

Standard Design Table for HVT-PI (3"-24") Line Sizes

At Differential Pressure = 100" of water

Line Size in inches	Beta Ratio	Throat Diameter	Laying Length	D _{RC}	Water Flow at 60 °F		R _D (10 ⁻³)	With HL
					MGD	GPM		
3.00	A 0.5000	1.50	0.75	2.20	0.1855	128.78	121	12.1
	B 0.6000	1.80	0.75	2.40	0.2728	189.45	178	10.0
	C 0.7000	2.10	0.75	2.60	0.3841	266.75	251	7.1
4.00	A 0.5250	2.10	0.75	3.00	0.3653	253.65	179	10.9
	B 0.6000	2.40	0.75	3.20	0.4856	337.23	238	9.5
	C 0.7000	2.80	0.75	3.50	0.6850	475.70	336	6.7
5.00	A 0.4800	2.40	0.75	3.70	0.4740	329.19	186	11.2
	B 0.6000	3.00	0.75	4.00	0.7611	528.56	298	9.0
	C 0.7000	3.50	0.75	4.30	1.0789	749.25	423	6.4
6.00	A 0.5000	3.00	0.75	4.50	0.7418	515.14	242	10.5
	B 0.5833	3.50	0.75	4.80	1.0270	713.20	335	9.0
	C 0.7000	4.20	0.75	5.20	1.5365	1067.00	502	6.1
8.00	A 0.5250	4.20	0.75	6.10	1.4610	1014.61	358	9.5
	B 0.6000	4.80	0.75	6.50	1.9424	1348.91	476	8.2
	C 0.7000	5.60	0.75	7.00	2.7400	1902.80	671	5.8
10.00	A 0.4800	4.80	0.75	7.40	1.8936	1315.00	371	9.8
	B 0.6000	6.00	0.75	8.10	3.0328	2106.15	594	7.9
	C 0.7000	7.00	0.75	8.70	4.2735	2967.71	837	5.5
12.00	A 0.5000	6.00	0.75	9.00	2.9712	2063.30	485	9.2
	B 0.5833	7.00	0.75	9.70	4.1199	2861.05	673	7.9
	C 0.7000	8.40	0.75	10.50	6.1994	4305.15	1012	5.3
14.00	A 0.5000	7.00	0.75	10.50	4.0304	2798.91	564	8.9
	B 0.6000	8.40	0.75	11.40	5.9117	4105.33	827	7.4
	C 0.7000	9.80	0.75	12.20	8.2502	5729.30	1155	5.2
16.00	A 0.5250	8.40	0.75	12.30	5.8346	4051.80	715	8.0
	B 0.6125	9.80	0.75	13.20	8.0959	5622.16	992	6.5
	C 0.7000	11.20	0.75	14.00	10.8803	7555.74	1333	4.4
18.00	A 0.5000	9.00	0.75	13.60	6.6742	4634.84	727	8.2
	B 0.6222	11.20	0.75	15.00	10.6199	7374.93	1156	6.2
	C 0.7000	12.60	0.75	15.80	13.7986	9582.35	1502	4.4
20.00	A 0.4900	9.80	0.75	15.00	7.8914	5480.14	773	8.1
	B 0.6300	12.60	0.75	16.80	13.4098	9312.39	1314	5.9
	C 0.7000	14.00	0.75	17.60	16.8738	11717.92	1653	4.2

Calculations for a Given HVT-PI for Water at 60°F

$$h_{wA} = 100 (Q_A/Q)^2$$

$$Q_A = Q \sqrt{h_{wA}/100}$$

$$HL_A = HL (Q_A/Q)^{1.88}$$

Example:

For a 48" C HVT-PI, find:

- h_{wA} at 200 MGD
- HL_A at 200 MGD
- Q_A at h_{wA} = 500"

Solution:

- h_{wA} = 100 (200/99.0639)²
= 407.60"
- HL_A = 3.6 (200/99.0639)^{1.88}
= 13.5"
- Q_A = 99.0639 √(500/100)
= 221.51 MGD

Symbols

- D = Inlet diameter, inches
- d = Throat diameter, inches
- Beta = β = d/D
- LL = Meter laying length, inches
- D_{RC} = Meter outlet diameter, inches
(Watch for butterfly valve interference)
- h_w = Differential pressure, inches of water at 68 °F, 14.7 PSIA
- HL = Headloss, inches of water at 68 °F, 14.7 PSIA, values as tabulated
- Q = Flow rates as tabulated in MGD and GPM
- Subscript A = Indicates any differential pressure (h_{wA}) or any headloss (HL_A) when any flow rate (Q_A) passes through a given HVT

Notes

- Flow in throat must not cavitate!
- For standard accuracy, R_D must be greater than 75 000.
- Design information in the standard design tables can be used for HVTs which have the same geometry but are made of other materials.

Standard Design Table for HVT-PI (24"-96") Line Sizes

At Differential Pressure = 100" of water .

Line Size in inches	Beta Ratio	Throat Diameter	Laying Length	D _{RC}	Water Flow at 60 °F			With R _D (10 ⁻³)	HL
					MGD	GPM	R _D (10 ⁻³)		
24.00	A 0.5250	12.60	0.75	18.50	13.1198	9110.94	1071	7.4	
	B 0.5833	14.00	0.75	19.40	16.3861	11379.25	1338	6.6	
	C 0.7000	16.80	0.75	21.10	24.3670	16921.52	1990	4.0	
30.00	A 0.5000	15.00	1.25	22.70	18.5337	12870.60	1211	7.4	
	B 0.6000	18.00	1.25	24.60	27.2418	18917.91	1779	6.0	
	C 0.7000	21.00	1.25	26.30	38.2551	26566.02	2499	3.9	
36.00	A 0.5000	18.00	1.25	27.20	26.7049	18545.04	1454	7.1	
	B 0.5833	21.00	1.25	29.10	36.9721	25675.07	2013	6.0	
	C 0.7000	25.20	1.25	31.60	55.3132	38411.96	3011	3.8	
42.00	A 0.5000	21.00	1.25	31.70	36.3706	25257.34	1697	7.0	
	B 0.6000	25.20	1.25	34.40	53.5606	37194.84	2499	5.6	
	C 0.7000	29.40	1.25	36.90	75.6192	52513.34	3528	3.8	
48.00	A 0.5250	25.20	1.25	37.00	52.6407	36556.07	2149	6.4	
	B 0.6125	29.40	1.25	39.70	73.2741	50884.79	2991	5.3	
	C 0.7000	33.60	1.25	42.10	99.0639	68794.36	4044	3.6	
54.00	A 0.5000	27.00	1.25	40.80	60.1719	41786.07	2184	6.7	
	B 0.6000	32.40	1.25	44.20	88.7225	61612.88	3220	5.4	
	C 0.7000	37.80	1.25	47.40	125.6453	87253.65	4560	3.5	
60.00	A 0.5000	30.00	1.25	45.30	74.2484	51561.40	2425	6.5	
	B 0.6000	36.00	1.25	49.10	109.3753	75955.07	3572	5.3	
	C 0.7000	42.00	1.25	52.70	154.5726	107342.10	5048	3.5	
66.00	A 0.5000	33.00	1.50	49.80	89.8314	62382.92	2667	6.4	
	B 0.6000	39.60	1.50	54.00	132.3167	91886.58	3929	5.2	
	C 0.7000	46.20	1.50	57.90	186.9330	129814.55	5550	3.4	
72.00	A 0.5000	36.00	1.50	54.40	106.8959	74233.25	2909	6.3	
	B 0.6000	43.20	1.50	59.00	157.4515	109341.29	4285	5.1	
	C 0.7000	50.40	1.50	63.30	222.3706	154424.00	6052	3.3	
84.00	A 0.5000	42.00	1.50	63.40	145.3931	100967.42	3392	6.1	
	B 0.6000	50.40	1.50	68.80	213.8867	148532.45	4990	4.8	
	C 0.7000	58.80	1.50	73.80	301.1497	209131.76	7025	3.2	
96.00	A 0.5000	48.00	1.50	72.50	190.0177	131956.73	3879	5.9	
	B 0.6000	57.60	1.50	78.60	279.7686	194283.73	5711	4.8	
	C 0.7000	67.20	1.50	84.30	394.8604	274208.60	8060	3.2	

- 1 Fiberglass Reinforced Plastic
- 2 Stainless steel, or as specified
- 3 Carbon steel (or as specified)
Center flange fits inside of bolt circle for 125 PSI flange, or as specified

• High and Low Pressure Taps: Up to D = 24": 1/4" NPT D = 30" and greater: 1/2 NPT

* Approximate dimensions for clearance purposes.

For actual dimensions, call PFS.

