

# Pump Selection Guide

## 4. Syringe Pump Comparison Guide



Features & Specifications Harvard Syringe Pump Model	GENERAL PURPOSE SYRINGE PUMPS								SPECIALTY PUMPS			STANDARD PUMPING MODULES		
	Pump 11 Plus	Pump 11 Pico Plus	Pump 22	Pump 33	PHD 22/2000	PHD 22/2000 PUSH PULL	PHD 22/2000 Hpsi (4 syringe)	PHD 4400 Hpsi	Harvard 1	Pulsatile Blood Pump	10 Syringe Feeding Station	Microliter Flow	Milliliter Flow	High Pressure
<b>FLOW DIRECTION</b>														
Infusion Only	X		X		X		X	X	X	X				
Infuse or Withdraw (I/W)	Option	X	X	X	X		X	X		X		X	X	X
I/W with Independent Channel Control				X										
Push/Pull (Simultaneously I/W)				X		X								
<b>PRESSURE</b>														
Linear Force (Pounds)	16	25+	47	57	50	50	433	200	10	25	433	6	16	200
PSI Range (Syringe Dependent)	Refer to Pressure / Syringe Chart, see page A93													
<b>ADVANCED SELF-PROGRAMING</b>														
Gradient Mixing (2 Pumps)					X	X	X	X			X			
Multiple Dispense with External Trigger; By Volume; By Time					X	X	X	X						
Infuse/Withdraw In/Out of the Same Program					X	X	X	X						
Valve Control			X	X	X	X	X	X						
Foot & Timer Control			X	X	X	X	X	X						
Outputs to Scales And Printers					X	X	X	X						
<b>FLOW RATE RANGE</b>														
Minimum	0.0014 µl/hr	3.3333 pl/min	0.002 µl/hr	0.0004 µl/hr	0.0001 µl/hr	0.0001 µl/hr	1.5 µl/hr	0.0001 µl/hr	0.01 ml/hr	0.05 ml	1.5 µl/hr	0.0014 µl/hr	0.0014 µl/hr	0.0001 µl/hr
Maximum	26.56 ml/min	0.4394 ml/min	55.1 ml/min	106.6 ml/min	220.82 ml/min	220.82 ml/min	112 ml/min	220.82 ml/min	20 ml/min	100 ml	112 ml/min	0.854 ml/min	26.56 ml/min	220.82 ml/min
Accuracy %	±0.5	±0.5	±0.35	±0.35	±0.35	±0.35	±0.5	±0.35	±3.0	±2.0	±0.35	±0.5	±0.5	±0.5
Reproducibility %	±0.1	±0.1	±0.1	±0.1	±0.05	±0.05	±0.05	±0.05	±0.1	±0.5	±0.5	±0.1	±0.1	±0.1
End of Travel Switch	X	X		X					X			X		
Stall Detection			X	X	X	X	X	X	X		X		X	X
<b># SYRINGES IN HOLDER &amp; SIZE RANGE</b>														
Single Syringe Rack	0.5 µl to 60 ml	NA		0.5 µl to 140 ml				0.5 µl to 140 ml	1 ml to 60 ml			0.5 µl to 1.0 ml	0.5 µl to 60 ml	0.5 µl to 140 ml
Dual Syringe Rack	0.5 µl to 10 ml	0.5 µl to 10 ml	0.5 µl to 140 ml		0.5 µl to 140 ml	0.5 µl to 60 ml								
Microliter Syringe Rack, 4 Syringe			0.5 µl to 10 ml		0.5 µl to 10 ml									
6/10 Syringe Rack			0.5 µl to 60 ml		0.5 µl to 60 ml	0.5 µl to 60ml								
4 x 140 ml Syringe Rack Plastic Syringes			50 ml & 140 ml		50 ml & 140 ml									
Rack Can Hold HAI Stainless Steel Syringes			8 ml to 100 ml	8 ml to 100 ml	8 ml to 100 ml		20 ml to 200 ml	8 ml to 100 ml						
<b>OTHER FEATURES</b>														
Display	VFD	VFD	LED	LED	VFD	VFD	VFD	VFD	GRAPHIC	LED	VFD			
Rate Dispense	X	X	X	X	X	X	X	X	X		X			
Volume Dispense	X	X			X	X	X	X	X		X			
Anti-Syphoning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Computer Control-RS-232	Advanced Model Only	X	X	X	X	X	X	X			X			
TTL Control				X	X	X	X	X			X			
Remote Mechanical Unit (120 Feet)					X	X	X	X			X			
Occlusion Pressure Detect									X					
Battery Power Back-Up									X					
<b>WARRANTY</b>	2 Year	2 Year	2 Year	2 Year	2 Year	2 Year	2 Year	2 Year			2 Year	2 Year	2 Year	2 Year
<b>ORDERING INFORMATION</b>														
Base Price														
see page	A8	A9	A10	A11	A12 to A15	A12 to A15	A16	A18	A23	A37	A32	A33	A36	A34