



## BS-8002X / BS-8004X Micro-Fluidic Syringe Pumps

### Specifications

<u>Model</u>	<u>Style</u>	<u>Stall Detection</u>	<u>Number of Syringes</u>	<u>Maximum Syringe Size</u>
BS-8004X	Stand-Alone	Yes	2	60 mL; 140 mL partially filled
BS-4502X	OEM	Yes	2	60 mL; 140 mL partially filled

### **Mechanical**

Motor type: Step motor  
Motor steps per revolution: 400  
Motor gearbox reduction: 25:1  
Motor to drive screw ratio: 15/28  
Drive screw pitch: 20.32 revolutions/"  
Micro-stepping: 1/16 to 1/2 depending on motor speed  
Advance per step: 4.185267857 nm to 33.4821429 nm depending on motor speed

Dimensions: 8 3/4" x 5 3/4" x 4 1/2" (LxWxH) (Non-OEM versions)  
(22.86 cm x 14.605 cm x 11.43 cm)  
Weight: 3.8 lbs. (1.63 kg)

### **Electrical**

Power supply type: External wall adapter, power source specific  
Power supply output rating: 12V DC @ 1000 mA  
Power connector: 2.1 mm, center positive, DC  
Voltage at power connector: 12V DC at full load  
Amperage: 750 mA at full load

### **Operational**

Accuracy: Within 1% error  
Reproducibility: Within 0.1% error  
Maximum force: 150 lbs. at minimum speed, 18 lbs. at maximum speed  
Syringe inside diameter range: 0.100 to 50.00 mm  
Maximum speed: 0.220934197 cm/min  
Minimum speed: 8.27653E-05 cm/hr  
Maximum pumping rate: 1226 µL/min with a B-D 60 mL syringe  
Minimum pumping rate: 14.36 nL/hr with a B-D 1 mL syringe  
Number of Program Phases: 41  
RS-232 pump network: 100 pumps maximum  
RS-232 selectable baud rates: 300, 1200, 2400, 9600, 19200

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Syringe Manufacturer (all names ™)	Syringe (mL)	Inside Diameter (mm)	Maximum Rate (µL/hr)	Minimum Rate (nL/hr)	Maximum Rate (µL/min)				
B-D	1	4.699	2298	14.36	38.31				
	3	8.585	7673	47.91	127.8				
	5	11.99	9999	93.45	249.4				
	10	14.43	9999	135.4	361.3				
	20	19.05	9999	236	629.7				
	30	21.59	9999	303.1	808.8				
	60	26.59	9999	459.6	1226				
HSW Norm-Ject	1	4.69	2290	14.3	38.16				
	3	9.65	9695	60.54	161.5				
	5	12.45	9999	100.8	268.9				
	10	15.9	9999	164.4	438.6				
	20	20.05	9999	261.4	697.5				
	30	22.9	9999	340.9	909.9				
	50	29.2	9999	554.3	1479				
Monoject	1	5.74	3430	21.42	57.17				
	3	8.941	8322	51.97	138.7				
	6	12.7	9999	104.9	279.8				
	12	15.72	9999	160.7	428.8				
	20	20.12	9999	263.2	702.4				
	35	23.52	9999	359.6	959.9				
	60	26.64	9999	461.4	1231				
	140	38	9999	938.7	2505				
Terumo	1	4.7	2299	14.36	38.33				
	3	8.95	8339	52.07	138.9				
	5	13	9999	109.9	293.2				
	10	15.8	9999	162.3	433.1				
	20	20.15	9999	264	704.5				
	30	23.1	9999	346.9	925.9				
	60	29.7	9999	573.4	1530				
Poulten & Graf (Glass)	1	6.7	4673	29.19	77.89				
	2	8.91	8265	51.61	137.7				
	3	9.06	8545	53.36	142.4				
	5	11.75	9999	89.75	239.5				
	10	14.67	9999	139.9	373.4				
	20	19.62	9999	250.3	667.9				
	30	22.69	9999	334.7	893.3				
	50	26.96	9999	472.5	1261				
Steel Syringes	1	9.538	9471	59.14	157.8				
	3	9.538	9471	59.14	157.8				
	5	12.7	9999	104.9	279.8				
	8	9.538	9471	59.14	157.8				
	20	19.13	9999	237.9	635				
	50	28.6	9999	531.8	1419				
	Syringe (µL)	Inside Diameter (mm)	Maximum Rate (µL/hr)	Minimum Rate (nL/hr)	SGE Syringe (mL)	Inside Diameter (mm)	Maximum Rate (µL/hr)	Minimum Rate (nL/hr)	
SGE (Glass – Gas Tight)	5	0.343	12.24	0.077	0.25	1.03	110.4	0.69	
	10	0.485	24.48	0.153	0.5	3.257	1104	6.896	
	25	0.728	55.17	0.345	1	4.606	2208	13.8	
	50	1.03	110.4	0.69	2.5	7.284	5523	34.49	
	100	1.457	221	1.38	5	10.3	9999	68.97	
Hamilton Microliter (Glass)	0.5	0.103	1.104	0.007	10	14.57	9999	138	
	1	0.1457	2.21	0.014	25	23.03	9999	344.8	
	2	0.206	4.418	0.028	50	27.5	9999	491.6	
	5	0.3257	11.04	0.069	100	34.99	9999	795.9	