

Academic's #1 Choice of Syringe Pump, Enhanced for Glucose Clamp Studies!

Pump 11 Elite GC

Glucose Clamp Syringe Pump

Glucose Clamp Harvard Apparatus

Method Select GLUCOSE_CLAMP	Current Dose: 15 mg/kg/min 00:00:07 PRESS TO CLEAR MESSAGE
Syringe Select Hamilton, 100 ul, 1.457 mm	
Animal Weight 30 grams	
Concentration and Dose Rate 5 % 15 mg/kg/min	

Rate : 9 ul/min Time : 00:00:07
Total Volume Dispensed : 951.313 nl



Intuitive Touch Screen
with Glucose Clamp Software

Program Animal Weight, Concentration
and Dose Rate Without a PC

Ability to Change Dose Rate While Running

Previous Dose Rate Display
to Simplify Data Recording



a division of Harvard Bioscience, Inc.

www.harvardapparatus.com

Pump 11 Elite GC

Glucose Clamp Infusion System

Renowned syringe pump technology enhanced for academic euglycemic or hyperglycemic glucose clamp studies

The Pump 11 Elite Glucose Clamp Infusion System is a time saving syringe pump enhancement that offers quick and simple set-up using our innovative touch screen display. The built-in software capabilities reduce the potential for error in your research by providing the most accurate fluid delivery available.

- **Animal Weight, Concentration, and Dose Rate Programming**

Glucose clamp method allows for the user to enter a desired concentration, animal weight, and dose rate into the syringe pump. The Pump 11 Elite uses that information to properly set the infusion rate automatically.

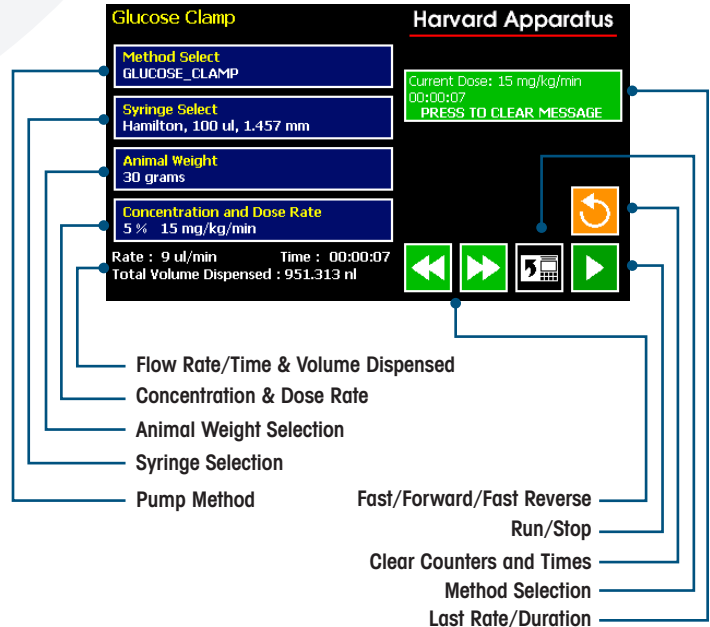
- **Change Dose Rate While Running**

In the Glucose Clamp method, the user has the ability to change the dose rate during infusion. This allows the execution of complex infusion procedures without the need to start and stop the process.

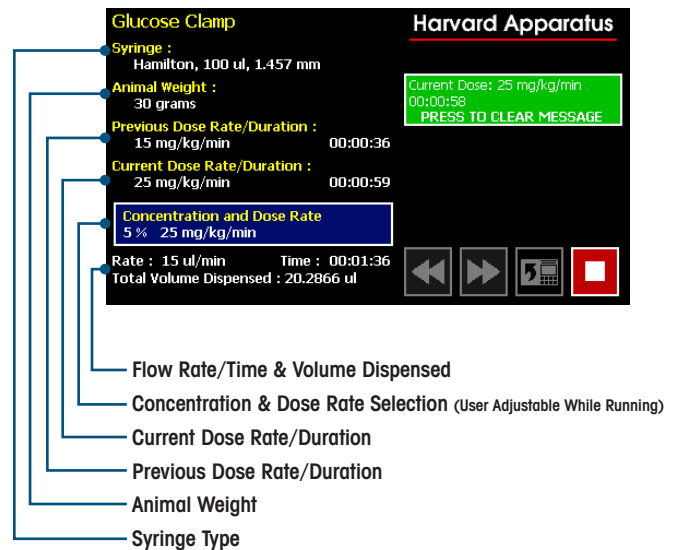
- **Previous Dose Rate Display**

The previous dose rate setting is displayed while the pump is running, which allows for easy monitoring. When the unit is stopped, the last dose rate set and its duration is clearly displayed.

Glucose Clamp Method: Main Setup Screen



Glucose Clamp Method: Main Run Screen



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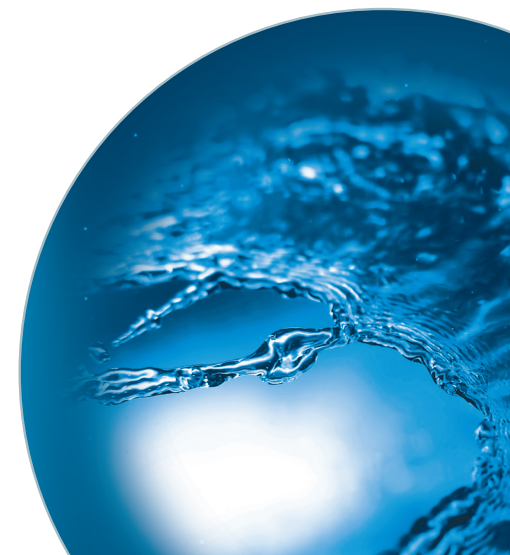
Harvard Apparatus offers a complete Glucose Clamp Infusion System for rats or mice including syringe pumps, swivels, tethers and catheters. Multiple syringe pumps push glucose, insulin and a drug, tracer glucose or other fluids into a 3 or 4-way connector which combines and reaches the animal via one channel

of a dual channel swivel. Blood samples are taken manually or with an automated sampler on the second channel. The two-channel VAH simplifies the animal connection and PinPorts can be used to simplify injections or intermittent sampling.

Syringe Pump Ordering Information	
Order #	Product
70-4504GC	Pump 11 Elite Infusion/Withdrawal Programmable Single Syringe Pump with Glucose Clamp Method
70-4505GC	Pump 11 Elite Infusion/Withdrawal Programmable Dual Syringe Pump with Glucose Clamp Method
70-4506GC	Pump 11 Pico Plus Elite Infusion/Withdrawal Programmable Dual Syringe Pump with Glucose Clamp Method
70-4507GC	Pump 11 Elite Nanomite Infusion/Withdrawal Programmable Single Syringe Pump with Glucose Clamp Method

Typical System for Rat Glucose Clamp Ordering Information	
Order #	Product
Various	Pump 11 Elite Syringe Pump with Glucose Clamp Method (see syringe pump chart)
61-0003	22 ga Dual Channel Swivel
72-4455	2-Channel VAHD Tether Assembly, 12 in, Sterile
72-4454	2-Channel Rat VAH Harness Injector, Sterile
75-0403	Catheter for Rat Jugular Vein, PU 3Fr, 3.0 cm
75-0404	Catheter for Rat Carotid Artery, PU 1.9-3 Fr, 16.5 cm
75-0220	PinPorts, 22 ga, with Injectors, Sterile
75-0214	Counter-Balanced Lever Arm, 6 in, with Holder for 4-Way Connector
75-0212	4-Way X Connector, 22 ga, Sterile

Typical System for Mouse Glucose Clamp Ordering Information	
Order #	Product
Various	Pump 11 Elite Syringe Pump with Glucose Clamp Method (see syringe pump chart)
75-0277	Low Torque Dual Channel Swivel, 22 ga OD, 25 ga ID
75-0289	2-Channel Mouse VAH Tether Assembly, 7 in, Sterile
75-0290	2-Channel Mouse VAH Harness, Injector, Sterile
75-0401	Catheter for Mouse Jugular Vein, PU 2 Fr, 10.0 cm
75-0402	Catheter for Mouse Carotid Artery, 1-3 Fr, 8 cm
75-0215	Counter-Balanced Lever Arm, 3.5 in, with Holder for 4-Way Connector
75-0213	4-Way X Connector, 25 ga, Sterile





Specifications	Pump 11 Elite	Pump 11 Pico Plus Elite	Pump 11 Elite Nanomite
Order #	70-4504GC, 70-4505GC	70-4506GC	70-4507GC
Type	Microprocessor single or dual syringe, infusion/withdrawal programmable	Microprocessor dual syringe, infusion/withdrawal programmable	Microprocessor single syringe, infusion/withdrawal programmable
Accuracy	±0.5%	±0.35%	±0.5%
Reproducibility	±0.05%	±0.05%	±0.05%
Syringe:	Plastic or glass		
Type	Plastic or glass		
Size (single syringe)	0.5 µl to 50/60 ml	-	0.5 µl to 1 ml
Size (dual syringe)	0.5 µl to 10 ml	0.5 µl to 10 ml	-
Flow Rate:			
Single Syringe	1.26 pl/min to 88.4 ml/min	-	3.66 pl/min to 3.82 ml/min
Dual Syringe	1.26 pl/min to 26.02 ml/min	0.54 pl/min to 11.70 ml/min	-
Display	4.3" WQVGA TFT color display with touch screen		
Connectors:			
RS-485	IEEE-1394, 6 position		
USB	Type B		
I/O & TTL	15-pin D-Sub Connector		
Footswitch	Mini Phono Jack		
Average Linear Force	16 kg (35 lbs) @ 100% Force Selection	16 kg (35 lbs) @ 100% Force Selection	5 kg (11 lbs) @ 100% force selection
Step Resolution	0.069 µm/µstep	0.031 µm/µstep	0.198 µm/µstep
Input Power	12-30 VDC		
Input Power Connection	2.5 mm ID x 5.5 mm OD male plug		
Power Supply	100-240 VAC, 50/60 Hz, 8 Watts Universal Power Supply, Use Only a Harvard Apparatus Approved Power Supply and Line Cord		
Dimensions, H x W x D	22.6 x 17.78 x 15 cm (9 x 7 x 6 in)	22.6 x 17.78 x 15 cm (9 x 7 x 6 in)	Control Box: 22.6 x 17.78 x 9.32 cm (9 x 7 x 3.67 in) Mechanism: 6.35 x 5.08 x 19.05 cm (2.5 x 2.0 x 7.5 in)
Weight	2.1 kg (4.6 lbs)	2.1 kg (4.6 lbs)	1.96 kg (4.32 lbs)
Regulatory Certifications	CE, ETL (UL, CSA), WEEE, EU RoHS & CB Scheme	CE, ETL (UL, CSA), WEEE, EU RoHS & CB Scheme	CE, EU RoHS

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