

NE-4000 Two Channel Syringe Pump

Continuous Infusion
Dual Syringe Pump System
DUAL-NE-4000

Microfluidics Two Channel
Syringe Pump
NE-4002X

BUILT FOR AUTOMATION



NE-4000 Features:

Accepts 2 different syringes from the smallest size available up to 60 mL. A 140 mL syringe can be filled up to 120 mL. 2 different size syringes can be used for proportional infusion. NE-4000 & Dual-NE-4000 pumping rate as low as 1.459 $\mu\text{L/hr}$ with a 1 mL syringe or as high as 127.2 mL/min with a 60 mL syringe. NE-4002X pumping rate as low as .008 nL/hr with a 0.5 μL syringe or as high as 1555 $\mu\text{L/min}$ with a 60 mL syringe.

The NE-1000 Series of Syringe Pumps Features

- Built for Automation
- Operates stand-alone or from a computer
- Infuses and withdraws
- Applications range from simple infusions to complex pumping programs
- Programmable preset protocols
- Program up to 41 pumping phases: change pumping rates, set dispensing volumes, insert pauses, control and respond to external signals, sound the buzzer.
- RS-232 and TTL logic control interfaces

Two pumps connected with a dual cable create a Dual Pump System allowing for continuous infusion or emulsification. Network, control, and monitor up to 100 pumps with one computer. Worldwide power supplies available. Motor stall detection. Non-volatile memory of all parameters and programming. Upgradeable to the X and X2 advanced firmware versions for gradient pumping and increased program memory. Dispensing accuracy of $\pm 1\%$. Unlimited lifetime technical support. Two year warranty. Plus many, many more features!

****Not For Clinical Use On Humans****



NE-4000 & NE-4500 Programmable Double Syringe Pumps

Maximum and Minimum Flow Rates

Syringe Manufacturer (all names TM)	Syringe (mL)	Inside Diameter (mm)	Maximum Rate (mL/hr)	Minimum Rate (μL/hr)	Maximum Rate (mL/min)			
B-D	1	4.699	188.1	1.436	3.135			
	3	8.585	627.9	4.791	10.46			
	5	11.99	1224	9.345	20.41			
	10	14.43	1774	13.54	29.56			
	20	19.05	3091	23.59	51.53			
	30	21.59	3971	30.3	66.19			
	60	26.59	6023	45.96	100.3			
HSW Norm-Ject	1	4.69	187.4	1.43	3.123			
	3	9.65	793.4	6.054	13.22			
	5	12.45	1320	10.08	22.01			
	10	15.9	2153	16.44	35.89			
	20	20.05	3425	26.14	57.08			
	30	22.9	4468	34.09	74.46			
	50	29.2	7264	55.43	121			
Monoject	1	5.74	280.7	2.142	4.678			
	3	8.941	681.1	5.197	11.35			
	6	12.7	1374	10.49	22.9			
	12	15.72	2105	16.07	35.09			
	20	20.12	3449	26.32	57.48			
	35	23.52	4713	35.96	78.55			
	60	26.64	6046	46.14	100.7			
	140	38	9999	93.87	205			
Terumo	1	4.7	188.2	1.436	3.136			
	3	8.95	682.4	5.207	11.37			
	5	13	1439	10.99	23.99			
	10	15.8	2126	16.23	35.44			
	20	20.15	3459	26.4	57.65			
	30	23.1	4546	34.69	75.77			
	60	29.7	7515	57.34	125.2			
Poulsen & Graf (Glass)	1	6.7	382.4	2.919	6.374			
	2	8.91	676.3	5.161	11.27			
	3	9.06	699.3	5.336	11.65			
	5	11.75	1176	8.975	19.6			
	10	14.67	1833	13.99	30.56			
	20	19.62	3279	25.03	54.66			
	30	22.69	4386	33.47	73.1			
Steel Syringes	50	26.96	6192	47.25	103.2			
	1	9.538	775.1	5.914	12.91			
	3	9.538	775.1	5.914	12.91			
	5	12.7	1374	10.49	22.9			
	8	9.538	775.1	5.914	12.91			
	20	19.13	3118	23.79	51.96			
	50	28.6	6969	53.18	116.1			
SGE (Glass – Gas Tight)	Syringe (μL)	Inside Diameter (mm)	Maximum Rate (μL/hr)	Minimum Rate (μL/hr)	SGE Syringe (mL)	Inside Diameter (mm)	Maximum Rate (μL/hr)	Minimum Rate (μL/hr)
	5	0.343	1002	0.008	0.25	2.303	45.18	0.345
	10	0.485	2004	0.016	0.5	3.257	90.38	0.69
	25	0.728	4515	0.035	1	4.606	180.7	1.38
	50	1.03	9039	0.069	2.5	7.284	452	3.449
Hamilton Microliter (Glass)	100	1.457	9999	0.138	5	10.3	903.9	6.897
	0.5	0.103	90.39	0.001	10	14.57	1808	13.8
	1	0.146	181.6	0.002	25	23.03	4518	34.48
	2	0.206	361.5	0.003	50	27.5	6443	49.16
	5	0.326	905.4	0.007	100	34.99	9999	79.59

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Specifications

<u>Model</u>	<u>Style</u>	<u>Stall Detection</u>	<u>Number of Syringes</u>	<u>Maximum Syringe Size</u>
NE-4000	Stand-Alone	Yes	2	60 mL; 140 mL partially filled
NE-4500	OEM	No	2	60 mL; 140 mL partially filled
NE-4501	OEM	Yes	2	60 mL; 140 mL partially filled

Mechanical

Motor type:	Step motor
Motor steps per revolution:	200
Motor to drive screw ratio:	15/28
Drive screw pitch:	20.32 revolutions/”
Micro-stepping:	1/8 to 1/2 depending on motor speed
Advance per step:	0.41852679 μ m to 1.67410714 μ m 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:	1000 mA at full load

Operational

Accuracy:	Within 1% error
Reproducibility:	Within 0.1% error
Maximum force:	100 lbs. at minimum speed, 18 lbs. at maximum speed
Syringe inside diameter range:	0.100 to 50.00 mm
Maximum speed:	18.08035714 cm/min
Minimum speed:	0.008276531 cm/hr
Maximum pumping rate:	6023 mL/hr with a B-D 60 mL syringe
Minimum pumping rate:	1.436 μ L/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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