

# THE MOST PUBLISHED SYRINGE PUMP SETS A *NEW* STANDARD!



## PUMP 11 Elite



- TOUCH SCREEN FOR EASE-OF-USE
- OUTSTANDING FLOW PERFORMANCE
- PROGRAM SIMPLE TO COMPLEX METHODS WITHOUT A PC
- DOWNLOAD METHODS TO YOUR PUMP OR EMAIL TO PEERS

**HARVARD**  
APPARATUS

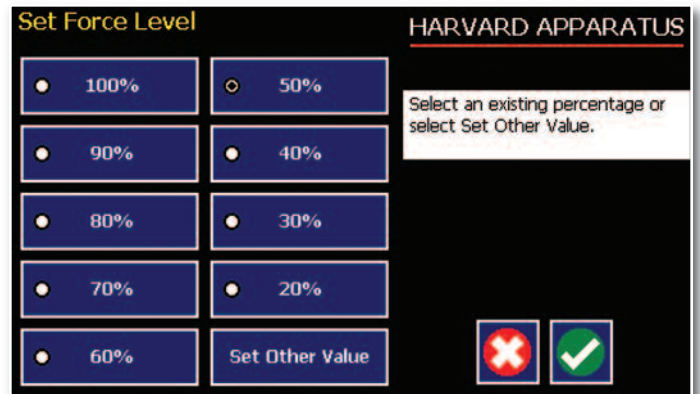
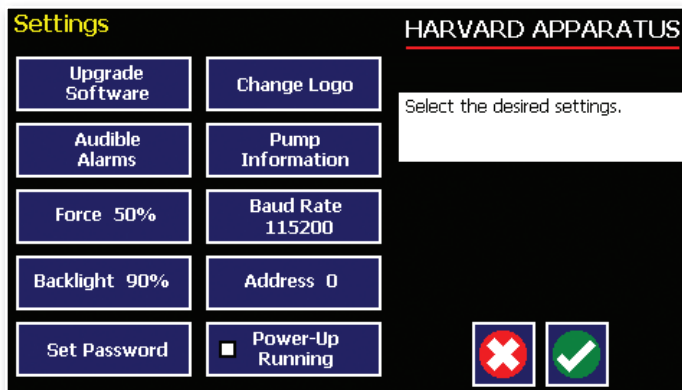
[www.harvardapparatus.com](http://www.harvardapparatus.com)

# THE NEW PUMP 11 Elite SYRINGE PUMPS

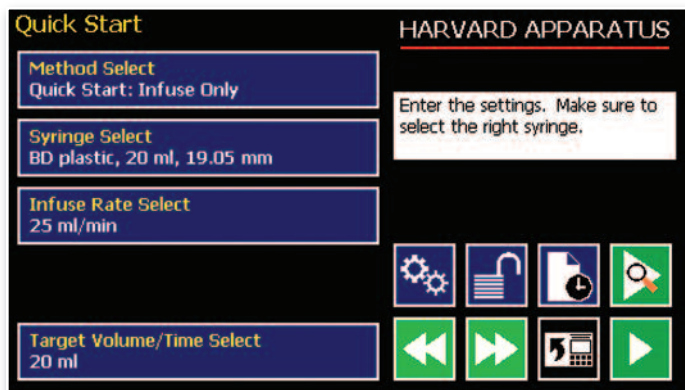
The Pump 11 Elite is the most utilized and published series of syringe pumps in the world for research applications.

The Pump 11 Elite Series new capabilities include:

- Unparalleled ease-of-use with alphanumeric keypad for easy Method naming and recall
- Application versatility with wide range of flow rates with adjustable force across the entire flow rate range:
  - > Pump 11 Elite is from 1.28 pl/min to 88.28 ml/min
  - > Pico Plus Elite is from 0.54 pl/min to 11.70 ml/min
- Superior performance and legendary reliability with a 2 year warranty
- Specialized accessories including in-line solution heaters and coolers, valves, microfluidic chips, swivels, tethers, syringes, tubing, connectors, etc.



# UNPARALLELED EASE-OF-USE

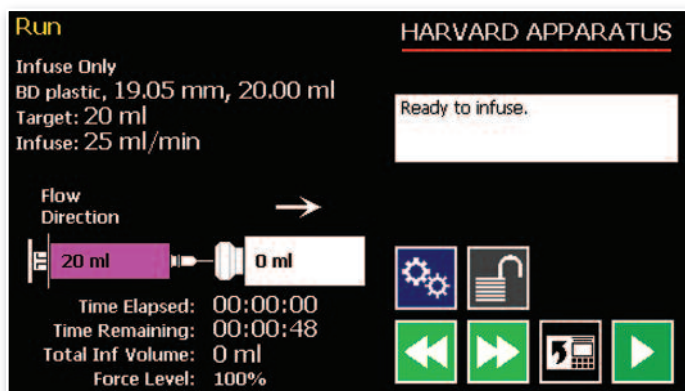


### Quick Start Screen

Quickly and easily run an infusion or withdrawal.

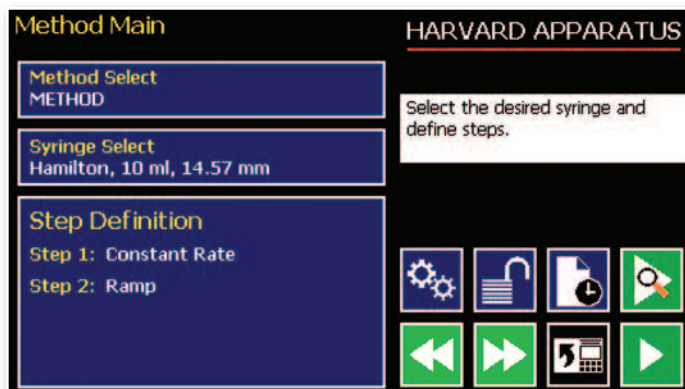
The Pump 11 Elite Series offers unparalleled ease-of-use with:

- High resolution LCD color touch screen user interface
- Quick Start Methods and Method Profiles allow you to create and run simple to complex Methods without complex programming or a PC
- Alphanumeric keypad allows you to quickly and easily name new Methods and recall saved Methods



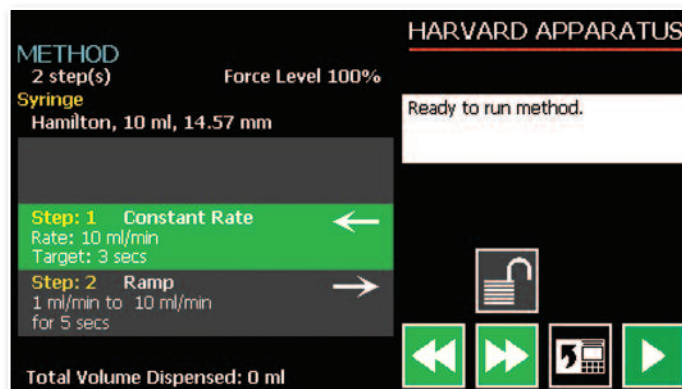
### Run Screen

For parameter and condition monitoring.



### Advanced Method Setup Screen

Quickly and easily run an advanced program.



### Advanced Method Run Screen

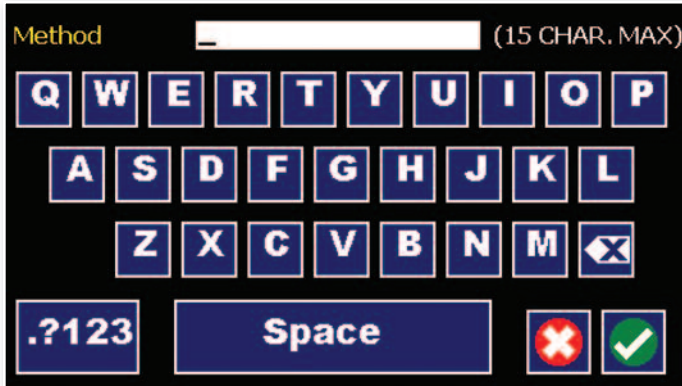
For parameter and condition monitoring of an advanced program.



# PROGRAM SIMPLE TO COMPLEX METHODS WITHOUT A PC

## Alphanumeric Capabilities

Alphanumeric keypad makes it easy to name new Methods and recall stored Methods.



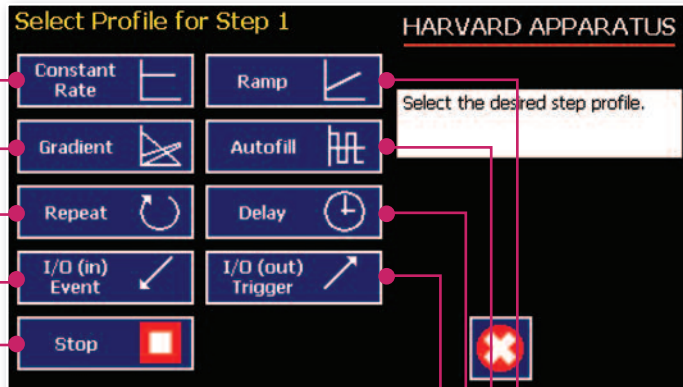
## Pre-Programmed and User-Defined Method Selection

Quick Start Methods are available on all Pump 11 Elite Syringe Pumps. User-Defined Methods are only available on Programmable models.



## Pre-Programmed Functions

Pre-programmed functions make developing simple to complex Methods easy.



### Stop:

Used to instruct the pump to stop operation. This command can be used in conjunction with I/O events to control pump operation based on external events.

### I/O (in) Event:

Used to have the pump pause and wait for a signal from an external device or for a manual user input on the touch screen. These external signals are communicated via Pin 2 on the 15-pin I/O connector port.

### Repeat:

Used to repeat steps in a Method a defined number of times. You can select what steps to repeat and how many times you want them repeated.

### Gradient Profile:

Used to combine multiple flow streams from different pumps into a common output stream. The flow profiles can be constant, ramped or stepped.

### Constant Rate Profile:

Used to infuse or withdraw at a user-defined flow rate until a target volume or target time is reached.

### Ramp:

Used to create a linearly increasing or decreasing infusion or withdrawal for a predefined time period.

### Autofill:

Is an automated infuse/withdraw or withdraw/infuse step that operates at constant but separately defined flow rates for the infuse and withdraw operations. The Autofill profile is designed to work in conjunction with an autofill valve that controls the switching of flows from a reservoir for refilling the syringe to the target infusion subject.

### Delay:

Used to insert a time delay in a Method. You can set a time delay between 0.2 seconds up to 99:99:99 (99 hours, 99 minutes, 99 seconds).

### I/O (out) Trigger:

Used to send a signal to an external device when the step in the Method is reached.



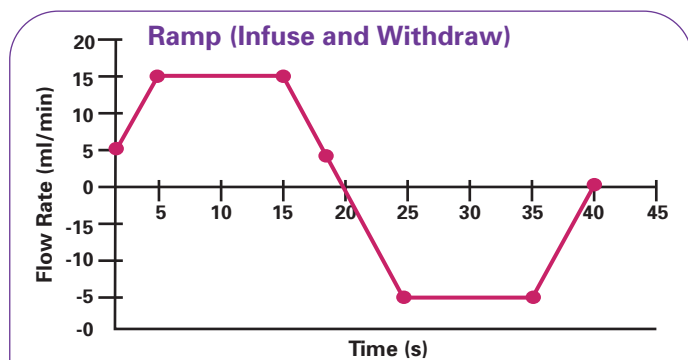
# EMAIL METHODS TO PEERS & DOWNLOAD METHODS TO YOUR PUMP

- Email Methods to peers
- Download Methods to your pump
- Upgrade new versions of software remotely



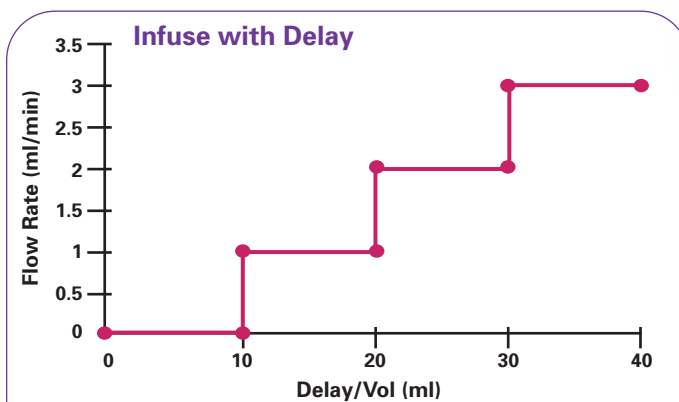
## PUMP 11 Elite SAMPLE METHODS

Program once, save and recall with the touch of a button, saving time and increasing efficiency.



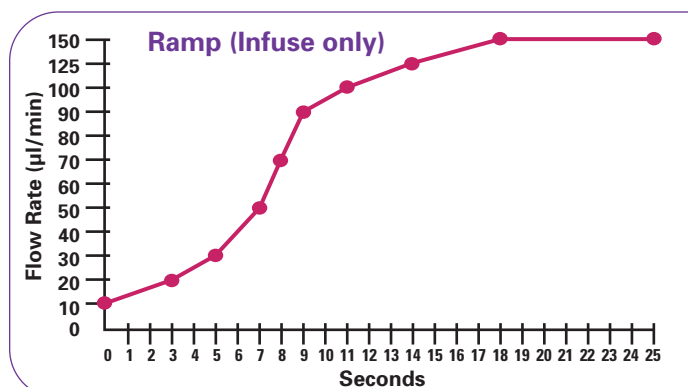
### SYRINGE - 5 ml Hamilton Glass

- STEP 1:** Ramp, Infuse, to 5 ml/min for 5 sec
- STEP 2:** Constant Rate, Infuse, 15.9 ml/min for 10 sec
- STEP 3:** Ramp, Infuse, 15.9 ml/min to 5 ml/min for 5 sec
- STEP 4:** Ramp, Withdraw, 5 ml/min to 15.9 ml/min for 5 sec
- STEP 5:** Constant Rate, Withdraw, 15.9 ml/min for 10 sec
- STEP 6:** Ramp, Withdraw, 15.9 ml/min to 5 ml/min for 5 sec



### SYRINGE - 5 ml BD

- STEP 1:** Delay for 10 sec
- STEP 2:** Constant Rate, Infuse, 1 ml/min for 10 sec
- STEP 3:** Constant Rate, Infuse, 2 ml/min for 10 sec
- STEP 4:** Constant Rate, Infuse, 3 ml/min for 10 sec



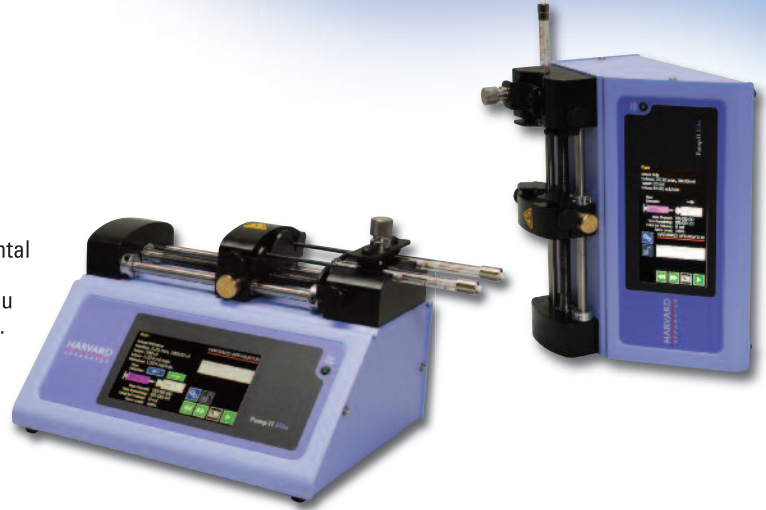
### RAMP - Infuse Only

- STEP 1:** Ramp, Infuse, 10 µl/min to 20 µl/min in 3 sec
- STEP 2:** Ramp, Infuse, 20 µl/min to 30 µl/min in 2 sec
- STEP 3:** Ramp, Infuse, 30 µl/min to 50 µl/min in 2 sec
- STEP 4:** Ramp, Infuse, 50 µl/min to 70 µl/min in 1 sec
- STEP 5:** Ramp, Infuse, 70 µl/min to 90 µl/min in 1 sec
- STEP 6:** Ramp, Infuse, 90 µl/min to 100 µl/min in 2 sec
- STEP 7:** Ramp, Infuse, 100 µl/min to 125 µl/min in 3 sec
- STEP 8:** Ramp, Infuse, 125 µl/min to 150 µl/min in 4 sec
- STEP 9:** Constant Rate, Infuse, 150 µl/min for 7 sec

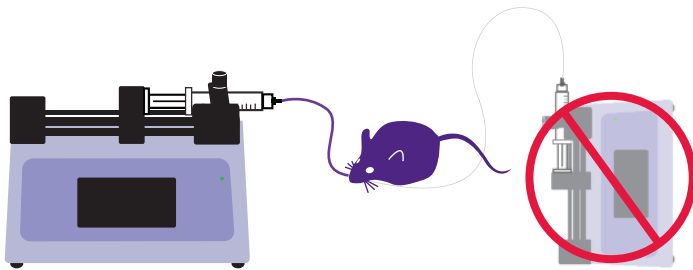


# APPLICATION VERSATILITY

The Pump 11 Elite Syringe Pumps have the ability to run in a horizontal or vertical orientation. This helps to minimize the dead volume depending upon the height of the tubing connection. This allows you to choose the proper orientation based on your experimental setup.

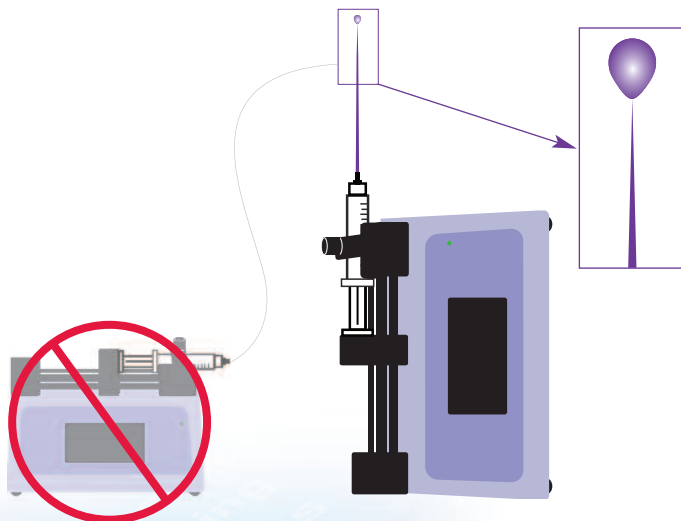


## ANIMAL INFUSION HORIZONTAL ORIENTATION



During an animal infusion the tubing connection should be very close to the bench. The horizontal orientation of the Pump 11 Elite allows for minimal tubing and minimal dead volume for maximum experimental optimization.

## ELECTROSPRAY (ESI) VERTICAL ORIENTATION



On an ESI setup for sample introduction, the ESI source is high off the bench so the vertical configuration of the Pump 11 Elite allows for minimal tubing length and minimal dead volume for maximum experimental optimization.

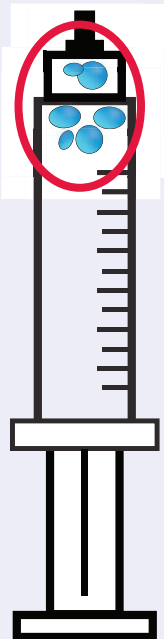
## BUBBLE CLEARING VERTICAL ORIENTATION

Using horizontal orientation, clearing bubbles can be difficult



When priming syringes to run automatically, a difficult problem is to overcome bubbles. The Pump 11 Elite Syringe Pumps series permits easy priming of syringes to eliminate bubbles. Simply orient the pump in the vertical position. The bubbles float to the top of the syringe. Combine this with the Elite's programming and you can run the pump to automatically clear bubbles.

Using vertical orientation, bubbles float to top of syringe for easy clearing

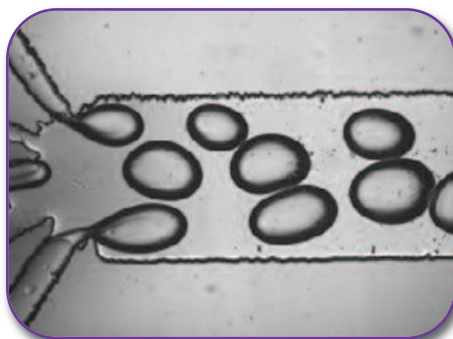


APPLICATION VERSATILITY

# EXTENSIVE APPLICATIONS

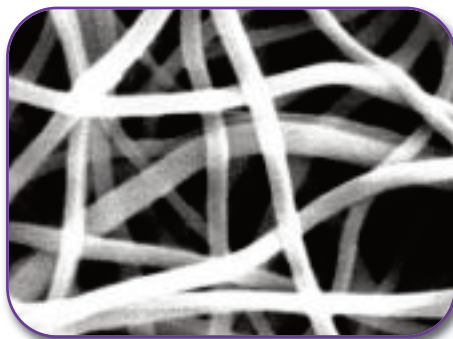
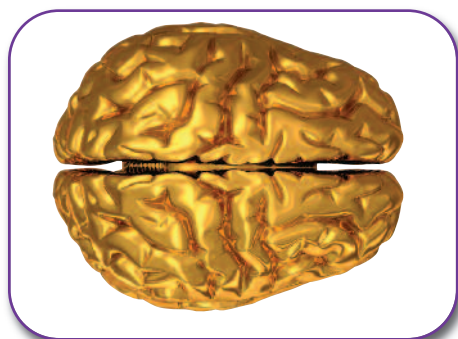
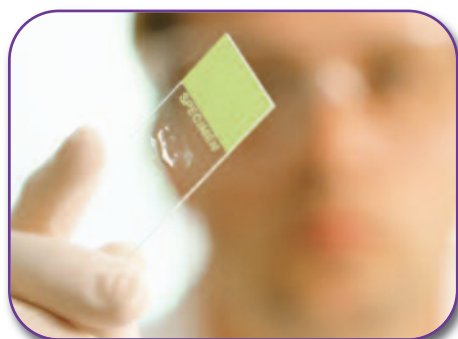
- Accurate Delivery of Coating
- Animal Feeding
- Bulk Fluid Transfer
- Calibration
- Cell Culture
- Cellular Injection

- Dispensing
- Doping
- Drug Delivery (same infusion rates)
- Drug Delivery (different infusion rates)



- Drug Delivery (time released)
- Drug Development
- Electrospinning
- Emulsification
- Electropray
- Fluid Blending
- Fluid Sampling
- Gradients
- HPLC
- Injection Pressure Calculations
- Instrument Injections
- Low Pressure Chromatography

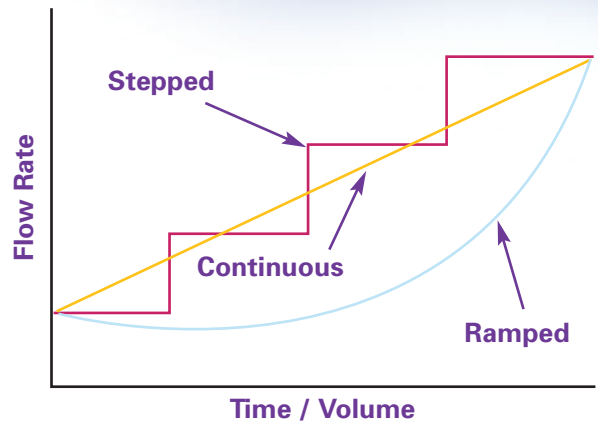
- Mass Spectrometry
- Medical Coating Delivery
- Microdialysis
- Microfluidics
- Nanofluidics
- Nutritional Studies
- Oocyte Applications
- Patch Clamping
- Perfusion
- Timed Delivery
- Titrations



# % COMPOSITION

The Pump 11 Elite can perform automatic binary mixtures by % composition. This is useful for delivering different percent mixtures of drugs or nutrients with easy programming of either continuous or stepped composition profiles.

- Serial dilutions
- Chromatography
- Infusing different percentages of drugs or nutrients
- Change polymer ratio

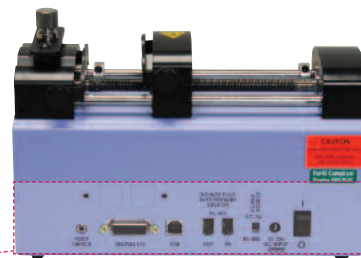


# ADVANCED CONNECTIVITY

The infusion only Pump 11 Elite syringe pumps come standard with a Footswitch and USB connectors. The infusion/withdrawal programmable Pump 11 Elite syringe pumps come standard with a Footswitch, USB, RS-485 and I/O connectors. There is also an option for RJ-11 connectors on the programmable pumps. This option has to be ordered at the time the pump is ordered.

- **Footswitch Input - start and stop a pump**
- **USB Serial Input - control your pump with a computer**
- **RS-485 Connectors**
  - > Connect multiple pumps together (daisy chain up to 99 pumps)
  - > Connect Satellite pumps to the Master pump for binary gradient system (% composition)
- **User I/O Connector**
  - > Direction Control Input - set pump to infuse or withdraw
  - > Trigger Input - connect an external device to start and stop a pump or Method
  - > Footswitch Input - start and stop a pump
  - > Trigger 1 Output - signal another device to start and stop a pump or Method
- **Run indicator – connect an external LED or monitoring device to a pump**

**CONTROL MULTIPLE PUMPS VIA DAISY CHAIN WITH RS-485**



**OPTIONAL RJ-11 CONNECTORS**  
(for Pump-to-Pump Communication)



**FOOTSWITCH INPUT**

**USB SERIAL INPUT**  
(for communication from PC)

**RS-485 CONNECTORS**  
(for pump-to-pump communication)

**UNIVERSAL POWER INPUT**

**USER I/O CONNECTOR**



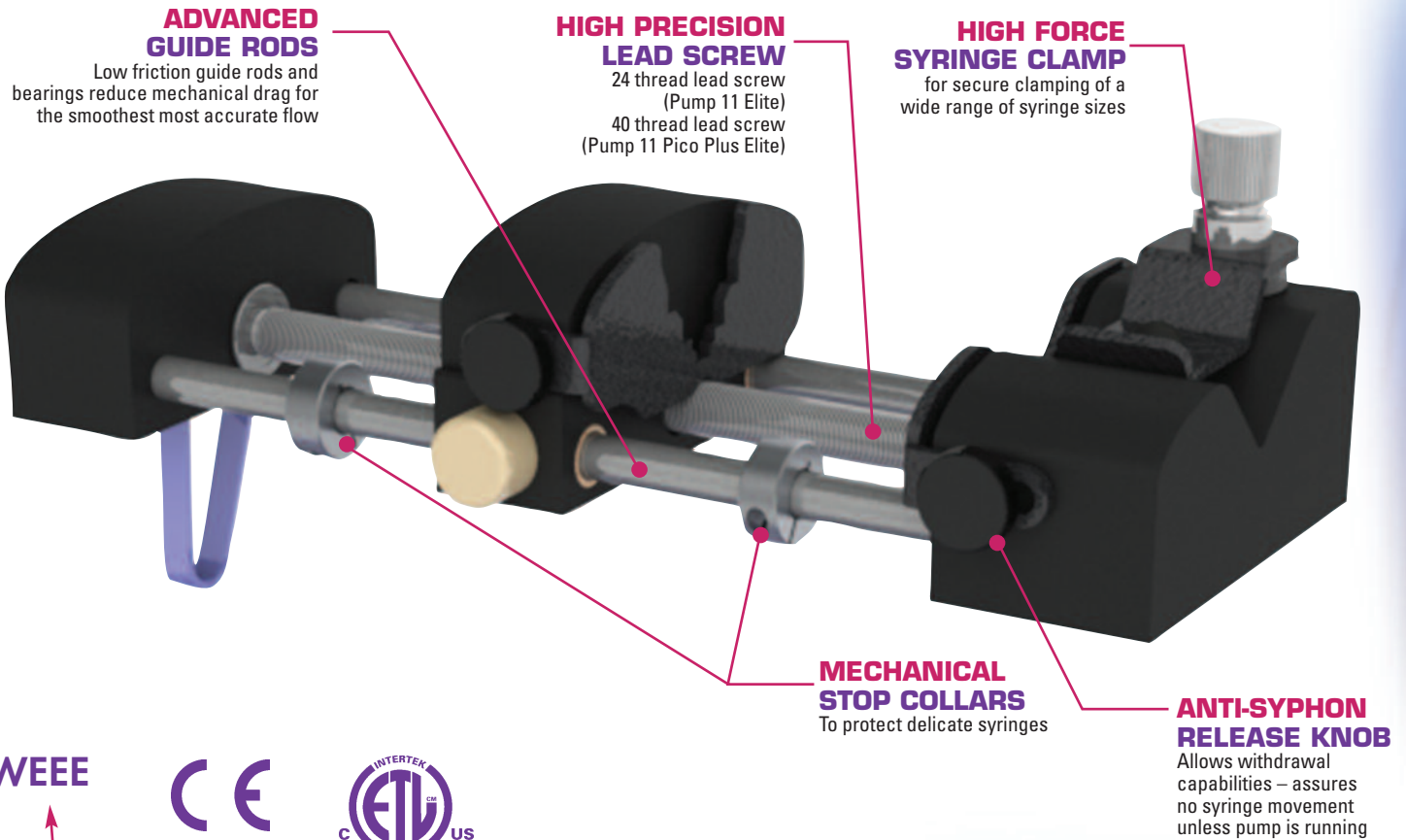


# SUPERIOR PERFORMANCE & LEGENDARY RELIABILITY



The Pump 11 Elite carries on the tradition as the premier workhorse infusion pump with a combination of durable patented design and high performance fluidics. The Pump 11 Elite Series and Pump 11 Pico Plus Elite have high accuracy and precise flows from 1.28 pl/min to 88.28 ml/min (25.99 ml/min for dual syringe) and 0.54 pl/min to 11.70 ml/min respectively.

With up to 35 lbs of linear force this rugged syringe pump will provide years of performance for a wide range of applications.



WEEE

CE

INTERTEK ETV LISTED US

CB Scheme

RoHS

Global regulatory compliance assures you high performance anywhere in the world.



# HARVARD APPARATUS SPECIALIZED ACCESSORIES

## 'ONE STOP' ADVANTAGE FOR ALL APPLICATIONS

- Syringes
- Connectors
- Tubing
- Needles
- Valves
- Syringe Warmers
- Warmed Platforms
- In-line Solution Heaters
- Microfluidic Chips
- Cell Perfusion Chambers
- Swivels
- Tethers

## GLASS SYRINGES

Sizes ranging from 0.5µl to 100ml. Choose glass syringes when high accuracy, sterility and low to medium force are required. Accuracy is 1%.



### 1000 Series GASTIGHT® Glass Syringes

Teflon® PTFE tipped plungers. Replaceable plungers and needles. Sizes: 1 to 100 ml, Terminus: LT, TLL, RN, C. Syringes supplied individually. Replacement needles are sold in packages of 6.



### 1700 Series GASTIGHT® Glass Syringes

Teflon® PTFE tipped plungers. Replaceable plungers and needles. Sizes: 10 to 500 µl. Syringes supplied individually. Replacement needles are sold in packages of 6.

#### 1000 Series GASTIGHT® Syringes

Order #	Volume	Ter.	Point Style	Ga.	Replacement Parts	
					Needle (pkg. of 6)	Plunger Assembly
72-1826	1 ml	LT	-	-	-	72-1894
72-1827	1.25 ml	LT	-	-	-	72-1895
72-1828	2.5 ml	LT	-	-	-	72-1896
72-1829	5 ml	LT	-	-	-	72-1897
72-1830	10 ml	LT	-	-	-	72-1898
72-1831	1 ml	TLL	-	-	-	72-1894
72-1832	2.5 ml	TLL	-	-	-	72-1896
72-1833	5 ml	TLL	-	-	-	72-1897
72-1834	10 ml	TLL	-	-	-	72-1898
72-1835	25 ml	TLL	-	-	-	72-1899
72-1836	50 ml	TLL	-	-	-	72-1900
72-1837	100 ml	TLL	-	-	-	-
72-1838	1 ml	RN	2	22	72-7139	72-1894
72-1839	2.5 ml	RN	2	22	72-7139	72-1896
72-1840	5 ml	RN	2	22	72-7139	72-1897
72-1841	10 ml	RN	2	22	72-7139	72-1898
72-1842	1 ml	C	-	1/4-28	-	72-1894
72-1843	2.5 ml	C	-	1/4-28	-	72-1896
72-1844	5 ml	C	-	1/4-28	-	72-1897
72-1845	10 ml	C	-	1/4-28	-	72-1898

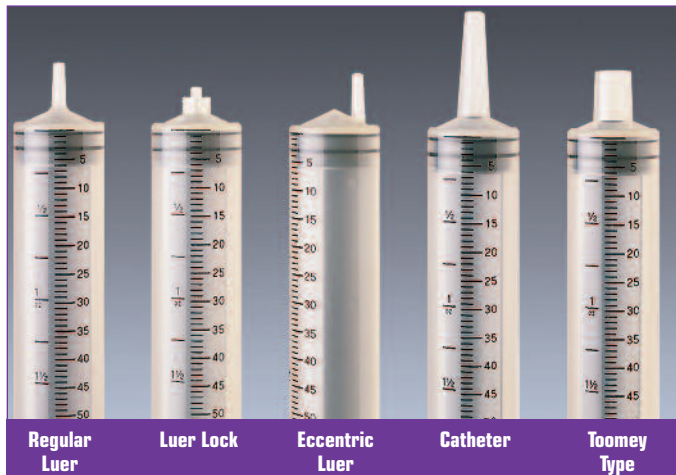
#### 1700 Series GASTIGHT® Syringes

Order #	Volume	Ter.	Point Style	Ga.	Replacement Parts		
					Needle (pkg. of 6)	Plunger Assembly	Barrel
72-1862	10 µl	LT	-	-	-	72-1785	-
72-1863	25 µl	LT	-	-	-	72-1786	-
72-1864	50 µl	LT	-	-	-	72-1787	-
72-1765	100 µl	LT	-	-	-	72-1788	-
72-1766	250 µl	LT	-	-	-	72-1789	-
72-1767	500 µl	LT	-	-	-	72-1790	-
72-1824	5 µl	RN	3	32	72-5743	Call	-
72-1825	10 µl	RN	3	32	72-5743	72-1785	-
72-1768	10 µl	RN	2	26s	72-5744	72-1785	-
72-1769	25 µl	RN	2	22s	72-5745	72-1786	-
72-1770	50 µl	RN	2	22s	72-5745	72-1792	-
72-1771	100 µl	RN	2	22s	72-5745	72-1793	-
72-1772	250 µl	RN	2	22s	72-5746	72-1794	-
72-1773	500 µl	RN	2	22	72-7139	72-1795	-
72-1774	10 µl	RN	3	22s	72-5751	72-1785	-
72-1775	25 µl	RN	3	22s	72-5751	72-1786	-
72-1776	50 µl	RN	3	22s	72-5751	72-1792	-
72-1777	100 µl	RN	3	22s	72-5751	72-1793	-
72-1778	250 µl	RN	3	22s	72-5753	72-1794	-
72-1779	500 µl	RN	3	22	72-5752	72-1795	-
72-1781	50 µl	TLL	-	-	-	72-1792	72-1797
72-1782	100 µl	TLL	-	-	-	72-1793	72-1798
72-1783	250 µl	TLL	-	-	-	72-1794	72-1799
72-1784	500 µl	TLL	-	-	-	72-1795	72-1800
72-1780	25 µl	TLLX	-	-	-	72-1791	72-1796
72-1901	50 µl	TLLX	-	-	-	72-1808	72-1797
72-1902	100 µl	TLLX	-	-	-	72-1809	72-1798
72-1903	250 µl	TLLX	-	-	-	72-1810	72-1799
72-1904	500 µl	TLLX	-	-	-	72-1811	72-1800
72-1801	10 µl	CX	1/4-28	-	-	-	-
72-1802	25 µl	CX	1/4-28	-	-	72-1791	72-1906
72-1803	50 µl	CX	1/4-28	-	-	72-1808	72-1907
72-1804	100 µl	CX	1/4-28	-	-	72-1809	72-1908
72-1805	250 µl	CX	1/4-28	-	-	72-1810	72-1909
72-1806	500 µl	CX	1/4-28	-	-	72-1811	72-1910



# PLASTIC SYRINGES

Sizes ranging from 1 ml to 140 ml. Choose plastic syringes when accuracy, sterility, disposability and low force are required. Accuracy is 5%.



## Sterile Monoject® Syringes without Needles

Volume	Tip	Boxes of Syringes		Cases of Syringes	
		Quantity	Order #	Quantity	Order #
1 ml	Luer (long barrel)	100	72-2359	500	72-2379
1 ml	Luer	100	72-2360	500	72-2380
3 ml	Luer	100	72-2361	1000	72-2381
6 ml	Luer	50	72-2362	500	72-2382
6 ml	Luer Lock	50	72-2363	500	72-2383
12 ml	Luer	80	72-2364	480	72-2384
12 ml	Luer Lock	80	72-2365	480	72-2385
12 ml	Eccentric Luer	80	72-2366	480	72-2386
20 ml	Luer	50	72-2367	300	72-2387
20 ml	Luer Lock	50	72-2368	300	72-2388
20 ml	Eccentric Luer	50	72-2369	300	72-2389
35 ml	Luer	30	72-2370	180	72-2390
35 ml	Luer Lock	30	72-2371	180	72-2391
35 ml	Eccentric Luer	30	72-2372	180	72-2392
35 ml	Catheter	30	72-2373	180	72-2393
60 ml	Luer	20	72-2374	100	72-2394
60 ml	Luer Lock	20	72-2375	100	72-2395
60 ml	Eccentric Luer	20	72-2376	100	72-2396
60 ml	Catheter	20	72-2377	100	72-2397
60 ml	Toomey	20	72-2378	100	72-2398
140 ml	Luer Lock	-	-	20	72-2399

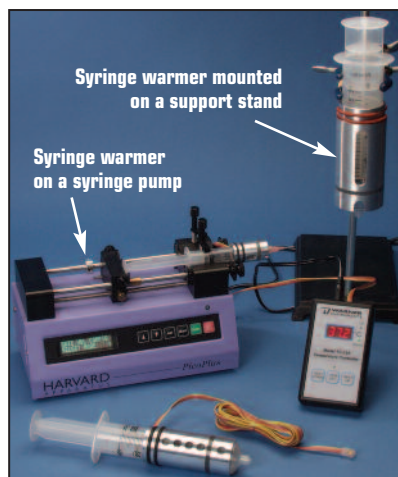
## Non-Sterile Monoject® Syringes without Needles

Volume	Tip	Boxes of Syringes		Cases of Syringes	
		Quantity	Order #	Quantity	Order #
3 ml	Luer	250	72-2400	1000	72-2408
6 ml	Luer	100	72-2401	500	72-2409
12 ml	Luer	100	72-2402	500	72-2410
12 ml	Eccentric Luer	100	72-2403	500	72-2411
20 ml	Luer	50	72-2404	250	72-2412
20 ml	Eccentric Luer	50	72-2405	250	72-2413
35 ml	Luer	25	72-2406	100	72-2414
60 ml	Luer	25	72-2407	155	72-2415
140 ml	Luer	-	-	20	72-2416
140 ml	Luer Lock	-	-	20	72-2417
140 ml	Catheter	-	-	20	72-2418

## Becton Dickinson Plastic Syringes

Order #	Syringe Siz	Graduation	Qty./Box
59-8377	3 ml	1/10 ml	100
59-8378	5 ml	1/5 ml	100
59-8379	10 ml (3/4 oz)	1/5 ml (1/8 oz)	100
59-8380	20 ml (1 oz)	1 ml (1/8 oz)	40
59-8381	30 ml (2 oz)	1 ml (1/4 oz)	40
59-8382	60 ml	1 ml	40

# SYRINGE WARMERS



## Specifications

Heater Resistance	18 Ω
Voltage Requirement	Variable to 12 V max
Temperature Range	Ambient to 65°C
Temperature Accuracy	±1°C
Cable Length	2.4 m
Warranty	One year

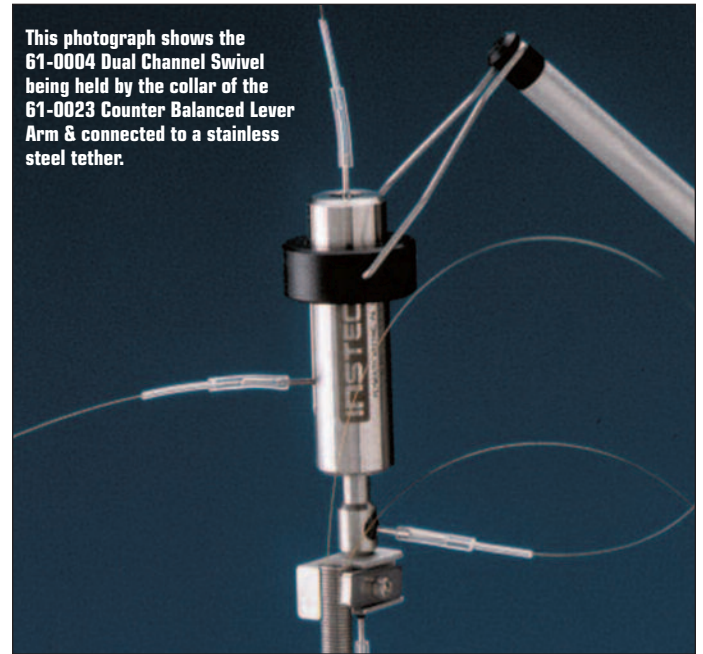
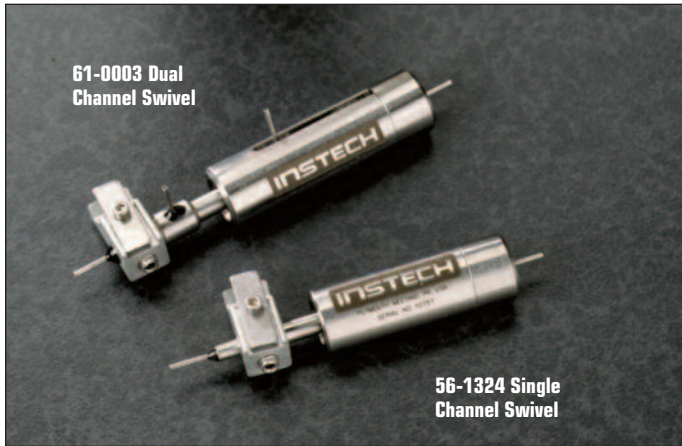
Model	Weight	Length	OD	ID	Syringe Type
SWS-10	32.7 g	38.2 mm	22.2 mm	16.2 mm	Becton Dickinson
SWS-60	76 g	83.7 mm	35.0 mm	29.1 mm	Becton Dickinson
SWS-140	192 g	109.5 mm	51.0 mm	41.4 mm	Monoject

Order #	Model	Product
64-1584	SWS-10	Syringe Heater for 10 cc Syringes
64-1560	SWS-60	Syringe Heater for 60 cc Syringes
64-1585	SWS-140	Syringe Heater for 140 cc Syringes
64-1545	TC-124A	Temp Controller, 120 VAC US
64-1545E	TC-124AE	Temp Controller, 240 VAC Europe
64-1655	TC-144	Temp Controller
64-1606	BAC-1	Battery Adapter Cable



# STAINLESS STEEL SWIVELS BY HARVARD/INSTECH

For continuous intravenous infusion or microdialysis on freely-moving rodents.

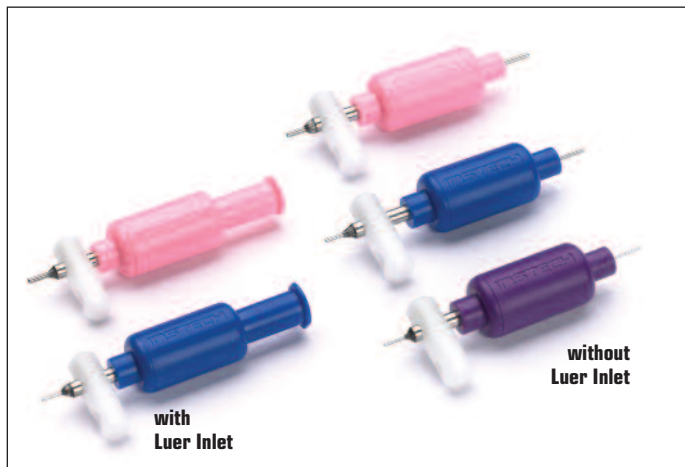


- Low torque quartz-lined dual channel swivel truly suited for microdialysis in mice
- Setting the industry standard for more than 30 years
- Single & dual channel models available
- Fully autoclavable
- Lifetime warranty on single channel swivels
- 20, 22 and 25 gauge available
- Custom swivels available by special order

Stainless Steel Swivels							
Application	Single Channel Swivels			Dual Channel Swivels			
Microdialysis for Mice and Rats					•		
Standard Infusion of Mice			•		•		
Standard Infusion of Rats		•				•	
Blood Pressure Measurements, Rapid Infusions, IV Feeding	•			•			
Microdialysis with Rats							•
Specifications							
Inlet & Outlet Tube Gauge	20	22	25	20	22	22	22
Co-Ex External Tubing	-	<b>72-4426</b>	<b>72-6122</b>	-	<b>72-4426</b>	<b>72-4426</b>	<b>72-4426</b>
Intra-Vascular Polyurethane Tubing	-	<b>72-4429</b>	<b>72-6130</b>	-	<b>72-4429</b>	<b>72-4429</b>	<b>72-4429</b>
Poly Polyethylene Tubing	59-8330	-	-	59-8330	-	-	-
Center Channel ID	0.023 in	0.016 in	0.010 in	0.023 in	0.006 in	0.016 in	0.006 in
Center Channel Dead Volume	16 µl	8 µl	3 µl	18 µl	1.8 µl	1.8 µl	1.4 µl
Side Channel ID	-	-	-	0.023 in	0.006 in	0.016 in	0.016 in
Side Channel Dead Volume	-	-	-	18 µl	2.8 µl	18 µl	18 µl
Side (OD x L)	0.375 x 2.25 in	0.375 x 2.25 in	0.375 x 2.25 in	0.375 x 2.38 in	0.375 x 2.38 in	0.375 x 2.25 in	0.375 x 2.38 in
<b>Order # for Swivel</b>	<b>61-0000</b>	<b>61-0001</b>	<b>56-1324</b>	<b>61-0002</b>	<b>72-0000</b>	<b>61-0003</b>	<b>61-0004</b>



# DISPOSABLE SWIVELS BY HARVARD/INSTECH



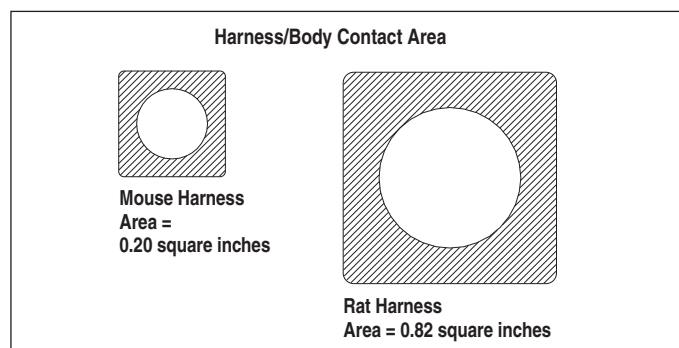
Precision Disposable Swivels			
Application	20 Gauge	22 Gauge	25 Gauge
Standard Infusion of Mice			•
Standard Infusion of Rats		•	
Blood Pressure Measurement, Rapid Infusions, IV Feeding	•		

## Specifications

	Blue	Purple	
Color	Pink	Blue	
Inlet and Outlet Tube Gauge	20	22	25
Compatible Tubing	PE90	PE50	PE20
Channel ID	0.023 in	0.016 in	0.010 in
Internal Dead Volume	12 µl	6 µl	2.5 µl
Size, Diameter x Length	0.375 x 1.69 in	0.375 x 1.69 in	0.375 x 1.69 in
<b>Order #</b>	<b>61-0011</b>	<b>61-0014</b>	<b>72-6121</b>
<b>Order # with Luer Inlet</b>	<b>72-4072</b>	<b>72-4074</b>	-

- 25 gauge swivel is ideal for mice
- Plastic Swivel-to-tether clamp included
- Single use, low cost, precision swivels
- Meets Harvard Apparatus' and Instech's strict quality standards
- Available in 3 sizes: 20 gauge, 22 gauge and 25 gauge

# INFUSION HARNESS BY HARVARD/INSTECH



- Non-surgical
- Less animal stress than normal jackets
- Proven effective on thousands of animals
- Promotes more rapid healing
- Harness grows with the animal

## Specifications

Clear Lumen	0.090 in	0.105 in	0.062 in
Body Surface Contact Area	0.82 sq in	0.82 sq in	0.20 sq in
Saddle Size	1.125 sq in	1.125 sq in	0.563 sq in
Spring	12 in	12 in	
Belly Band Length	Adjustable up to 22.9 cm (9 in)	Adjustable up to 22.9 cm (9 in)	Adjustable up to 11.4 cm (4.5 in)

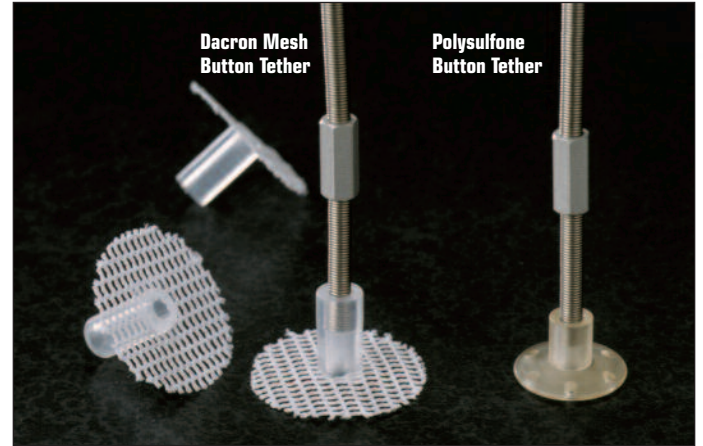
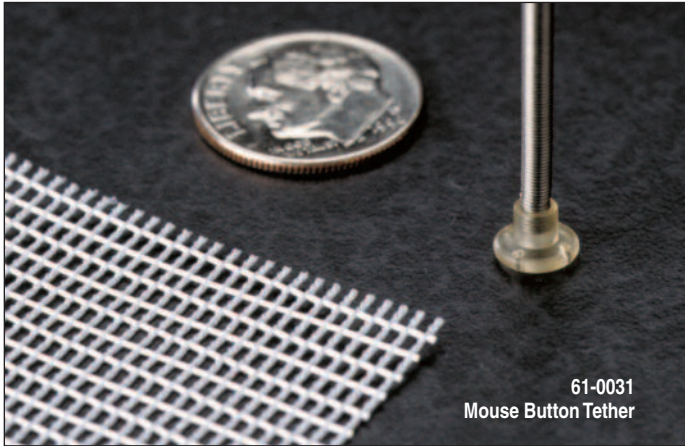
## System Weight

With Spring	12 g	12 g	3.0 g
Without Spring	5 g	5 g	0.7 g
<b>Order #</b>	<b>61-0041</b>	<b>61-0238</b>	<b>61-0269</b>



Infusion Harness			
Infusion	Rats	Rats	Mice
Single Channel	•		•
Dual Channel		•	

# BUTTON & HEAD BLOCK TETHERS BY HARVARD/INSTECH



- Small size which is ideal for mice
- Reduced animal stress for better research results
- Quick and easy tether attachment and removal

Button & Head Block Tethers					
Application	Polysulfone Button Tethers			Dacron Mesh Button Tethers	
Mouse Infusion	•				
Rat Infusion Single Channel		•		•	
Rat Infusion Dual Channel			•		•
Experiment Duration	1 to 30 days	1 to 10 days	1 to 10 days	10 to 60+ days	10 to 60+ days
<b>Specifications</b>					
Clear Lumen	0.062 in	0.090 in	0.105 in	0.090 in	0.105 in
Stainless Steel Spring	12 in	12 in	12 in	12 in	12 in
Button Diameter	0.25 in	0.625 in	0.625 in	1.0 in	1.0 in
System Weight	3.0 g	7.5 g	9.2 g	7.2 g	9.2 g
Parts Included:	Button, sterile spring, Dacron® mesh	Button, sterile spring, quick disconnect coupler	Button, sterile spring, quick disconnect coupler	Button, sterile spring, quick disconnect coupler	Button, sterile spring, quick disconnect coupler
<b>Order #</b>	<b>61-0031</b>	<b>59-8408</b>	<b>61-0027</b>	<b>72-6140</b>	<b>61-0034</b>

## GLASS IONOMER CEMENT



Order #	Product
72-9168	Glass Ionomer Cement Kit for Headblocks, supplied individually
72-9169	Replacement Glass Ionomer Cement Capsules, pkg. of 50

## MAGNETIC HEAD BLOCK TETHER BY HARVARD/INSTECH

- For rats and mice
- Easy-to-use
- Magnetic connection

Order #	Product
72-4476	Magnetic Head Block, Spring Tether, 1 base
72-4477	Magnetic Head Block, Looped Wire Tether, 1 base, slotted clamp
72-4478	Repl. Magnetic Head Block Bases, sterile, pkg. of 10
72-4479	Repl. Looped Wire Magnetic Tethers, non-sterile, pkg. of 5



# SPECIFICATIONS

Pumps	Pump 11 Elite	Pump 11 Pico Plus Elite
<b>Accuracy</b>	±0.5%	±0.35%
<b>Reproducibility</b>	±0.05%	±0.05%
<b>Syringes (Min./Max.)</b>	0.5 µl / 60 ml (10 ml dual)	0.5 µl / 10 ml
<b>Flow Rate:</b>		
<b>Minimum (0.5 µl syringe)</b>	1.28 pl/min	0.54 pl/min
<b>Maximum (10 ml syringe)</b>	25.99 ml/min	11.70 ml/min
<b>Maximum (60 ml syringe)</b>	88.28 ml/min	-
<b>Number of Microsteps per one rev. of Lead Screw</b>	15,360	20,480
<b>Step Resolution</b>	0.069 µm/µstep	0.031 µm/µstep
<b>Pusher Travel Rate:</b>		
<b>Minimum</b>	0.15 µm/min	0.02 µm/min
<b>Maximum</b>	159 mm/min	71.55 mm/min
<b>Non-Volatile Memory</b>	Stores all settings	
<b>Display</b>	4.3" WQVGA TFT color display with touch screen	
<b>Connectors:</b>		
<b>RS-485*</b>	IEEE-1394, 6 position	
<b>I/O &amp; TTL*</b>	15 pin D-Sub Connector	
<b>USB</b>	Type B	
<b>Footswitch</b>	Mini Phone Jack	
<b>Linear Force (Max.)</b>	16 kg (35 lbs) @ 100% force selection	
<b>Drive Motor</b>	0.9° stepper motor	
<b>Motor Drive Control</b>	Microprocessor with 1/16 microstepping	
<b>Step Rate:</b>		
<b>Minimum</b>	27.5 sec/µstep	
<b>Maximum</b>	26 µsec/µstep	
<b>Input Power</b>	12-30 VDC	
<b>Input Power Connection</b>	2.5 mm ID x 5.5 mm OD male plug	
<b>Power Supply</b>	100-240 VAC, 50/60 Hz, 8 watts universal power supply, use only a Harvard Apparatus approved power supply and line cord	
<b>Dimensions</b>	22.6 x 17.78 x 15 cm (9 x 7 x 6 in)	
<b>Weight</b>	2.1 kg (4.6 lbs)	
<b>Atmospheric Specifications:</b>		
<b>Operating Temperature</b>	4°C to 40°C (40°F to 104°F)	
<b>Storage Temperature</b>	-10°C to 70°C (14°F to 158°F)	
<b>Humidity</b>	20% to 80% RH, non condensing	
<b>Method of Operation</b>	Continuous	
<b>Classification</b>	Class I	
<b>Pollution Degree</b>	1	
<b>Installation Category</b>	II	
<b>Regulatory Certifications</b>	CE, ETL (UL, CSA), WEEE, EU RoHS & CB Scheme	

\*RS-485 and I/O & TTL are available on I/W Programmable Models only.

## Ordering Information

Order #	Product
70-4500	Pump 11 Elite Infusion Only Single Syringe
70-4501	Pump 11 Elite Infusion Only Dual Syringe
70-4504	Pump 11 Elite Infusion/Withdrawal Programmable Single Syringe
70-4505	Pump 11 Elite Infusion/Withdrawal Programmable Dual Syringe
70-4506	Pump 11 Pico Plus Elite Infusion/Withdrawal Programmable Dual Syringe

### Optional Accessories:

70-4000*	RS-485 Cable for Pump-to-Pump Communication, 0.5 m (2 ft)
70-4021*	RS-485 Cable for Pump-to-Pump Communication, 1 m (3 ft)
70-4001*	RS-485 Cable for Pump-to-Pump Communication, 2 m (7 ft)
70-4020*	RS-485 Cable for Pump-to-Pump Communication, 9 m (30 ft)
70-4002	USB Cable for PC-to-Pump Communication, 2 m (7 ft)
70-4003	USB Cable for PC-to-Pump Communication, 5 m (16 ft)
70-4005*	Adapter, Digital I/O
70-4006	Adapter, D-sub 15 to Term. Blk
70-2215	Footswitch (with Phono Plug)
55-7760	Cable Assy, Daisy-Chain, Legacy RS-232 RJ-11, 0.5 m (2 ft)
72-2478	Cable Assy, Daisy-Chain, Legacy RS-232 RJ-11, 2 m (7 ft)
55-8000	Adapter for 25ml and 50ml Hamilton GasTight™ Syringes



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