Hamilton (HV) Plug Valves

- Wetted paths are chemically inert TEFLON[®] and Kel-F[®] materials
- Valves are for stand alone use or HVX and HVP valves can also be panel mounted
- Valve position is controlled manually via a handle attached to the valve stem
- Valve connections are via 1/4-28 UNF-2B (Unified Fine) fittings

Hamilton HV Plug Valves provide an economical and flexible method of custombuilding a fluid flow control system, from a simple on/off valve to a more complex multi-valve arrangement, using a combination of loop and distribution valves. The small valve body with its chemically inert flow path is ideally suited for low pressure applications. All HV Plug Valves allow you to select and interchange a wide variety of fittings, adapters and tubing, including male and female luers, FEP tubing assemblies, and adapters which thread directly into the valve providing an endless variety of valve configurations for any flow application. Hamilton (HV) fittings and adapters are installed finger-tight (10 ounce inches) and provide a leak-tight seal tested to 100 psig.

Three body styles of valves are available HV, HVP, and HVX.



The HV valve is physically the smallest valve and constitutes a basic unit for the control of fluids or gases. It is ideal for low pressure applications; from a basic on/off flow to a four-way distribution system.

The HVP valve is essentially the same as the HV valve except the HVP can be mounted into panels allowing for custom installation into control panels or instruments.

HVX valves are physically the largest valves. A larger port internal diameter allows increased fluid flows even with moderately viscous fluids. HVX valves can be used free standing or panel-mounted using an optional locking nut, **Part # 35121**. 6- and 8-port distribution and loop valves are available only in the HVX body style.

Hamilton Miniature Inert Valves

	HV	HVP	HVX
Valve Outer Body Dimension	3/4"	3/4"	1"
Port Orifice	.059"	.059"	.118"*
Panel Mounting	No	Yes	Yes
Panel Thickness	N/A	.150" (3.8 mm)	.625" (15.9 mm)

* The port orifice for 6-and 8-way distribution HVX valves is .059". The port orifice for 6-and 8-way loop HVX valves is .040".

Hamilton (HV) fittings and adapters are installed finger-tight (10 ounce inches) and provide a leak-tight seal tested to 100 psig.

Flow Valves



Flow valves are used to direct or redirect fluids. 2-, 3-, and 4 -port valves are available with straight through (180°), 90°, or "T" type plugs for seven different valves. All seven flow configurations are available as HV, HVP and HVX valves. The flow configuration drawings show the possible fluid flow paths for a three port flow valve with a "T" type plug.

Loop Valves



Loop valves are used to direct and redirect fluids. 4-, 6-, or 8- port valves are available with a loop type valve plug. The 4- port valve is available in HV, HVP and HVX body styles. The 6- and 8-port valves are only available in the HVX body style. The flow configuration drawings show the possible fluid flow paths for a 4-port valve with a loop type plug.

Distribution Valves



Distribution valves are used to direct fluid to a number of locations. 2-, 3-, 4-, 6- and 8-port valves are available with a distribution type valve plug. The 2-, 3-, and 4-port distribution valves are available in HV, HVP and HVX body styles. The 6- and 8-port valves are available only in the HVX body style. The flow configuration drawings show the possible fluid flow paths for a 4-port valve with a distribution type plug.

Hamilton (HV) Plug Valves

Hamilton (HV) Plug Valves

- Wetted paths are chemically inert TEFLON $^{\otimes}$ and Kel-F $^{\otimes}$ materials (100 psig or less)
- Valves are for stand alone use or HVX^\ddagger and HVP valves can also be panel mounted
- Valve position is controlled manually via a handle attached to the valve stem
- Valve connections are via 1/4-28 UNF-2B (Unified Fine) fittings; see page 88



Flow Diagram	Valve Description	Valve Model	HV	нур	HVX
	180° Flow Path 2-ports	1-1	86725	86775	86901*
	90° Flow Path 2-ports	2-2	86726	86776	86902*
	"T" Flow Path 3-ports	3-3	86727	86777	86903*
	90° Flow Path 3-ports	3-2	86728	86778	86904*
	Loop Flow Path 4-ports	4-4	86729	86779	86905*
	"T" Flow Path 4-ports	4-3	86730	86780	86906*
	90° Flow Path 4-ports	4-2	86731	86781	86907*
	180° Flow Path 4-ports	4-1	86732	86782	86908*

Hamilton (HV) Plug Valves

Valve Connections: Use only HV fittings and adapters for leak-free connections to Hamilton valves



Flow Diagram	Valve Description	Valve Model	HV	HVP	HVX
	Distribution Flow Path 2-ports	1-5	86735	86785	86910*
	Distribution Flow Path 2-ports	2-5	86736	86786	86911*
	Distribution Flow Path 3-ports	3-5	86737	86787	86912*
	Distribution Flow Path 4-ports	4-5	86738	86788	86913*
	Distribution Flow Path 6-ports	6-5			86915
	Loop Flow Path 6-ports	6-6			86916**
	Distribution Flow Path 8-ports	8-5			86918
	Loop Flow Path 8-ports	8-7			86919**

Note: All valves have .059"/1.5 mm diameter ports unless otherwise specified. * Valve has .118"/3 mm diameter ports. ** Valve has .040"/1 mm diameter ports.

VALVES & FITTINGS

Hamilton (HV) Plug Valve Replacement Parts and Specifications

HV, HVP Flow Valve



HVX Distribution Valve



HV Valve Replacement Parts

Model	HV	HVP	HVX
1. Handle/Decal			
180° Flow Path	35044*	35044*	30810/30836
90° Flow Path	35045*	35045*	30810/30837
"T" Flow Path	35046*	35046*	30810/30838
4-port Loop Flow Path	35047*	35047*	30810/30839
4-port Distribution Flow Path	35048*	35048*	30810/30840
6-, 8-port Distribution Flow Path			30810/30840
6-port Loop Flow Path			30810/35131
8-port Loop Flow Path			30810/35132
2. Set Screw	16535	16535	16466
3. Cap Bushing	35004	35005	35113
4. Upper Stem Washer	17874	17874	35114
5. Driver Stem	35006	35007	35111
6. Compression Spring	1676-01	1676-01	1678-01
7. Cap	35008	35009	35112
8. Valve Plug			
180°	35050	35050	35150
90°	35051	35051	35151
"T"	35052	35052	35152
4-port Loop	35001	35001	35110
4-port Distribution	35053	35053	35153
6-, 8-port Distribution			35154
6-port Loop			35129
8-port Loop			35130
9. Lower stem washer	35019	35019	
Panel mount nut		16450	35121
Hex wrench	16476	16476	16477
* Decal not needed for these handles			

HV Valve Specifications

	HV	HVP	HVX
Dimensions	3/4" Square	3/4" Square	1" Square
Temperature Range, °C (°F)	10 - 100 (50 - 212)	10 -100 (50 -212)	10 - 100 (50 - 212)
Weight, Ounces	2	2	2
Maximum Pressure Rating, psig	0-100	0-100	0-100
Valve Connection Ports	1/4-28	1/4-28	1/4-28
Break Away Torque, Ounce Inches	10-15	10-15	60
Maximum Panel Thickness		.150"	.625"
Panel Hole Diameter		.438"	.750"
1. Handle	Nickel	Nickel	Black Nylon
2. Set Screw	Stainless Steel	Stainless Steel	Stainless Steel
3. Cap Bushing	Nylon	Nylon	TEFLON ®
4. Upper Stem Washer	Stainless Steel	Stainless Steel	Stainless Steel
5. Drive Stem	Stainless Steel	Stainless Steel	Stainless Steel
6. Compression Spring	Zinc Plated Wire	Zinc Plated Wire	Stainless Steel
7. Cap	Aluminum	Aluminum	Aluminum
8. Valve Plug	PTFE*	PTFE*	PTFE*
0-Ring	Buna-N	Buna-N	Viton
Valve Plug Seat	CTFE**	CTFE**	CTFE**
Valve Housing	Aluminum	Aluminum	Aluminum
Lower Stem Washer	Stainless Steel	Stainless Steel	

* PTFE (polytetrafluoroethylene) ** CTFE (chlorotrifluoroethylene)

Description	HV	HVP	нух	Model	Port I.D. In./mm	1. Port Vol. µL	2. Plug Vol. µL	3. Dist. Port Vol. µL	4. Total Vol. μL
180° Flow Path	86725	86775		1-1	.059/1.5	2.51	8.98		14.00
2-ports			86901	1-1	.118/3.0	11.13	71.82		94.08
90° Flow Path	86726	86776		2-2	.059/1.5	2.51	8.98		14.00
2-ports			86902	2-2	.118/3.0	11.13	71.82		94.08
"T" Flow Path	86727	86777		3-3	.059/1.5	2.51	13.47		21.00
3-ports			86903	3-3	.118/3.0	11.13	107.73		141.12
90° Flow Path	86728	86778		3-2	.059/1.5	2.51	8.98		16.52
3-ports			86904	3-2	.118/3.0	11.13	71.82		105.21
Loop Flow Path	86729	86779		4-4	.059/1.5	2.51	8.98		14.00
4-ports			86905	4-4	.118/3.0	11.13	44.80		67.06
"T" Flow Path	86730	86780		4-3	.059/1.5	2.51	13.47		23.52
4-ports			86906	4-3	.118/3.0	11.13	107.73		152.25
90° Flow Path	86731	86781		4-2	.059/1.5	2.51	8.98		19.03
4-ports			86907	4-2	.118/3.0	11.13	71.82		116.34
180° Flow Path	86732	86782		4-1	.059/1.5	2.51	8.98		19.03
4-ports			86908	4-1	.118/3.0	11.13	71.82		116.34
Distribution Flow	86735	86785		1-5	.059/1.5	2.51	9.74	4.58	16.83
Path 2-ports			86910	1-5	.118/3.0	11.13	75.41	22.26	108.80
Distribution Flow	86736	86786		2-5	.059/1.5	2.51	9.74	4.58	16.83
Path 2-ports			86911	2-5	.118/3.0	11.13	75.41	22.26	108.80
Distribution Flow	86737	86787		3-5	.059/1.5	2.51	9.74	4.58	16.83
Path 3-ports			86912	3-5	.118/3.0	11.13	75.41	22.26	108.80
Distribution Flow	86738	86788		4-5	.059/1.5	2.51	9.74	4.58	16.83
Path 4-ports			86913	4-5	.118/3.0	11.13	75.41	22.26	108.80
Distribution Flow Path 6-ports			86915	6-5	.059/1.5	2.78	18.85	5.57	27.20
Loop Flow Path 6-ports			86916	6-6	.040/1.0	1.24	5.00		7.47
Distribution Flow Path 8-ports			86918	8-5	.059/1.5	2.78	18.85	5.57	27.20
Loop Flow Path 8-ports			86919	8-7	.040/1.0	1.24	4.00		6.47

Hamilton (HV) Plug Valve Volume

Valve volume is listed four different ways in the chart below:

- 1. Port Volume This is the volume of a single port and does not include the valve plug
- 2. Plug Volume This is the volume of the valve plug only and does not include the valve port volume
- 3. Distribution Port Volume This is the volume of the bottom port on distribution valves
- 4. Total Volume This is the total volume of one flow path through the valve

Flow Valves - valve volume equals two port volumes (or three for "T" valves) plus plug volume

Flow Path

Loop Valves - valve volume equals two port volumes plus one valve path plug volume



Distribution Valves - valve volume equals one port volume, one distribution port volume plus the plug volume



Side View

HV Fittings, Adapters and Tubing

- Use with Hamilton valves; see pages 84, 85
- · Use tubing assemblies to connect tubing to valves (100 psig or less)
- Use the female luer, male luer, luer lock and barbed fittings to connect syringes, equipment, or other devices to Hamilton valves

Ordering Information

ordering mormation	1/4-28		M6		
Valve Fittings	Thr	eads	Threads [‡]		
Port Diameter	.059"/ 1.5 mm	.118"/ 3.0 mm	.059"/ 1.5 mm	.118"/ 3.0 mm	
Female Luer	35031	35071			
Male Luer	35030	35070			
Male Luer Lock**	35033	35073			
1/8" Barb	35032*	35072			
Plug	32802 88802	1/pk 10/pk	32852 88852	1/pk 10/pk	
Union	32800 88800	1/pk 10/pk	88850	10/pk	
Swivel Union**	350	037			
Swivel 90° Union**/Tube Fitting	350	036			

‡ M6 threads are for general lab use only.

Needle Bushings and Needles

	Bushing for "RN" type Needles	35035	
	Bushing for "Hat" type Needles	35056	
7	Needles Stainless Steel "Hat" type Needle gauge/length/ point style (x/2"/3), 3/pk, Use with bushing #35056	90814 14 ga. 90816 16 ga. 90818 18 ga. 90820 20 ga. 90822 22 ga. 90824 24 ga. 90826 26 ga.	90815 15 ga. 90817 17 ga. 90819 19 ga. 90821 21 ga. 90823 23 ga. 90825 25 ga.

- Fittings and adapters are Kel-F® (CTFE) unless otherwise noted
- Some fittings, e.g. female luer, male luer, luer lock and barbed fittings, are offered in two port diameters, namely .059" and .118", for fluid flow optimization
- Hamilton (HV) fittings and adapters are installed finger tight (10 ounce inches) and provide a leak tight seal rated to 100 psig.

Assembled 1/4-28 Male Tube Fittings with Flared TEFLON® FEP Tubing

One Hub Assembled with 24" of Tubing	88986 88987 88988	(22 gauge) (18 gauge) (12 gauge)
Two Hubs Assembled with 12" of Tubing	88916 88917 88918	(22 gauge) (18 gauge) (12 gauge)

1/4-28 Tube Fittings and Washers (no tubing)

Fittings and Washers	88842 88843	(22/18 guage) 5/pk (12 gauge) 5/pk
Fittings	32842 32843	(22/18 guage) 1/pk (12 gauge) 1/pk
Washers ———	32882 88882 32883 88883	(22/18 guage) 1/pk (22/18 guage) 10/pk (12 gauge) 1/pk (12 gauge) 10/pk

TEFLON® FEP Tubing*

22 gauge (.0/4" 0.D028" 1.D. nominal)	88906 10'/pk 20939 over 10' (specify length)
18 gauge (.074" O.D042" I.D. nominal)	88907 10'/pk 20937 over 10' (specify length)
12 gauge (.117" O.D085" I.D. nominal)	88908 10'/pk 20938 over 10' (specify length)
Flanging Tool Kit 120V Flanging Tool Flanging Tips (3) Flanging Tips (3)	88821 Includes 1 each of the following: Flanging Tool 120V 32909 Flanging Tip 22 ga. 32905 Flanging Tip 18 ga. 32906 Flanging Tip 12 ga. 32907 Tubing Holder 32903

Unless otherwise specified, products are sold 1/pk * Fittings must be added and tubing flared using the Flanging Tool Kit. Reference Drawings (Not to Scale)

Valve Connections: Use only HV fittings and adapters for leak-free connections to Hamilton valves

General Laboratory Fittings, Adapters and Tubing (Industry Standard)

- Use for assembly of low pressure (100 psig or less) gas or fluid flow systems (not recommended for direct connection to Hamilton valves)
- Fittings and adapters are Kel-F® (CTFE) unless otherwise noted

Ordering Information

Valve Fittings	1/4-28 Threads	M6 Threads
Female Luer	32834	32874
Female Luer/ Female Luer Connector	86505	
Female Luer/ Male Luer Lock Connector**	86513	
Female Luer/ Threaded Connector	86540 (8-32 UNC) [†] 86541 (10-24 UNC) 86542 (1/4-20 UNC) 86543 (5/16-18 UNC)	
Female Luer Cap	16801	
Female M6/Male 1/4-28 or Female 1/4-28/Male M6	(F) M6/(M) 1/4-28 32821	(F) 1/4-28/(M) M6 32870 (1/32" bore) 32871 (1/16" bore)
Male Luer	32835	32875 35074 (.118" bore)
Male Luer/Male Luer	86506	
Male Luer/Female Luer	86507	
Male Luer Lock**	32836	32876
Male Luer Lock/Male Luer**	86512	
Male Luer Lock/Male Luer Lock**	86511	
Male Luer Lock/ Threaded Connector**	86530 (8-32 UNC) 86531 (10-24 UNC) 86533 (1/4-20 UNC) 86534 (5/16-18 UNC) 86536 (1/8-NPT) ^{††} 86537 (1/4-NPT)	
Pipe Connector/Male 1/4-28	32822 (1/8-NPT) 32823 (1/4-NPT)	

† UNC (United National Course) †† NPT (National Pipe Thread) * LW = Light Wall, HW = Heavy Wall ** Fitting Kel-F and Metal Reference Drawings (Not to Scale)

- The port diameters of adapters and connectors are .059" (unless otherwise specified)
- Hamilton (HV) fittings and adapters are installed finger-tight (10 ounce inches) and provide a leak tight seal rated to 100 psig.

Valve Fittings	1/4-28 Threads	M6 Threads	
Fittings and Washers	88806 (22/18 ga.) 10/pk 88807 (12 ga.) 10/pk	88856 (1/16" 0.D.) 10/pk 88857 (1/8" 0.D.) 10/pk 32856 (1/16" 0.D.) 1/pk 32857 (1/8" 0.D.) 1/pk	
Fittings	32806 (22/18 ga.) 1/pk 32807 (12 ga.) 1/pk		FC &
Washers +}	32882 (22/18 ga.) 1/pk 88882 (22/18 ga.) 10pk 32883 (12 ga.) 1/pk 88883 (12 ga.) 10/pk	249922 (22/18 ga.) 1/pk 249924 (12 ga.) 1/pk	VI V

Assembled Male Tube Fittings with 12" Flared FEP Tubing

Two Hubs, IS/HV thread	88956 (22 ga.) 88957 (18 ga.) 88958 (12 ga.)	
Two Hubs, IS/IS thread*	88946 (22 ga.) 88947 (18 ga.) 88948 (12 ga.)	889501W 1/16" 0.D042".LD.* 88952HW 1/16" 0.D. 1/32".LD.* 88960LW 1/8"0.D095".LD.* 88962HW 1/8"0.D. 1/16".LD.*

* 25 inch length

Stainless Steel Tube Adapters 1/4

-28 Male/Tube	32803 (1/4"0.D. Tube)	
	32804 (1/8"0.D. Tube) 32805 (1/16"0.D. Tube)**	32855 (1/16"0.D. Tube)

3 and 4 Way Male Luer Connectors

3 Way "T"		
	86516	
4 Way "X"		
	86518	

3 and 4 Way Threaded Junctions

Reference Drawings (Not to Scale).

Valve Connections: Use only HV fittings and adapters for leak-free connections to Hamilton valves.

VALVES **TTINGS** & FI

Modular Valve Positioner (MVP)

- · Bi-directional valve movement and control
- Versatile serial (RS-232) or digital (TTL) communication
- Easy, "snap-in, snap-out" valve replacement automates any of 16 different Hamilton valve configurations
- · Wetted paths are chemically inert TEFLON® and Kel-F® materials

Selection. Choose the MVP which best meets your needs.

To order:

- 1. Select an MVP, with or without cover, and with the communication method of your choice from this page.
- 2. Select the necessary power supply and power cord configuration for your needs from this page.
- 3. Choose the valve which provides the appropriate flow configuration from page 91.
- 4. Your MVP is ready to use. [Note: TEFLON tubing assemblies appear on page 88.]



Example: 1. Serial MVP with cover, Part # 36798

- 2. 90-260VAC power supply, Part # 6500028 and North American power cord Part # 6541000
- 3. 4-port distribution valve, Part # 36719
- 4. Serial MVP with cover, 90-260VAC power supply, North American power cord, and 4-port distribution valve



Communication Methods	MVP With Cover	Serial (RS-232) MVP Without Cover	Digital (TTL) MVP Without Cover
Serial (RS-232) Protocol 1/RNO+	36798	0159698	
Serial (RS-232) DIN Protocol/BDZ+	36790	0159699	
Digital (TTL)	36789		0159220

Power Supplies

Power Cords	115VAC Part # 6500025	220VAC Part # 6500026	90-260VAC Part # 6500028
115V (North American)	Supplied with power cord		6541000
220V (Schuko)		6541005	6541005

& FITTINGS VALVES

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MVP Valve Configurations

- Easy "snap-in, snap-out" valve replacement
- Wetted paths are chemically inert TEFLON® and Kel-F[®] materials (100 psig or less)
- Valve connections are 1/4-28 UNF-2B female fittings

Valve Connections: Use only HV fittings, adapters and tube assemblies

for leak-free connections to Hamilton valves.

Flow Diagram	Valve Description	Valve Model	HVM	HVXM
	180° Flow Path 2-ports	1-1	36650	36723*
	90° Flow Path 2-ports	2-2	36651	36724*
	"T" Flow Path 3-ports	3-3	36652	36799*
	90° Flow Path 3-ports	3-2	36653	36756*
-	Loop Flow Path 4-ports	4-4	36654	36757*
-	"T" Flow Path 4-ports	4-3	36718	36779*
	90° Flow Path 4-ports	4-2	36717	36780*
**	180° Flow Path 4-ports	4-1	36655	36796*

Note: All valves have .059"/1.5 mm diameter ports unless otherwise indicated. * Valve has .118"/3 mm diameter ports. ** Valve has .040"/1 mm diameter ports.

Flow Diagram	Valve Description	Valve Model	HVM	HVXM
	Distribution Flow Path 2-ports	1-5	36657	36714*
	Distribution Flow Path 2-ports	2-5	36658	36722*
	Distribution Flow Path 3-ports	3-5	36659	36758*
	Distribution Flow Path 4-ports	4-5	36719	36759*
	Distribution Flow Path 6-ports	6-5		36760
	Loop Flow Path 6-ports	6-6		36781**
6	Distribution Flow Path 6-ports	8-5		36766
	Loop Flow Path 8-ports	8-7		36782**

For valve housings constructed of alternative materials, such as Kel-F[®], PEEK, or stainless steel, contact Hamilton Company.

Two Position Valve Switcher

- Electrically operated, 120VAC
- Provides automation of Hamilton two position plug valves (HV, HVX and HVXL)
- Valve is actuated by your choice of voltages (12VAC or DC @ 100 ma, 24VAC or DC @ 50 ma, 120VAC @ 10 ma or switch closure)
- Supplied with specified valve



Two Position Valve Positioner

Required Signal Voltage	AC Signal Actuated Valve Switcher Part #	DC Signal Actuated Valve Switcher Part #	Compatible Valve Models*	Required Signal Voltage	AC Signal Actuated Valve Switcher Part #	DC Signal Actuated Valve Switcher Part #	Compatible Valve Models*
12V @ 100 ma	0138962 0147662 0147762 0147862	0138912 0147612 0147712 0147812	HV HVX HVXL6-6 HVXL8-7	120V @ 10 ma	0138980 0147680 0147780 0147880	Not Available	HV HVX HVXL6-6 HVXL8-7
24V @ 50 ma	0138974 0147674 0147774 0147874	0138924 0147624 0147724 0147824	HV HVX HVXL6-6 HVXL8-7	Switch Closure	0138900 0147600 0147700 0147800	Not Available	HV HVX HVXL6-6 HVXL8-7

Note: All Valve Switchers must be connected to 120VAC, 60Hz line voltage. * Select the valve you need from the chart below.

Valves for Use With the Two Position Valve Switcher

- Each Valve Switcher is supplied with a valve installed
- Select the valve you need from the chart below

Valve Porting	g and Position				
Valve Position with Signal Voltage OFF	Valve Position with Signal Voltage ON	Valve Model	HV	нух	HVXL
	-①-	1-1	86725	86901	
		3-2	86728	86904	
•	-••-	4-4	86729	86905	
		6-6			86916
		8-7			86919