



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 |

Your Distributor is:
 Braintree Scientific, Inc.
 PO Box 850498, Braintree, MA 02185
 781-917-9526
 Email: Info@braintreesci.com
 Web: www.braintreesci.com

| 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 | |

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