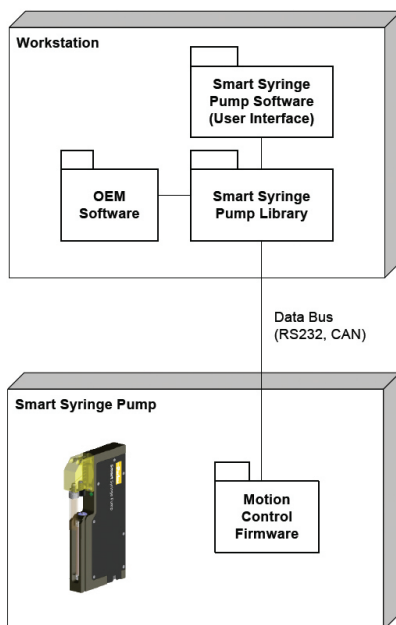
- Easy to use Smart Syringe Pump Windows® based software simplifies control and testing of the Smart Syringe Pump
- Easy to test, with the Parker Smart Syringe Pump evaluation kit you can be testing in fifteen minutes. Pump, cables, tubing and software all included
- User-friendly graphical user interface for pump evaluation or optimization.
- Simple point and click interface allows access to all Smart Syringe Pump capabilities
- Simplifies bench level testing
- Scripting interface makes developing scripts easy

SmartSyringePump

Precision Aspirate and Dispense Syringe Pump

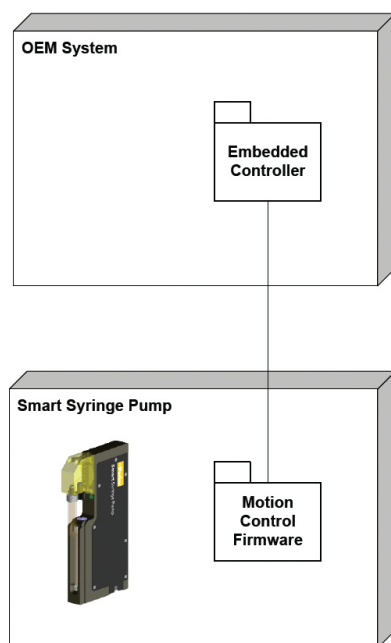
Smart Syringe Pump Software Libraries and Control

Options for integration into OEM instrumentation



Smart Syringe Pump Using Workstation Control

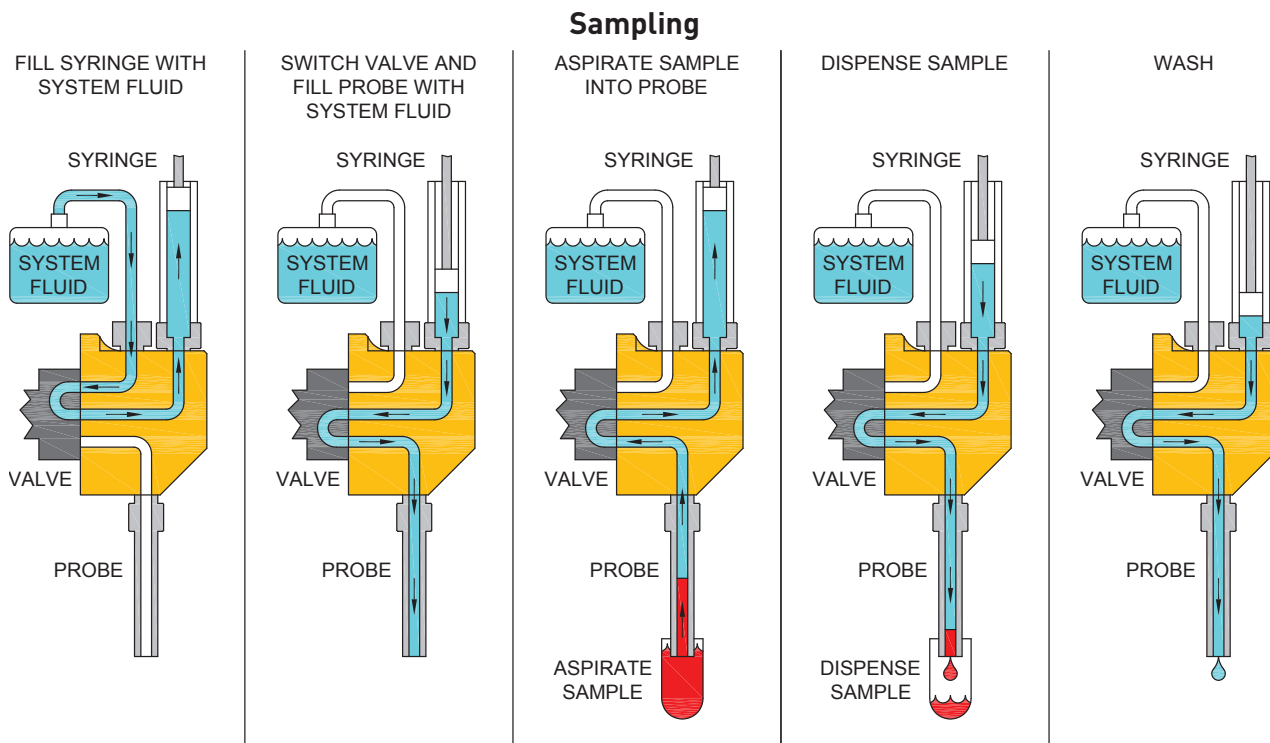
- Supports Cavo[®] scripting commands
- Enhanced Smart Syringe Pump scripting commands available
- Allows for calibrated syringe volumes to be used
- Enables commands to be sent in fluid volumes rather than motor steps
- Smart Syringe Pump and Cavo[®] commands can be used in combination
- Full control and configuration through library commands



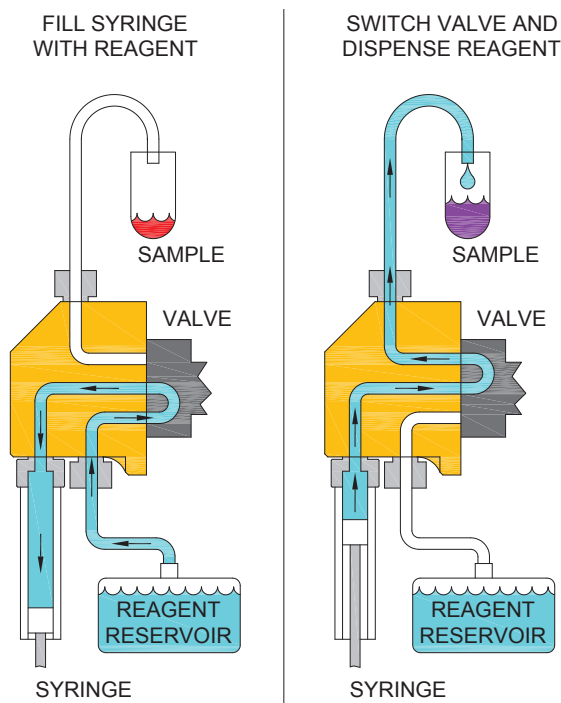
Smart Syringe Pump Using Embedded Controller

- Commands sent directly from the OEM System embedded controller to the motion control firmware built into the Smart Syringe Pump
- Supports RS232 and CAN communications

Fluid Flow Diagrams



Reagent Addition



Chemical Compatibility Chart*

Chemical	Valve Diaphragm	Other Wetted Materials	
	FFKM (Kalrez®)	PEEK	Ultem®
DI Water	1	1	1
Methanol	1	1	1
Isopropanol	1	1	1
Ethanol	1	1	1
Acetonitrile	1	1	4
Tetrahydrofuran	1	1	1
Toluene	1	1	2
Organic Acids - Dilute	1	1	1-2
Non Organic Acids - Dilute	1	1	1
Bases - Dilute	1	1	1
Saline	1	1	1
Bleach 12%	2	1-2	4
Sodium Hydroxide 20%	1	1	4

Compatibility Legend

1. EXCELLENT
Minimal or no effect
2. GOOD
Possible swelling and/or loss of physical properties
3. DOUBTFUL
Moderate or severe swelling and loss of physical properties
4. NOT RECOMMENDED
Severe effect and should not be considered

*The above is an Abbreviated Chemical Compatibility Chart. Please consult factory for details.

Regulatory

Regulatory: CE

EMC:


FCC Part 15 Subpart B, Class B

EMC Directive (2004/108/EC)

EN 61326-1:2006 Standard

- CISPR 11 Radiated Emissions Class B
- IEC 61000-4-2:2008 Electrostatic Discharge Criterion A
- IEC 61000-4-3:2006 Radiated RF Immunity Criterion A
- IEC 61000-4-8:2009 Power Frequency Magnetic Field Immunity Criterion A

Safety: IEC 61010-2-101 (design review)

Hazardous Materials: RoHS Directive (2002/95/EC) 

Ordering Information

Manifold	Porting	Valve	Pressure Rating	Internal Control Board	Part Number
Ultem®	1/4 - 28 Female	3 Way FFKM	29PSI (2.0 bar)	Yes	401-101111-000

Accessories

Part Number	Description
990-000452-001	50µL Syringe Barrel with Teflon® Plunger tip
990-000452-002	100µL Syringe Barrel with Teflon® Plunger tip
990-000452-003	250µL Syringe Barrel with Teflon® Plunger tip
990-000452-004	500µL Syringe Barrel with Teflon® Plunger tip
990-000452-005	1mL Syringe Barrel with Teflon® Plunger tip
191-000264-001	Clasp Screw
193-000029-001	Clasp Screw Locking Nut
590-000111-001	Cable, Smart Syringe Pump
190-006055-004	P Clamp
191-000115-001	P Clamp Screw for Tubing
890-001099-001	Probe Tip, Sized for 100µL Syringe Barrel
790-007025-001	Smart Syringe Pump Software
990-000445-001	Evaluation Kit

Smart Syringe Pump Evaluation kit:

The Parker Smart Syringe Pump Evaluation kit contains everything needed to set up and start testing the Smart Syringe Pump in less than 15 minutes time. The Smart Syringe Pump Windows® based software provides a fast and easy way to evaluate pump performance using a simple point and click graphical user interface. Install the software on any Windows® PC, connect the RS232 cable to a serial port (or USB to Serial adapter) and connect the power cable to your 24 V power supply and start testing. It couldn't be easier.

The kit includes:

- Parker Smart Syringe Pump
- Software
- Power and communication cables
- Syringe Barrels (100 µL and 1000µL)
- Probe tip
- Tubing and fittings
- Contact Parker to order at 603.595.1500

Please click on the Order On-line button below (or go to www.parker.com/ppf/smartsyringepump) for more information on the Parker Smart Syringe Pump.

NOTE: In order to provide the best possible solution for your application, please provide the following requirements when contacting ApplicationsEngineering:

- Accuracy and Precision Required
- Operating Pressure
- Power Consumption
- Life Requirement
- Description of pump function in the application
- Size
- Flow Rate Required
- Liquids
- Voltage
- Communications Protocol
- Motion Required





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