

Cast Iron Variable Orifice Static Balancing Valve

Feature

- Cast iron variable orifice double regulating globe valve
- Precision adjustable handwheel
- Multi-turn adjustment (five full turns minimum)
- Positive shut-off with memory stop
- Indicator of regulating position on the handwheel
- Flat face flange ends to ANSI B16.10
- Flanges drilled according to ASME B16.1 class 125
- Lengths according to EN558-1 series 1
- Alkyd/acrylic painted surface
- Valve accuracy $\pm 5\%$ to nominal Cv value at fully open position
- Threaded and capped test ports
- PT ports included with valves (not mounted)
- Meet BAA requirement

Class 125

Working conditions:

- Water: from 15°F to 260°F
- below 32°F only for water with added antifreezing fluids
- over 212°F only for water with added anti-boiling fluids



Material

	Part	Material	Specification
1	Body	Cast iron	ASTM A48 class 35B
2	Cone screw ¹	Steel	A2
3	Balancing cone	Composite material	-
4	Gasket disc	EPDM	-
5	Shutter	Composite material	-
6	Shut./bon. O-ring	EPDM	-
7	Body/bon. O-ring	EPDM	-
8	Bonnet ²	Cast iron	ASTM A48 class 35B
9	O-ring ¹	EPDM	-
10	Screws	Carbon steel	8.8 A2A
11	Washer ¹	DZR Brass	C35330
12	Memory stop	DZR Brass	C35330
13	Mem. stop O-ring	EPDM Perox	-
14	Stem	DZR Brass	C35330
15	Stem O-ring ¹	EPDM	-
16	Screw ¹	Brass ³	C27200
17	Bushing	DZR Brass ⁴	C35330
18	Handwheel	Polymide ⁵	PA6.6
19	Screw	Brass ⁶	C27200
20	Plug 1/4"	Steel ⁷	AISI 1035
21	Test point	DZR Brass ⁸	C35330

¹ Not on 2"

² Screw bonnet in CW602N on 2"

Two-piece bonnet (screwed) with EPDM gasket on 2 1/2"

Two-piece bonnet with bottom part in ductile iron ASTM A536 80-55-06
8.8 A2A steel joint screws on size $\geq 8"$

³ X5CrNi18-10 steel on $\geq 8"$

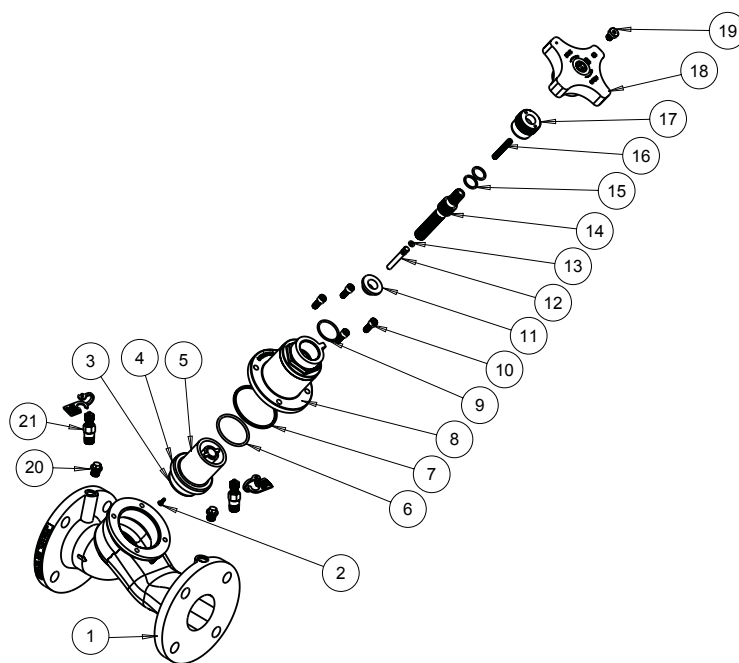
⁴ CuZn40Pb2 brass screw and washer on size $\geq 8"$

⁵ Copper nut and steel ring on 2"

⁶ 5 A2A steel on size $\geq 8"$

⁷ Caps with carbamide rubber gaskets

⁸ Test points with EPDM gaskets and polypropylene ties



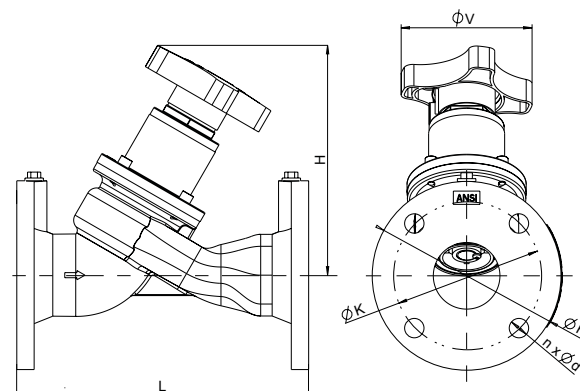
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Dimension, Weight, Flow range

Size	ΦF [in]	ΦK [in]	NxΦD [in]	L [in]	H [in]	ΦV [in]	Weight [lb]	Flow range ¹ [GPM]
2"	6.0	4.75	4x0.75	9.1	5.1	2.9	18.3	24.1-55.6
2½"	7.0	5.50	4x0.75	11.4	8.7	5.1	32.0	47.9-110.2
3"	7.5	6.00	4x0.75	12.2	8.7	5.1	43.0	101.4-243.5
4"	9.0	7.50	8x0.75	13.8	9.4	5.1	60.6	172.0-412.7
5"	10.0	8.50	8x0.87	15.7	9.8	5.1	83.8	267.1-630.1
6"	11.0	9.50	8x0.87	18.9	11.2	5.1	120.2	375.8-902.0
8"	13.5	11.75	8x0.87	23.6	18.9	12.2	264.6	663.5-1592.5
10"	16.0	14.25	12x1.00	28.7	20.7	12.2	394.6	1055.3-2485.0
12"	19.0	17.00	12x1.00	33.5	21.1	12.2	553.4	1492.5-4057.5

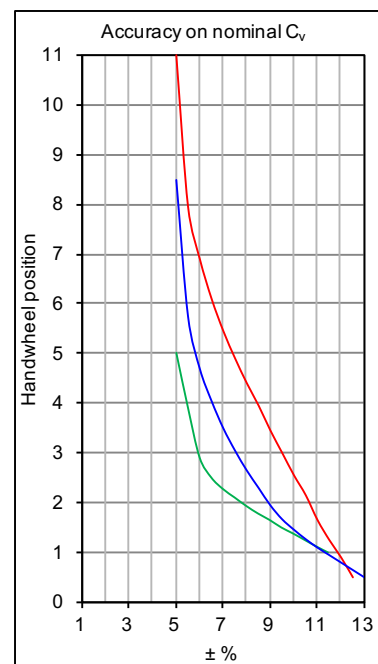
¹ Suggested flow range applicability (BS7350)

If used with measuring manometers different from those proposed by RWV please verify that sensibility of the measuring device is compatible with indicated minimum flow (see flow measurement paragraph)



Flow Measurement

Handwheel Position	Cv (GPM@1psi)								
	2"	2½"	3"	4"	5"	6"	8"	10"	12"
1.0	4.3	25.3	9.1	11.1	15.0	17.1	44.6	72.0	66.0
1.5	6.0	30.5	11.4	14.8	20.6	22.1	52.7	84.5	83.5
2.0	10.3	35.9	13.6	19.2	27.4	34.3	63.1	100.9	103.8
2.5	15.7	41.3	16.0	26.5	38.3	59.9	82.3	133.9	127.4
3.0	20.3	46.4	19.3	39.3	59.2	96.8	115.5	189.5	162.7
3.5	25.3	51.3	25.3	58.4	89.0	152.6	171.8	276.5	233.5
4.0	29.5	57.0	36.1	82.5	123.1	212.4	249.9	399.2	383.5
4.5	33.6	61.5	53.1	105.1	156.9	253.8	328.2	521.9	578.3
5.0	37.2	66.5	75.1	124.2	186.0	285.7	394.5	628.1	733.1
5.5	-	74.5	91.9	140.6	210.5	316.0	448.2	719.1	847.7
6.0	-	83.0	103.2	156.1	233.4	344.7	497.2	802.3	953.9
6.5	-	88.6	111.7	171.2	256.2	371.5	545.3	884.6	1067
7.0	-	92.9	118.7	184.9	277.2	395.6	586.8	952.3	1177
7.5	-	97.2	125.1	196.3	295.8	417.0	618.7	1013	1272
8.0	-	102.7	131.1	205.7	313.1	435.6	648.3	1070	1352
8.5	-	-	-	213.5	329.6	451.1	682.1	1127	1422
9.0	-	-	-	-	13.30	16.07	716.0	1182	1486
9.5	-	-	-	-	13.76	16.76	745.5	1234	1549
10.0	-	-	-	-	14.34	17.34	771.3	1284	1612
10.5	-	-	-	-	-	-	795.9	1330	1675
11.0	-	-	-	-	-	-	820.8	1373	1739

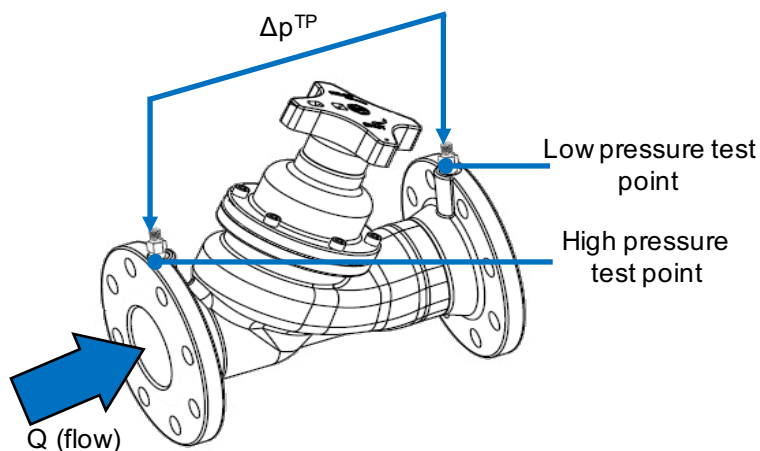


$$Q = C_v \cdot \sqrt{\Delta p^{TP}}$$

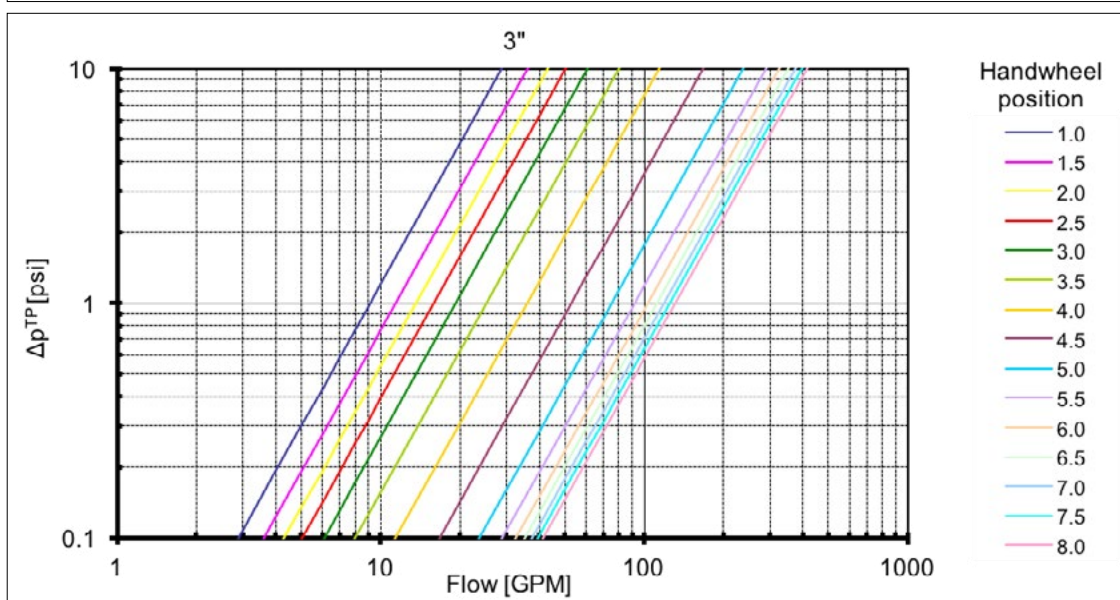
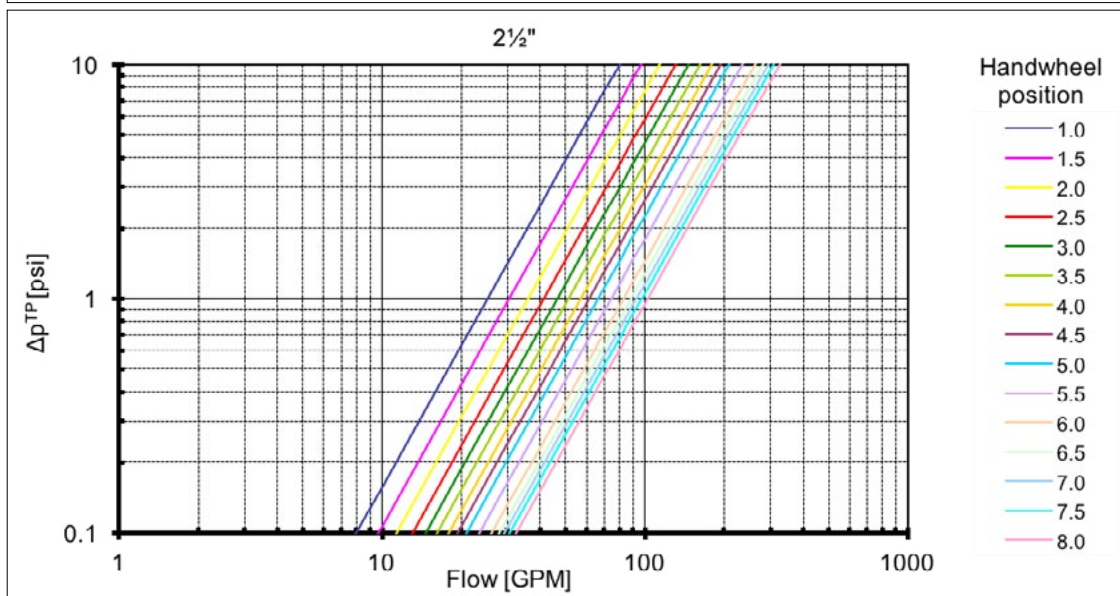
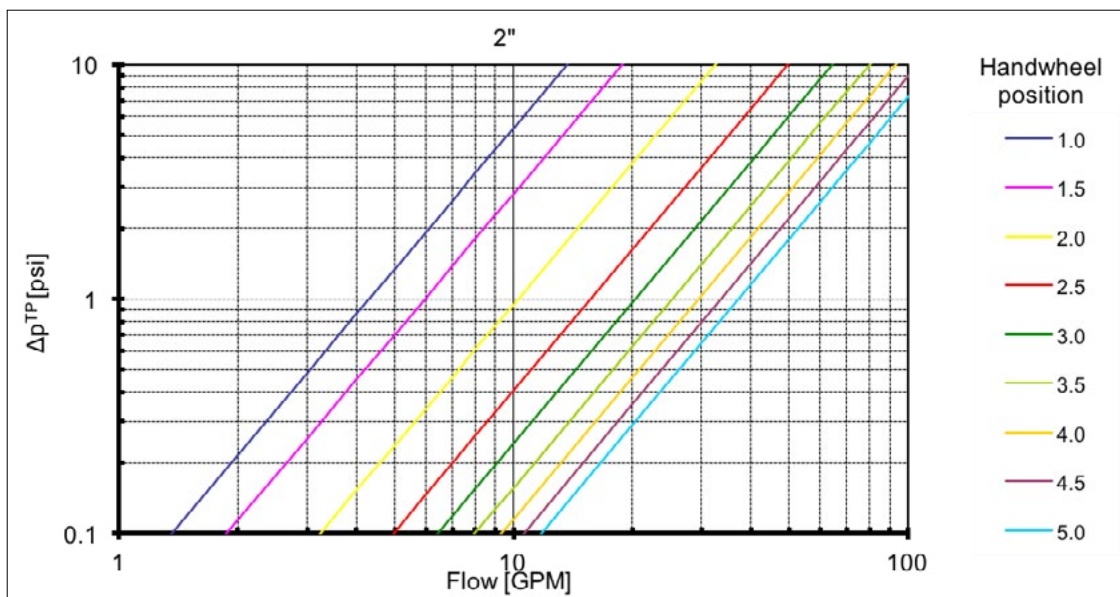
Formula linking flow Q (in GPM) and Δp measured at test points (in psi). Cv depends on handwheel position as indicated on table.

Minimum flow that can be measured for each diameter may be calculated by using in the formula minimum Δp that can be measured by used manometer.

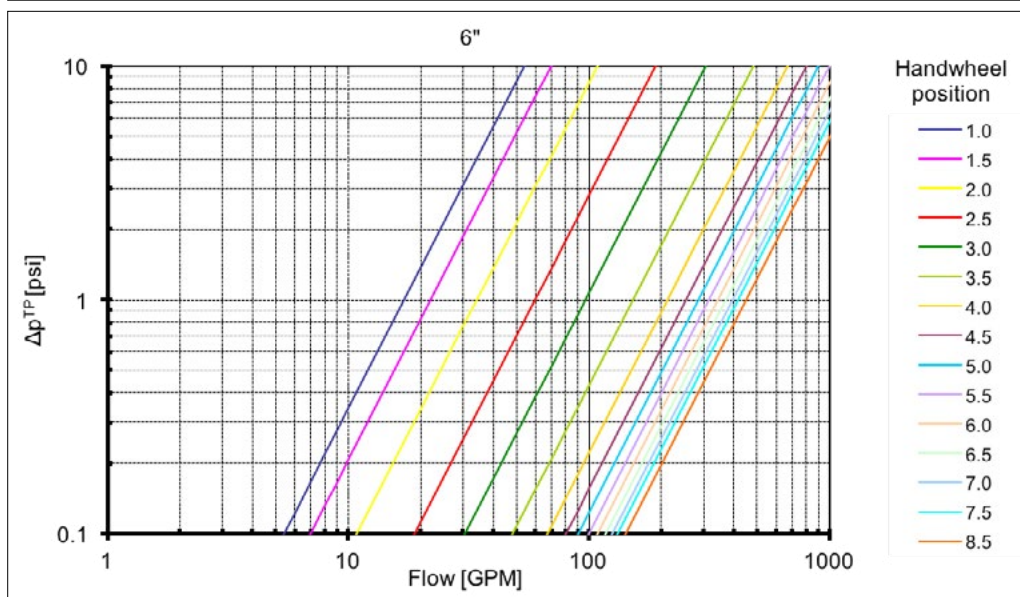
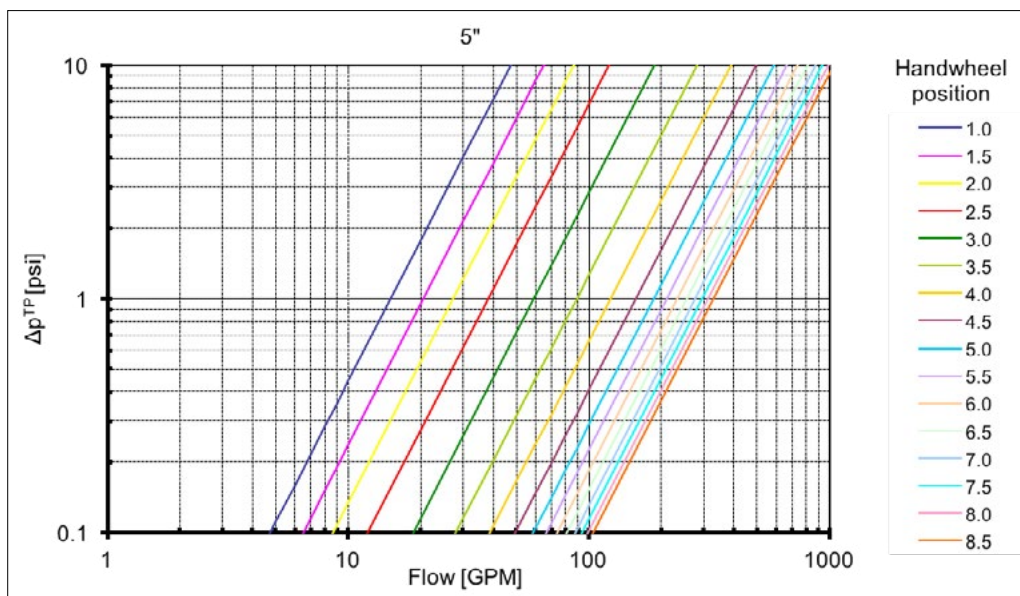
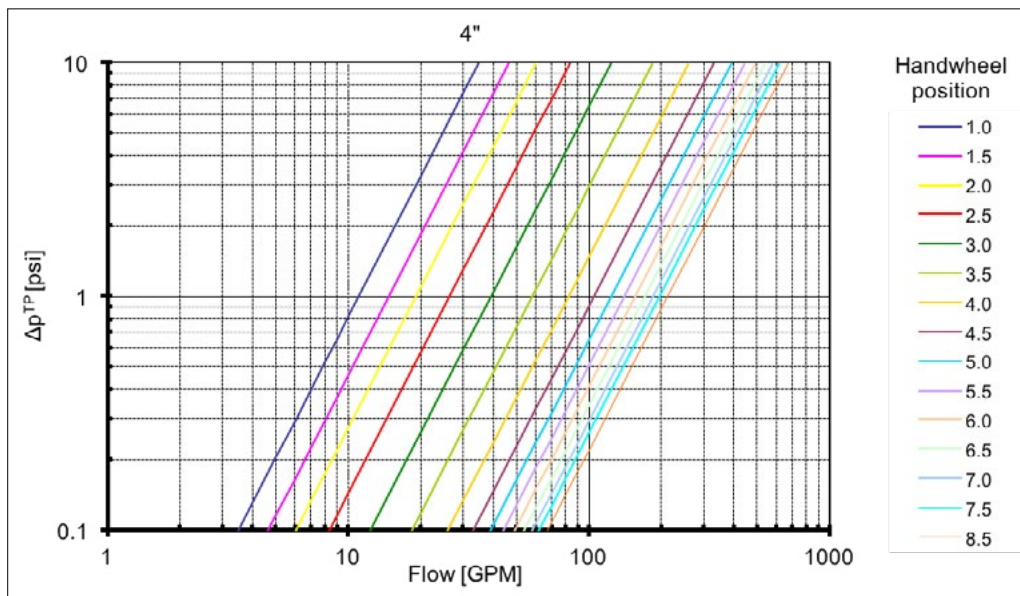
Valves are anyway designed for best performances when used on range previously suggested and as indicated by BS7350.



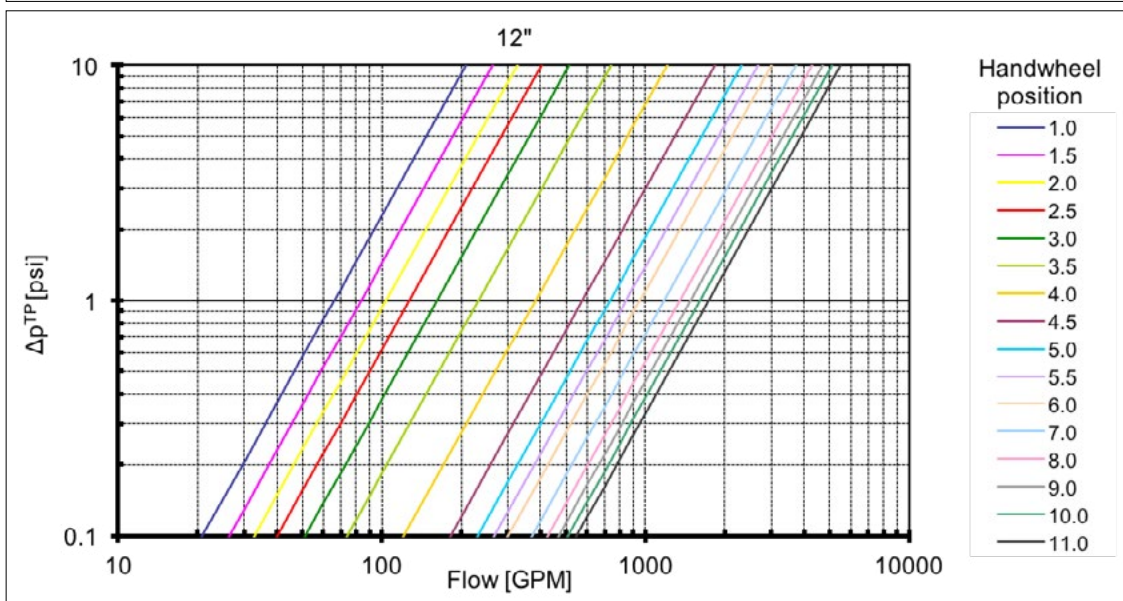
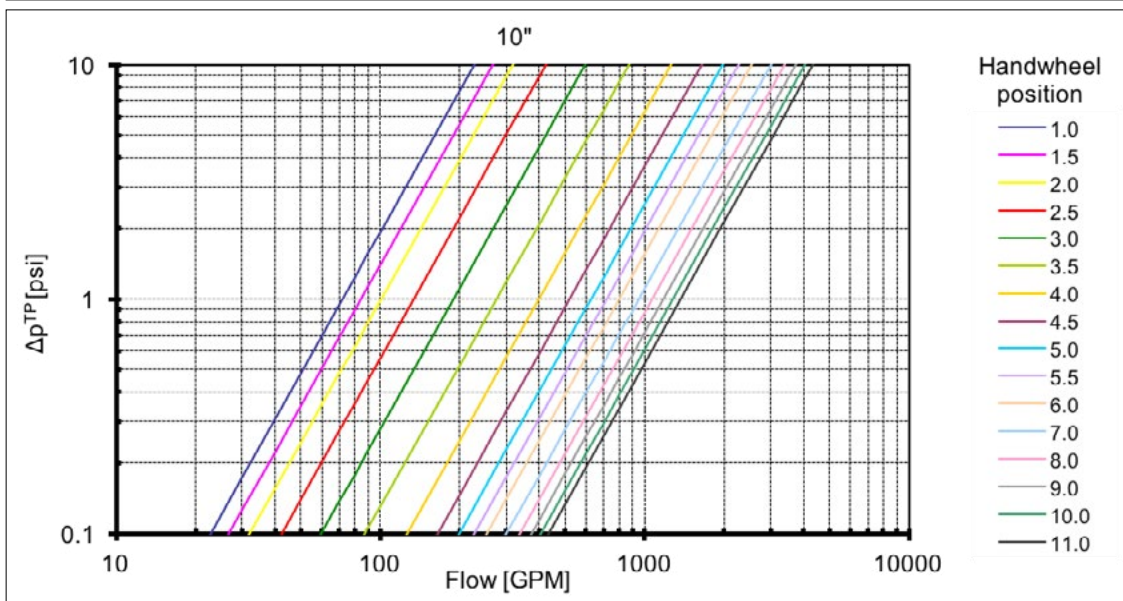
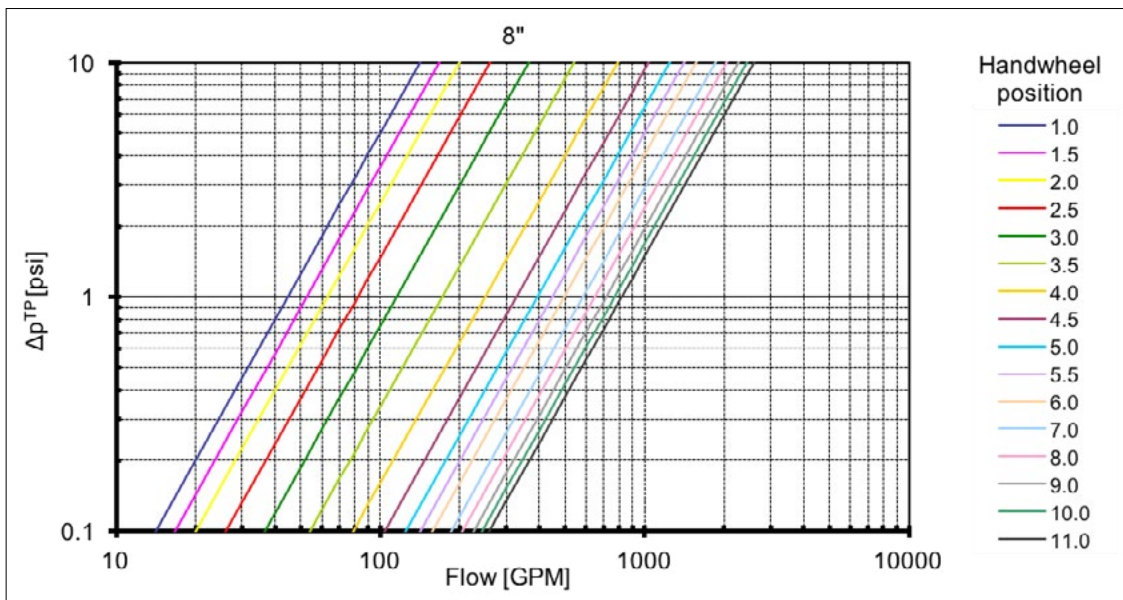
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Headloss calculation

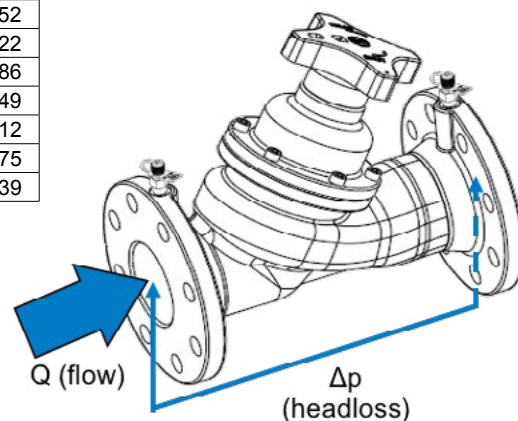
Handwheel Position	Cv (GPM@1psi)								
	2"	2½"	3"	4"	5"	6"	8"	10"	12"
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9.5	-	-	-	-	-	-	745.5	1234	1549
10.0	-	-	-	-	-	-	771.3	1284	1612
10.5	-	-	-	-	-	-	795.9	1330	1675
11.0	-	-	-	-	-	-	820.8	1373	1739

Copy of the table shown in Flow Measurement section

Δp (headloss) approximately equal to Δp^{TP}

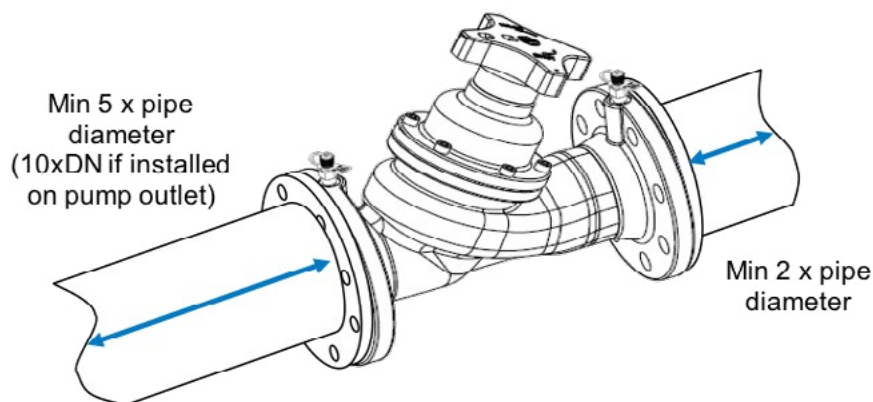
$$\Delta p = \left(\frac{Q}{C_v} \right)^2$$

Formula linking flow Q (in GPM) and theoretical valve headloss Δp (in psi). Cv depends on handwheel position as indicated on table.

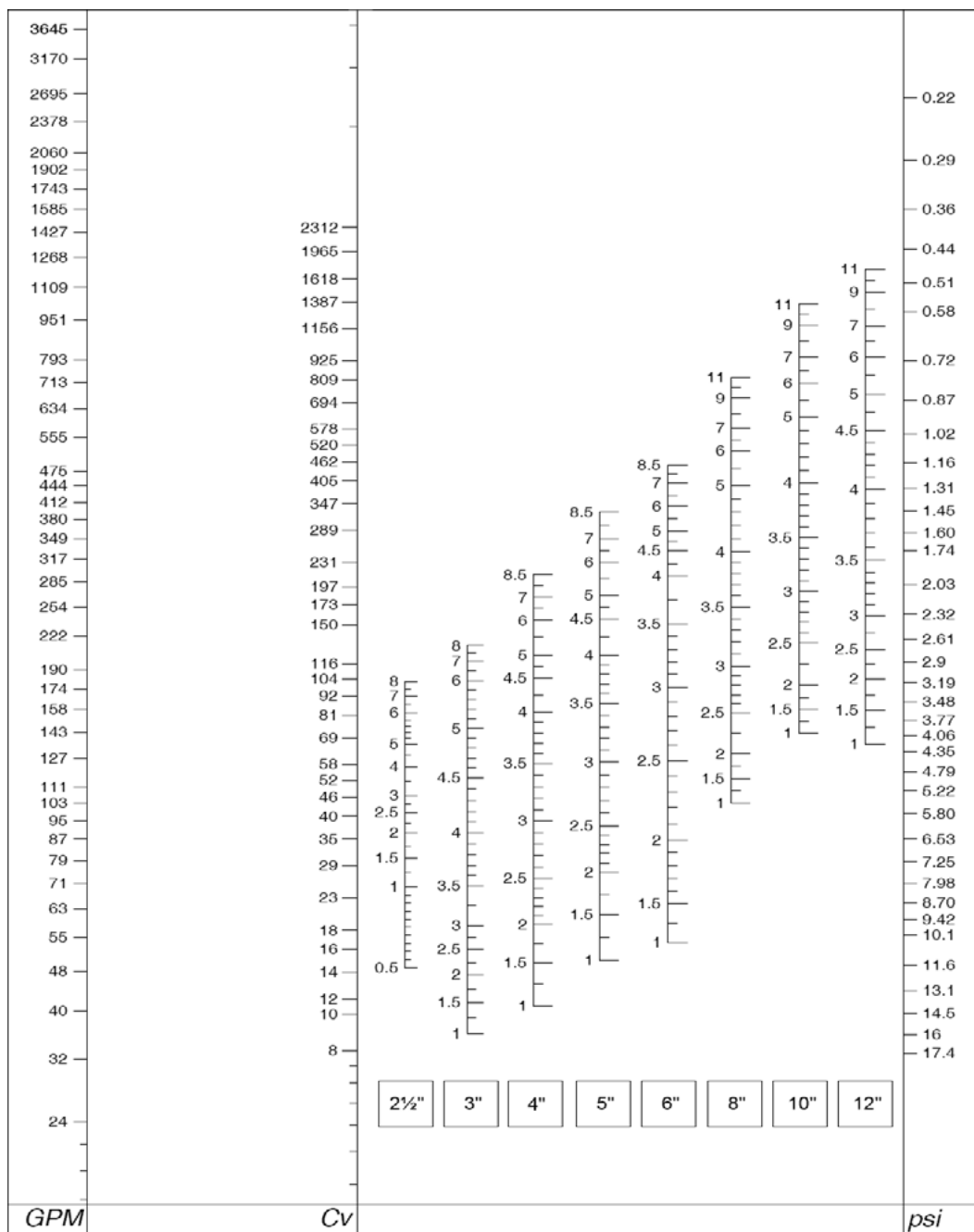


Installation

To obtain the best performances valve must be installed on a pipe with its same nominal size preceded and followed by straight pipe lengths as per figure indications.

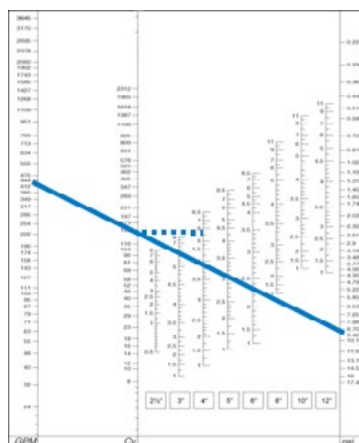


Presetting



Using the diagram above, it is possible to determine the presetting position of the valve with the given design flowrate and headloss:

- 1) draw a straight line joining design flowrate and design headloss;
- 2) determine design Cv value as intersection of drawn line and Cv axis;
- 3) draw a straight horizontal line from intersection previously identified and the specific valve size Axis;
- 4) intersection determines handwheel position to use for presetting.



In the example for a design flowrate of 440GPM and design Δp 9.4psi handwheel position of 5.6 is determined for a 4" valve