

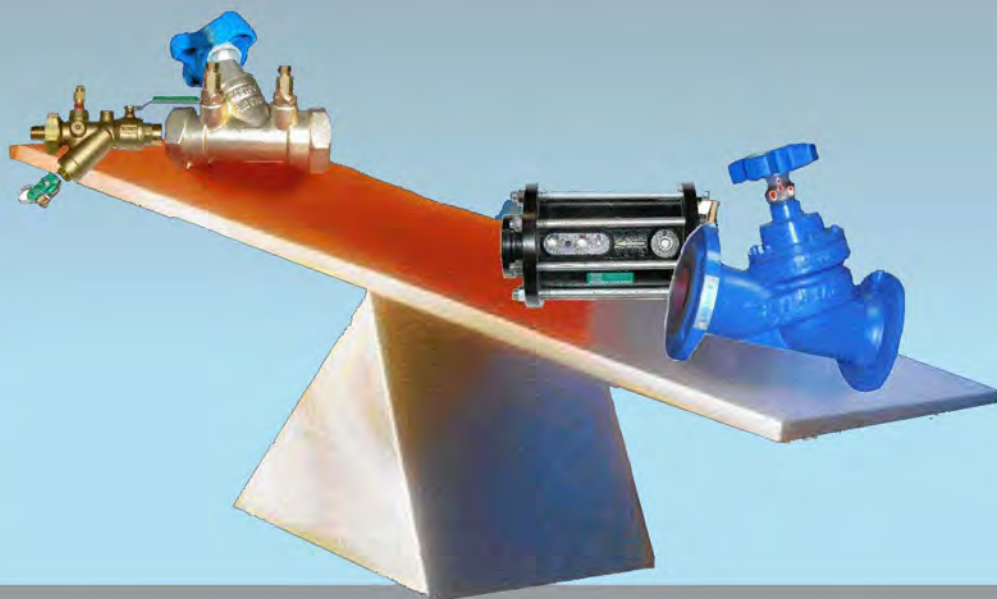
FLO FAB

FF

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With the **FLO**

Manual & Automatic Balancing Valves



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Manufacturer of Pumps, Tanks, Heat Exchangers & Accessories
for HVAC Market After-Sales Parts and Services

Manual & Automatic Balancing Valves

FLO FAB INC
LAKE WORTH,
FLORIDA, USA



**MANUAL & AUTOMATIC BALANCING VALVES
SERIES LGS - LAS - LAW - LAG - LAF- FM - FMI
UY - UM - UMS - UMT - UMTB - UMG
UMGB - UMW- UMWB**

MANUAL BALANCING INSTRUMENTS

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WHY BALANCING?

The hydronic system of pumps, pipes, fittings and central heating or cooling equipment is designed to produce and transport hot or cold water throughout the facility. At the other end of the system, we have terminal units which transform that energy into warm or cool air. The amount of heating or cooling for each space depends upon the load at any particular time and in that particular space. If left alone, the hot or chilled water would distribute itself according to the pipe friction and pumping equipment, but not according to load requirements. What is needed in a device to bridge the gap between the incrementally sized pumping and piping system and the individual flows to the production and terminal (space) equipment. The hydronic balancing valve is uniquely designed for this mission. By accurately measuring and precisely trimming flows, the balancing valves effectively match maximum load to required flow.

Modern balancing valves allow the system to function efficiently as designed and can verify flows. Since hot water boilers, chillers, cooling towers, pumps, pipes, control valves and terminal units are incrementally sized, the balancing valve is essential to match individual load/flow requirements to unit sized equipment.

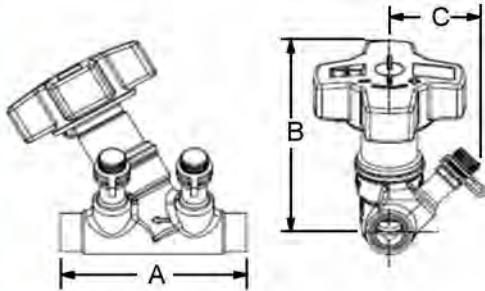
BALANCING VALVE

LGS, LGSS & LGSG series

The unique design of each Flo fab balancing product offers the specifier, installer and owner the best features necessary to achieve accurate and efficient balancing of hydronic heating or cooling systems at lowest installed cost.

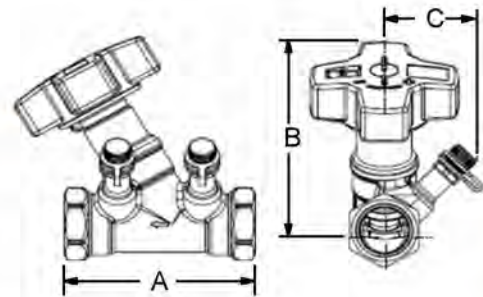
Common features include :

- Location of handwheel and test points on the same side for easy access
- Location of test point on the end for even easier access
- Easy to reorient digital / vernier handwheel
- Self-sealing pressure / temperature test points use standard insertion probes to eliminating additional components
- One valve for 5 functions :
 - Throttling
 - Measuring (pressure & temperature)
 - Positive shutoff
 - Draining
 - Filling
- Optional hose connection with ball valve for either test points (drain the pipe you want regardless of whether the valve is in the supply or return piping)
- Low minimum pressure drop (Y-pattern)
- Precise throttling (globe style)
- Minimum of 7 unique handwheel positions
- Install valve in the supply or return line – with flow in direction of arrow cast into body
- Install horizontally, vertically or obliquely
- Install with handwheel up, down or the side
- Lowest inlet and outlet straight pipe requirements with assured accuracy
- Rated for 235 psi (PN16) at 300°F (150°C)
- Dezincification resistant brass and bronze components
- Built-in hidden memory stop ensures return to balanced position after shutoff
- Enclosed red handwheel lock cap prevents Handwheel movement – easily defeated for authorized valve repositioning
- Optional preformed insulation speeds installation
- Thread and sweat connections for ½" - 2" sizes
- 125# flanges on 2½" - 12" sizes
- Groove connections for 2½" - 12" sizes



LGSS SERIES - Specifications						
Connection		Solder, Sweat				
Maximum Working Pressure		300 psi/20 Bar (PN 20)				
Operating Temperature Range		-22°F to 250°F (-30°C to 120°C)				
Materials of Construction		Body, Bonnet		Dezincification Resistant Brass		
		Gaskets		EPDM		
		Seat Seal		EPDM		
		Handwheel		Polyamide Plastic		
LGSS						
Valve Size		Dimensions			Approx. Weight	Handwheel Turns
Nominal Dimension		Inches / mm				
Inches	mm	A - Length	B - Height	C - P/T Offset	Lbs / Kg	
1/2	DN 15	3.39 / 86	3.74 / 95	1.57 / 40	1.2 / 0.53	10
3/4	DN 20	3.54 / 90	3.74 / 95	1.65 / 42	1.3 / 0.58	10
1	DN 25	4.02 / 102	3.78 / 96	1.73 / 44	1.7 / 0.77	10
1-1/4	DN 32	4.72 / 120	3.78 / 96	1.85 / 47	2.7 / 1.2	10
1-1/2	DN 40	5.2 / 132	4.25 / 108	1.93 / 49	3.3 / 1.5	10
2	DN 50	6.46 / 164	4.37 / 111	2.09 / 53	5.1 / 2.3	10

LGS SERIES - Specifications						
Connection		NPT (Fern.)				
Maximum Working Pressure		300 psi/20 Bar (PN 20)				
Operating Temperature Range		-22°F to 250°F (-30°C to 120°C)				
Materials of Construction		Body, Bonnet		Dezincification Resistant Brass		
		Gaskets		EPDM		
		Seat Seal		EPDM		
		Handwheel		Polyamide Plastic		
LGS						
Valve Size		Dimensions			Approx. Weight	Handwheel Turns
Nominal Dimension		Inches / mm				
Inches	mm	A - Length	B - Height	C - P/T Offset	Lbs / Kg	
1/2	DN 15	3.39 / 86	3.74 / 95	1.57 / 40	1.2 / 0.53	10
3/4	DN 20	3.54 / 90	3.74 / 95	1.65 / 42	1.3 / 0.58	10
1	DN 25	4.02 / 102	3.78 / 96	1.73 / 44	1.7 / 0.77	10
1-1/4	DN 32	4.72 / 120	3.78 / 96	1.85 / 47	2.7 / 1.2	10
1-1/2	DN 40	5.2 / 132	4.25 / 108	1.93 / 49	3.3 / 1.5	10
2	DN 50	6.06 / 154	4.37 / 111	2.09 / 53	5.1 / 2.3	10



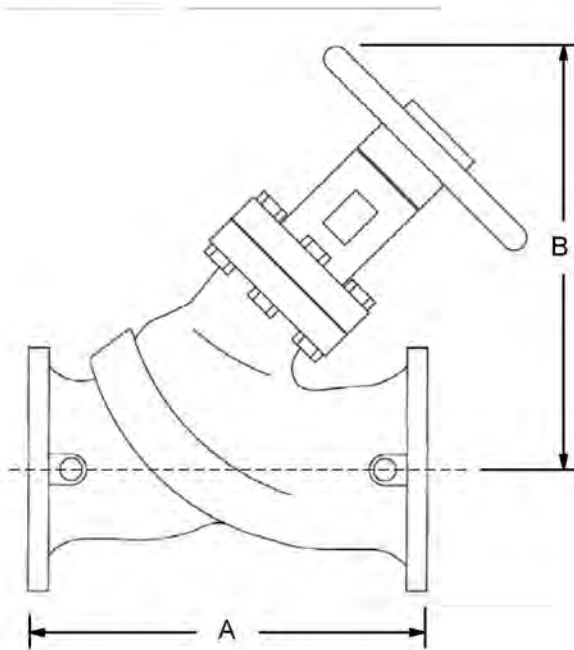
VALVE SIZING & SELECTION GUIDE

When maximum flow is known but a pressure drop through the balancing valve is unknown, select a balancing valve for a maximum pressure drop of 2 ft. wg (5.7 kPa) in the full open position as shown in the following tab.

Valve Selection Guide				
Valve Size		Minimum Flow	Nominal Range of Flow	Maximum Flow
Nominal Dimensions				
Inches	mm	GPM / LPM		
1/2	DN 15	.14 / .52	0.5 – 3.8 / 1.89 – 14.36	12.1 / 45.7
3/4	DN 20	.26 / .98	3.8 – 5.5 / 14.36 – 20.8	17.4 / 65.7
1	DN 25	.37 / 1.38	5.5 – 9.5 / 20.8 – 36	30 / 113.4
1-1/4	DN 32	.60 / 2.28	9.5 – 14 / 36 – 53	44.6 / 169
1-1/2	DN 40	.91 / 3.46	14 – 20 / 53 – 76	66.4 / 251
2	DN 50	1.52 / 5.76	20 – 33 / 76 – 125	107.2 / 406

SERIES LGS 2" TO 12" BALANCING VALVES

DUCTILE IRON GLOBE VALVE (Pressure Rating 300 lbs.)



Connection :

- ANSI 125# Flanged

Maximum Working Pressure :

- 300 psi (2069 kPa)

Operating Temperature Range :

- 1 - 4°F to 520°F (10°C to 120°C)

Material of Construction :

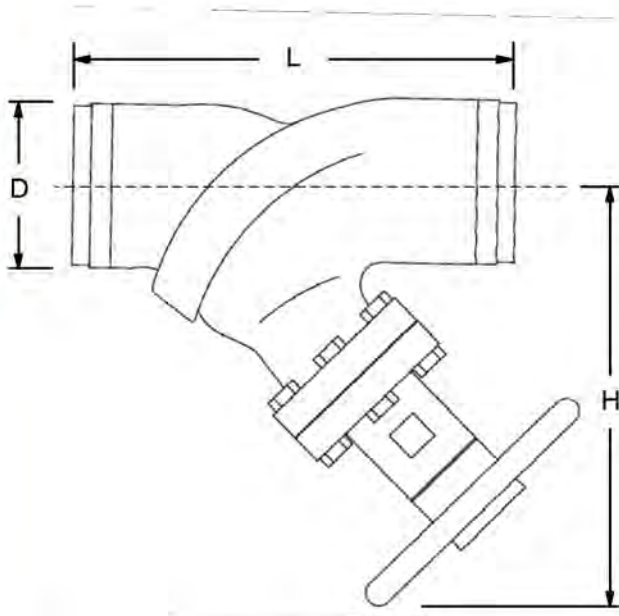
- Body :
 - > Ductile Iron
- Gasket :
 - > EPDM
- Seat Seal :
 - > PTFE

LGS								
Valve Size		Dimensions		Approx. Weight	Hand Wheel Turns	Valve Selection Guide		
Nominal Dimensions		A-Length	B-Height			Minimum Flow	Nominal Range of Flow	Maximum Flow
Inches	mm	Inches / mm		Lbs. / Kg	GPM / LPM			
2	DN 50	9.05 / 230	9.84 / 250	33 / 15	10	-	29 - 40 / 109 - 151	-
2-1/2	DN 65	11.4 / 290	10.9 / 278	47 / 21	8	-	40 - 102 / 151 - 386	-
3	DN 80	12.2 / 310	11.4 / 292	57 / 26	8	-	102 - 125 / 386 - 473	-
4	DN 100	13.7 / 350	12.2 / 310	82 / 37	8	-	125 - 210 / 473 - 794	-
5	DN 125	15.7 / 400	13.7 / 350	143 / 65	8	-	210 - 300 / 794 - 1135	-
6	DN 150	18.8 / 480	15.1 / 385	181 / 82	13	-	300 - 400 / 1135 - 1514	-
8	DN 200	23.6 / 600	20.1 / 510	275 / 125	12	30.3 - 114	400 - 650 / 1514 - 2460	2100 / 7940
10	DN 250	28.7 / 730	20.9 / 530	490 / 730	12	76.3 / 289	650 - 1300 / 2460 - 4921	4050 / 15300
12	DN 300	33.5 / 850	24.0 / 610	573 / 260	18	76.3 / 289	1300 - 1600 / 4921 - 6056	4750 / 17590

*Note : 14", 16" and 18" Available on request

SERIES LGSG 2-1/2" TO 12" BALANCING VALVES

CAST IRON GLOBE VALVE (Pressure Rating 300 lbs.)



Connection :

- 300# Grooved

Maximum Working Pressure :

- 300 psi (2069 kPa)

Operating Temperature Range :

- 1 - 4°F to 520°F (10°C to 120°C)

Material of Construction :

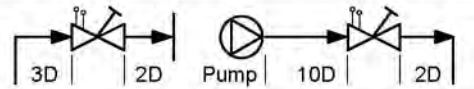
- Body :
 - Cast Iron
- Stem :
 - DZR
- Seat Seal :
 - PTFE
- Handwheel :
 - Polyamide Plastic

LGSG									
Valve Size		Connection Part No. - P/N	Dimensions			Approx. Weight	Hand Wheel Turns	Valve Selection Guide	
Nominal Dimensions			L	H	D			Nominal Range of Flow	
Inches	mm		Inches (mm)			Lbs. / Kg	GPM	LPM	
2-1/2	DN 65	Groove	11-7/16 (290)	2-7/8 (73)	7-3/8 (188)	19 (8.6)	8	40 - 102	151 - 386
3	DN 80	Groove	12-1/4 (310)	3-1/2 (88.9)	8 (203)	28 (12.7)	8	102 - 125	386 - 473
4	DN 100	Groove	13-3/4 (350)	4-15/16 (114)	9-1/2 (240)	45 (20.4)	8	125 - 210	473 - 794
5	DN 125	Groove	15-3/4 (400)	5-9/16 (141)	11-1/4 (283)	71 (32.2)	8	210 - 300	794 - 1135
6	DN 150	Groove	18-7/8 (480)	6-5/8 (168)	11-1/4 (283)	96 (43.6)	8	300 - 430	1135 - 1627
8	DN 200	Groove	23-5/8 (600)	8-5/8 (219)	18-3/8 (467)	255 (116)	12	430 - 760	1627 - 2876
10	DN 250	Groove	28-3/4 (730)	10-3/4 (273)	18-15/16" (480)	376 (171)	12	760 - 1350	2876 - 5110
12	DN 300	Groove	33-7/16 (850)	12-3/4 (324)	20-1/4 (515)	519 (136)	12	1350 - 1500	5110 - 5678

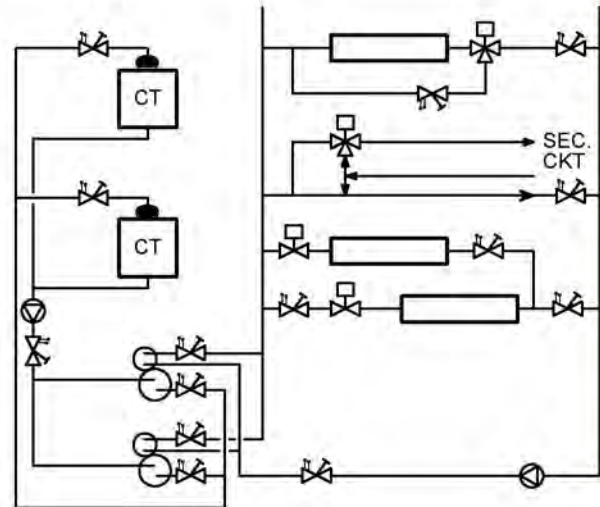
VALVE INSTALLATION GUIDE

Accurate flow measurement requires that the velocity distribution near the balancing valve stays constant, regardless of the total flow through the pipe. Fittings, such as elbows and tees, disturb the normal flow profile which is established through straight pipe; pumps create even greater disturbances. Failure to allow water flows around fittings and pumps to normalize can affect measuring accuracy by as much as 20% when the valve is in the worst, fully open, position. Minimum lengths (diameters, D) of straight pipe before and after the balancing valve prevent these errors. Follow the flow direction arrow on the valve body for best accuracy. Valves are designed for vertical, horizontal or inclined installation.

MINIMUM PIPE DIAMETERS FROM FITTINGS



1. Typical locations and piping arrangements for manual balancing valves.
2. Flo Fab balancing valves can be installed on the supply piping to vertical coils to allow complete draining using the optional hose connection while still maintaining correct flow through the balancing valve.
3. Flanged valve with handwheel lock installed. Handwheel lock prevents handwheel rotation and operates independently of the hidden memory stop standard feature.
4. Accessories are available for all valves and include hose connection kit, probe extenders and extra valve identification tags.
5. Rimmed handwheel used for 8" (DN 200) and larger valves.



CHOOSE WISELY!

The modern Y-patterned balancing valve combines the basic features of many less capable products with its unique ability to accurately measure and throttle flows. In essence, the full featured balancing valve can take the place of many individual devices:

1. Isolation and bubble tight shutoff of a portion of the piping system, commonly done with quarter-turn ball, plug or butterfly valves.
2. Gradual throttling throughout a wide range, common to globe style valves.
3. Low inherent pressure loss, a key feature of the Y-pattern design.
4. Self sealing, standard P/T fitting, large enough to accommodate common pocket thermometers or standard insertion pressure probes, necessary to verify operating temperatures, pressures and flows.
5. Determining actual water flow by measuring pressure drop through a graduated and known resistance.
6. Variable orifice design – as the valve closes to reduce flow, the precision measuring orifice size decreases producing better accuracy over the entire operating range.
7. Multi-turn, vernier & digital scales resulting in precise, no guess, readout of plug position and valve flow coefficient (Cv).
8. Optional hose connection with integral shutoff valve replaces time consuming field fabricated assemblies with one quickly installed fitting.

TYPICAL SPECIFICATIONS

BALANCING VALVES
½" (DN15) - 12" (DN300)

1.0 General – Furnish and install, as shown on the drawings and /or schedules, Flo Fab Balancing Valves, to ensure the accurate balancing of all flows in the hydronic heating and cooling systems. Water balancing shall meet the specified flows with a maximum tolerance of +/- 10%. Upon completion, the balancing shall be documented in a report, which shall be submitted to the engineer for approval.

2.0 Balancing Valve Characteristics

2.1 All balancing valves shall be of the "Y" pattern globe style design. All balancing valves must offer a minimum of seven (7) full rotation of the handwheel for positioning accuracy of +/- 1%.

2.2 All balancing valves shall have documented measuring accuracy of +/- 7% within the normal setting range of the valve.

2.3 All balancing valves shall have integral self-sealing ports for measuring differential pressure and fluid temperature using standard pressure and temperature test probes. Test ports shall be located inline with the handwheel, on the same end of the valve and shall be removable to function as integral drain ports.

2.4 All balancing valves must offer 100% positive, leakproof shutoff against the same fluid temperature and pressure ratings as the body. Minimum body ratings are 235 psi (PN16) at 300°F (150°C).

2.5 All balancing valves must include a hidden memory stop to ensure return to the balanced position after shutoff. An enclosed anti-tamper lock feature shall prevent handwheel repositioning after setting.

2.6 All balancing valves ½" (DN15) through 12" (DN300) shall have digital/vernier adjustment for precise readout.

TYPICAL SPECIFICATIONS

BALANCING VALVES ½" (DN15) - 12" (DN300)

2.7 (Option) A valved hose bib fitting shall be available for installation on all ½" (DN15) through 12" (DN300) sizes. The hose bib fitting shall be capable of being placed on either side of the valve plug to accommodate draining and filling of horizontal or vertical coils.

2.8 Material Characteristics – All balancing valves in sizes ½" (DN15) through 2" (DN50) shall have bronze bodies and shall have either solder or NPT threaded connections to match the piping system. Valve bodies in size 2½" (DN65) through 12" (DN300) shall be manufactured from cast iron equivalent to ASME/ANSI B 16.5 and shall be flanged to 125 lb. standards or grooved to 300 lb. standards. All wetted brass parts shall be alloyed to resist dezincification. No dielectric fittings shall be required for installation.

3.0 Valve Sizing – All balancing valves shall be sized to perform in a normal operation range between 25% and 100% of the full open position, at a minimum differential pressure between 1 to 3 ft. WG.

4.0 Manufacturer – Flo Fab Inc.

5.0 Warranty – Valves shall be free from material and workmanship defects for a period of 12 months from date of installation or from 18 months from date of shipment, whichever comes first.



Pressure/Temperature Rating

300 lbs from -10 to 250°F

Test Pressure

Shell: 300 lbs

Seat: 250 lbs

Specification

Kitemarked to BS7350

Inside screw, non-rising stem

Copper alloy stem

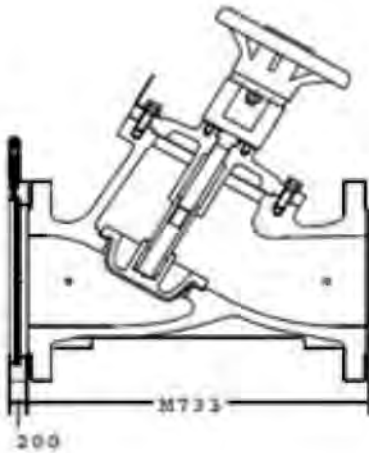
EPDM coated disk

Backseating feature

Flanged to BSEN 1092-2 150 lbs

Fitted with regulating disk,
double regulating device and indicator
pressure ports no SS-2501

Note: The maximum temperature is
determined by the EPDM elastomer
coated disk

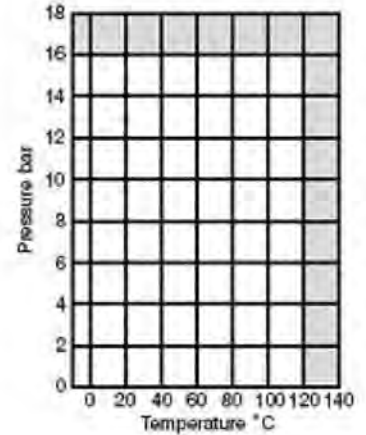


Series LGS sizes 2 to 6 inches Balancing Vales

Cast Iron Globe Valve

Pressure Rating: 300 lbs

Material: Cast Iron



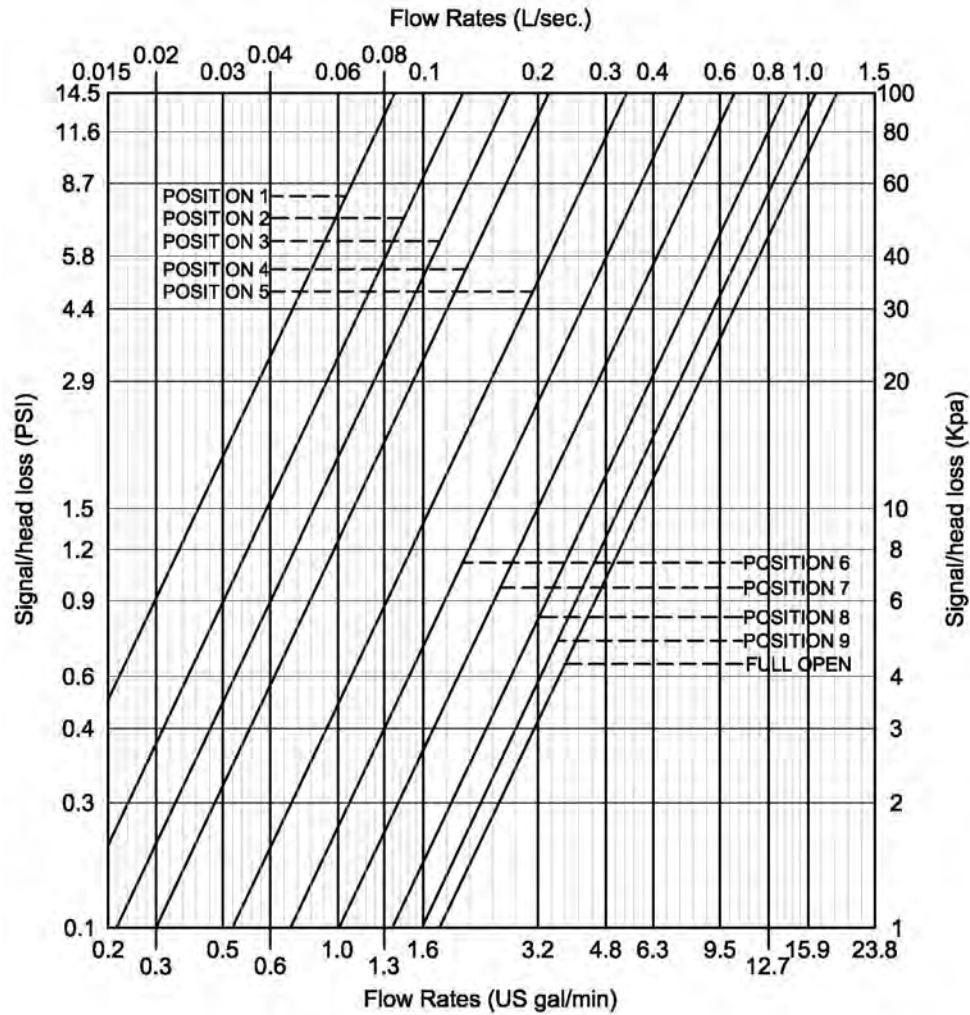
Material Specification

Component	Material	Specification	
		BS	EN
Indicator Ring	Polymer		
Indicator	Polymer		
Gland	H T Brass	12164 CW721R	B138 C67500
Gland Packing	Graphite		
Stuffing Box	H T Brass	12164 CW721R	B138 C67500
Stem (50 to 100mm)	H T Brass	12164 CW721R	B138 C67500
Stem (125 to 200mm)	Stainless Steel	10088-1 X2 CrNiNo17-12 -2	A276-316L
Indicator Sleeve	Polymer		
Bonnet	Ductile Iron	1563 EN JS 1050	A536 80 55 06
Bonnet Gasket	Asbestos Free		
Disk Stem Nut	H T Brass	12164 CW721R	B138 C67500
Disk	Stainles Steel	18-8	A276-304
Disk Coating	EPDM		
Body	Cast Iron	1561 EN-JLI040	A126 CI B

Dimensions

Nominal Size	inches	2"	2 1/2"	3"	4"	5"	6"
Nominal Size	mm	50	65	80	100	125	150
A	mm	230	290	310	350	400	480
B	mm	250	278	292	310	350	385
C	mm	166	166	166	166	250	250
D	mm	165	185	200	220	250	285
Weight	kg	15	21	26	37	65	82

DN 15 1/2" BALANCING VALVE "LGS" FLOW DIAGRAM (NPT & C X C)

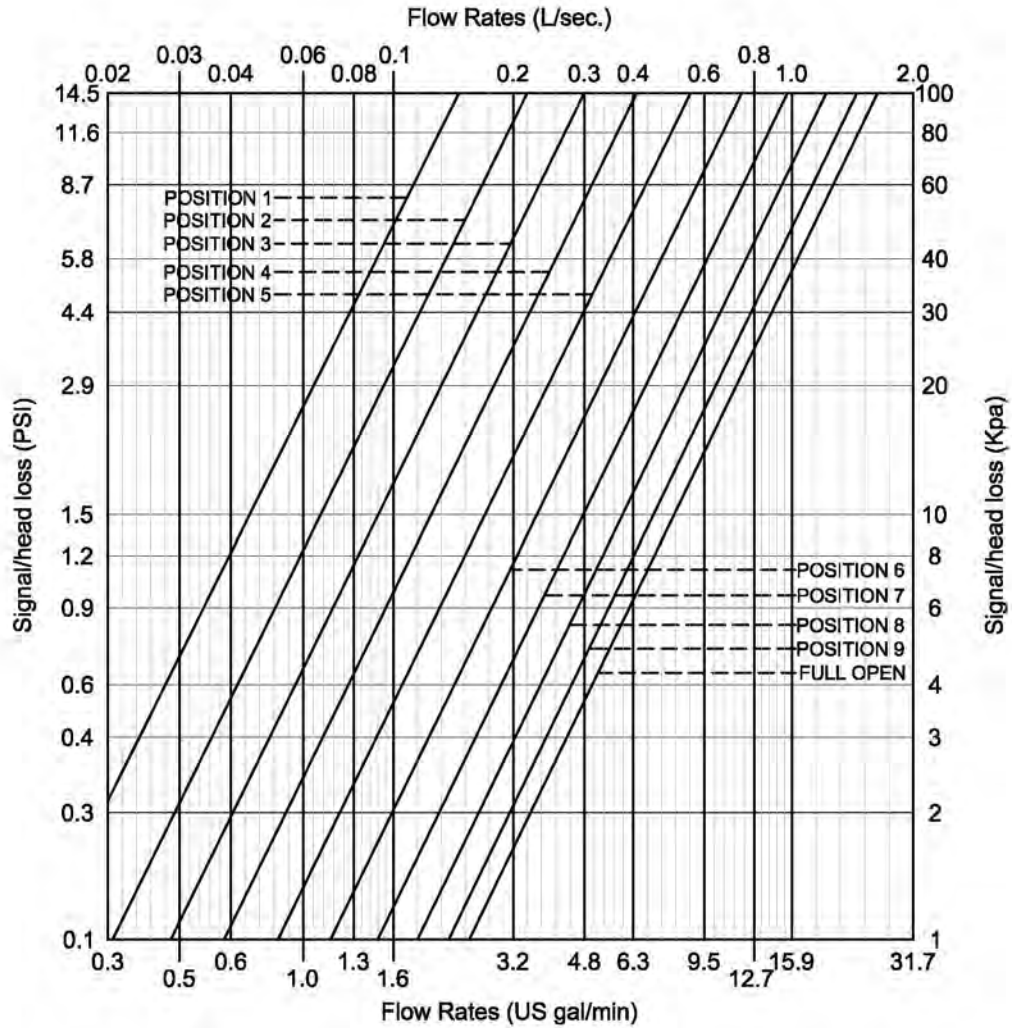


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.



SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008

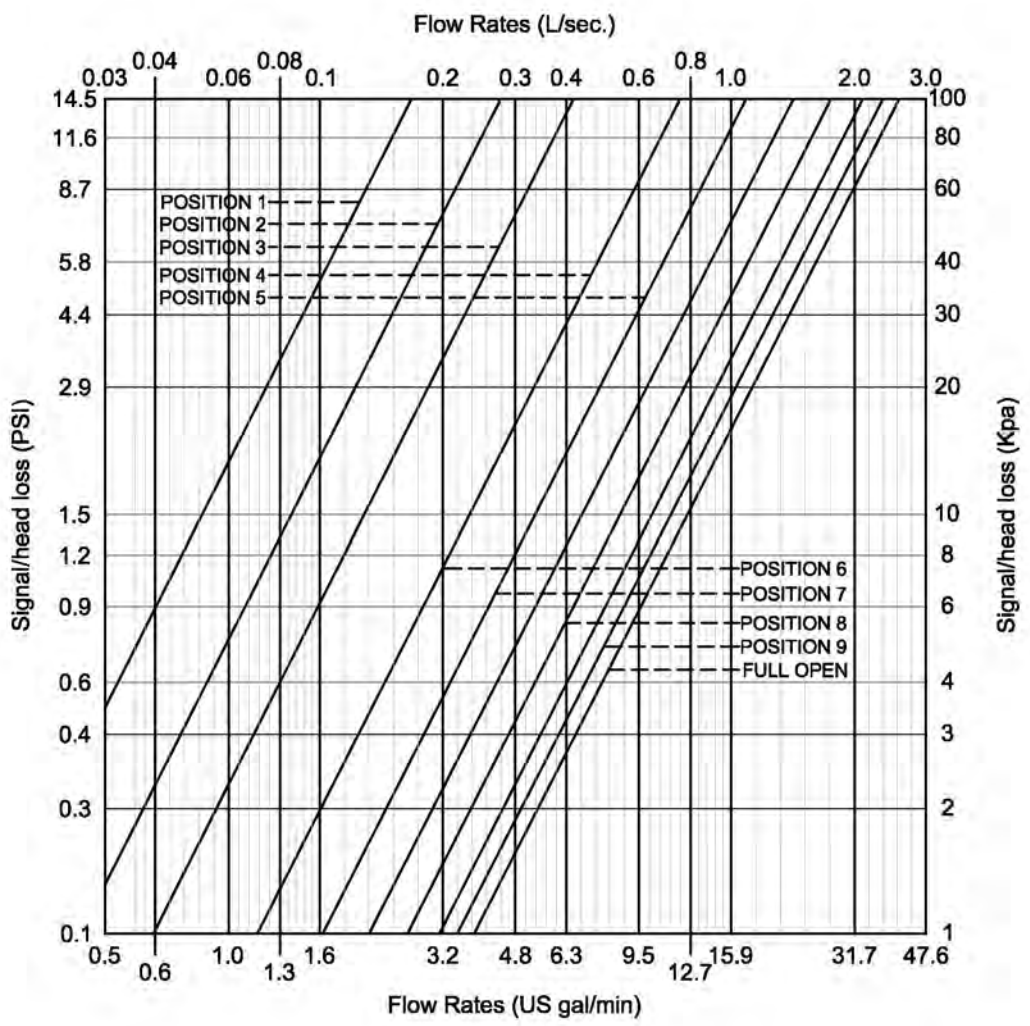
DN 20 3/4" BALANCING VALVE "LGS" FLOW DIAGRAM (NPT & C X C)



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

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DN 25 1" BALANCING VALVE "LGS" FLOW DIAGRAM (NPT & C X C)

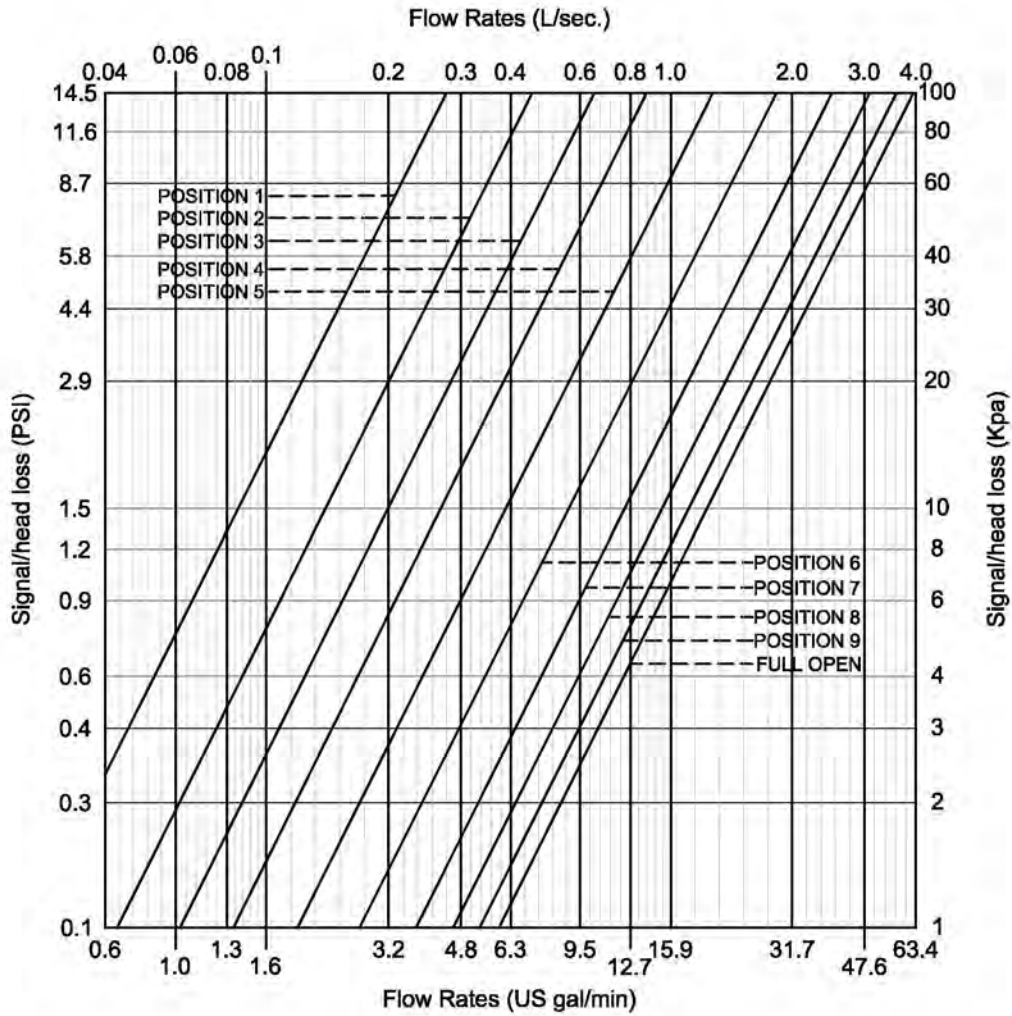


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.



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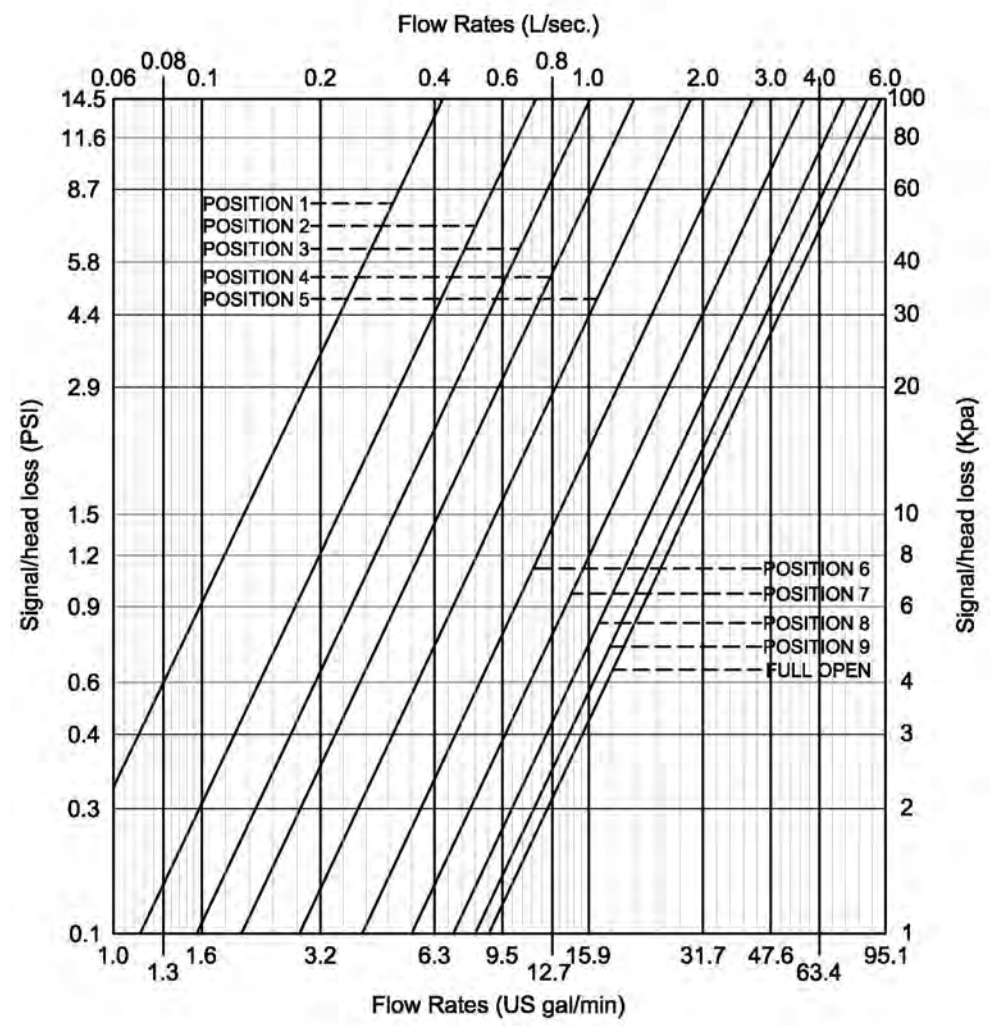
DN 32 1-1/4" BALANCING VALVE "LGS" FLOW DIAGRAM (NPT & C X C)



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

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DN 40 1-1/2" BALANCING VALVE "LGS" FLOW DIAGRAM (NPT & C X C)

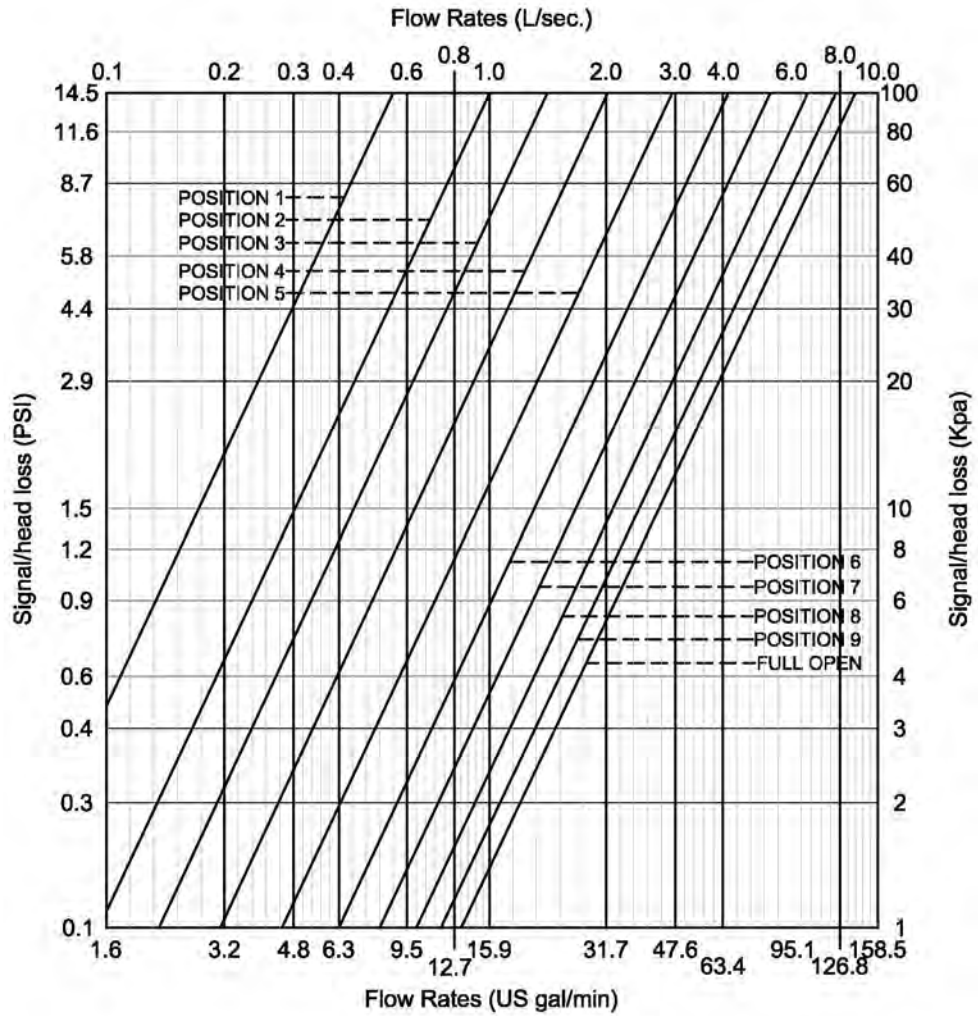


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.



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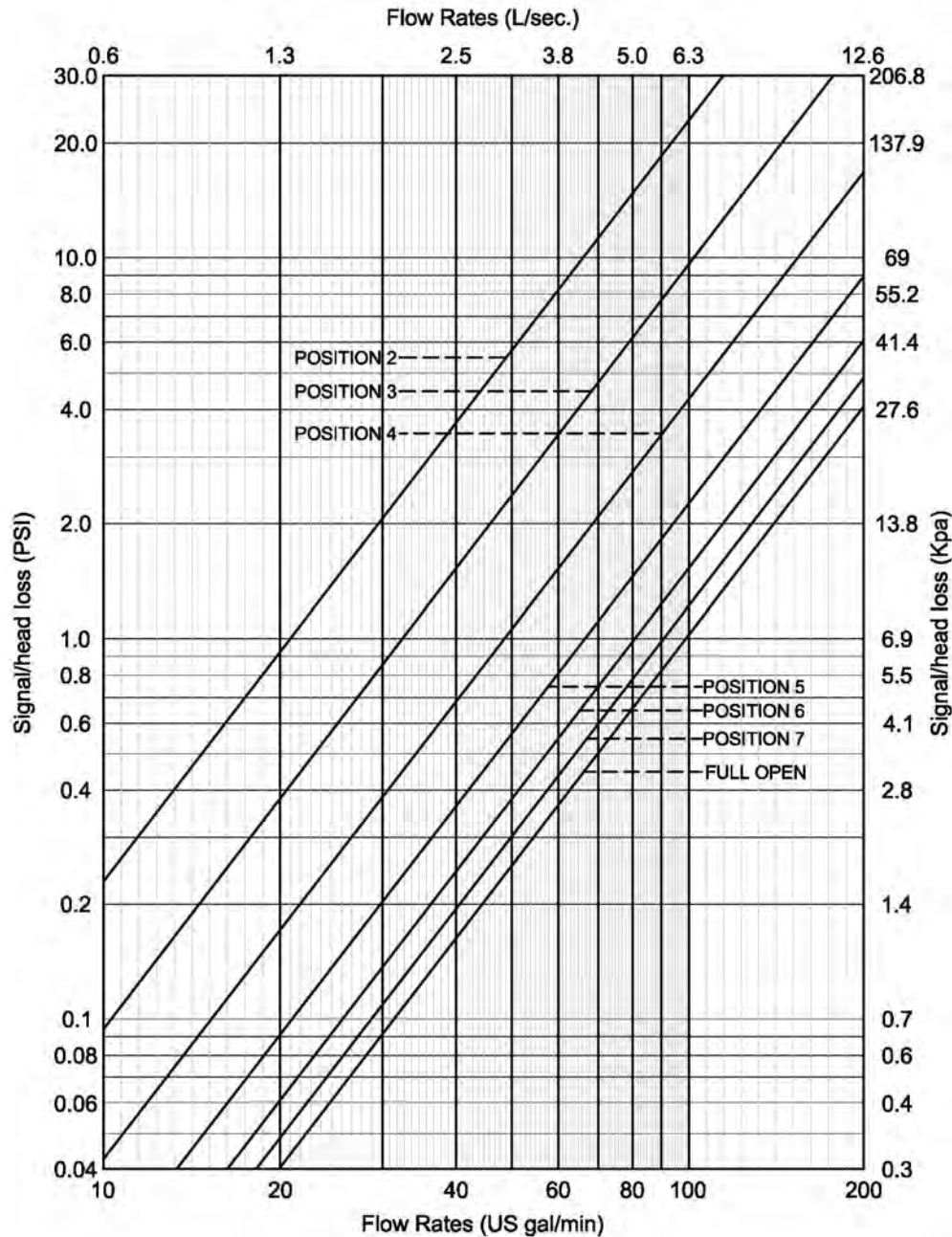
DN 50 2" BALANCING VALVE "LGS" FLOW DIAGRAM (NPT & C X C)



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

DN 65 2-1/2" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)

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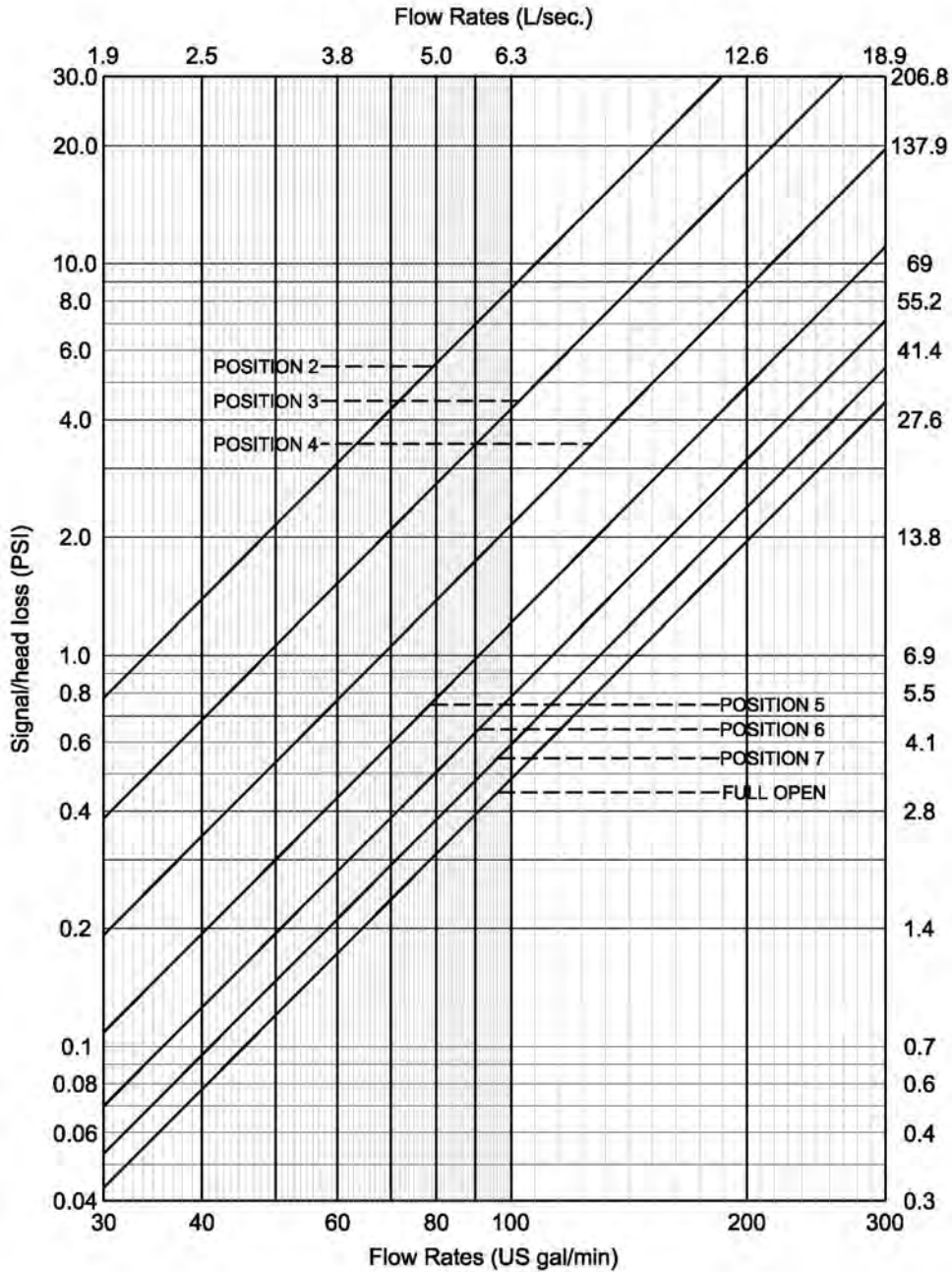


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
Velocity based on average inside diameter of Schedule 40 pipe.



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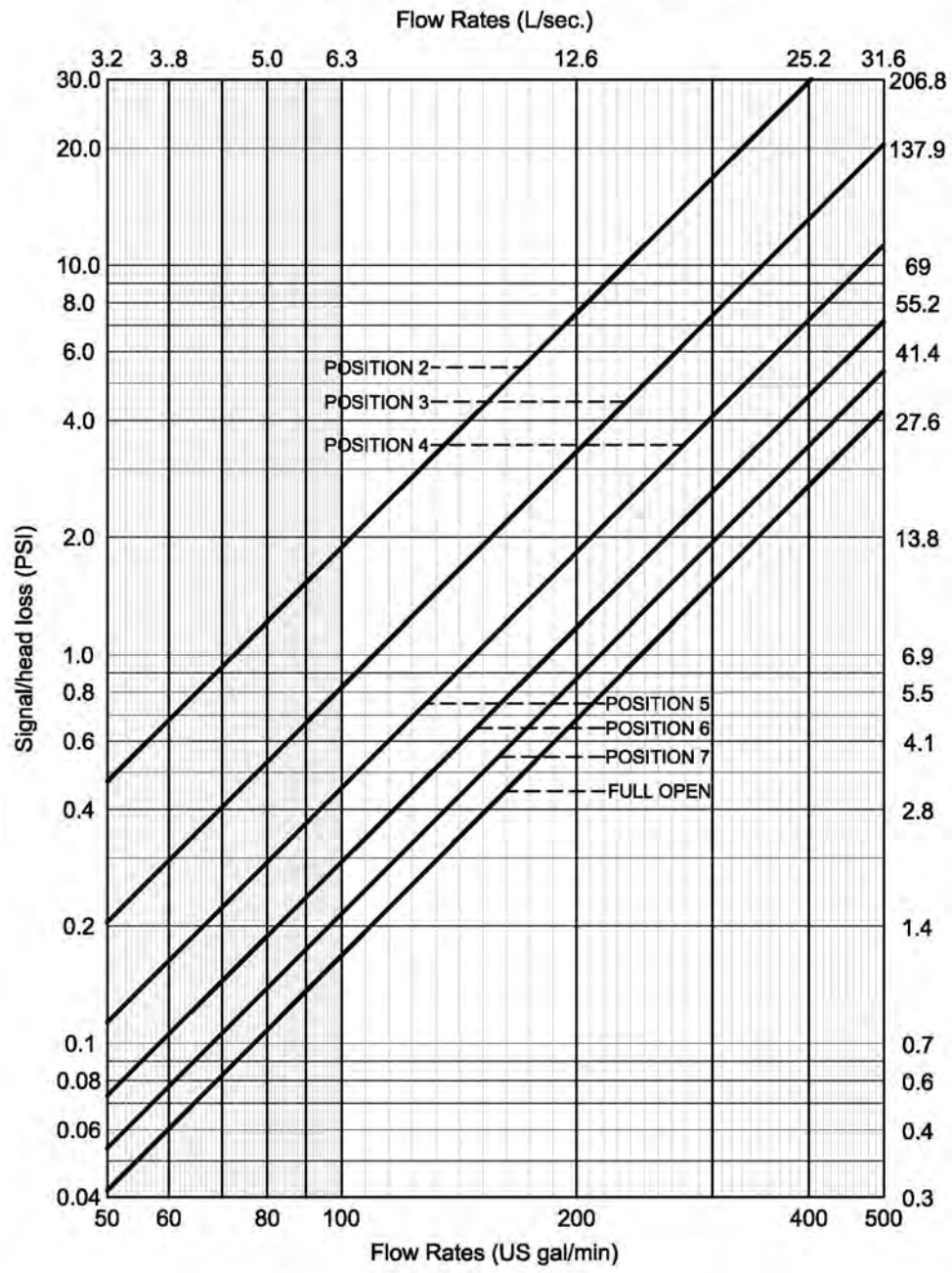
DN 80 3" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

DN100 4" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)

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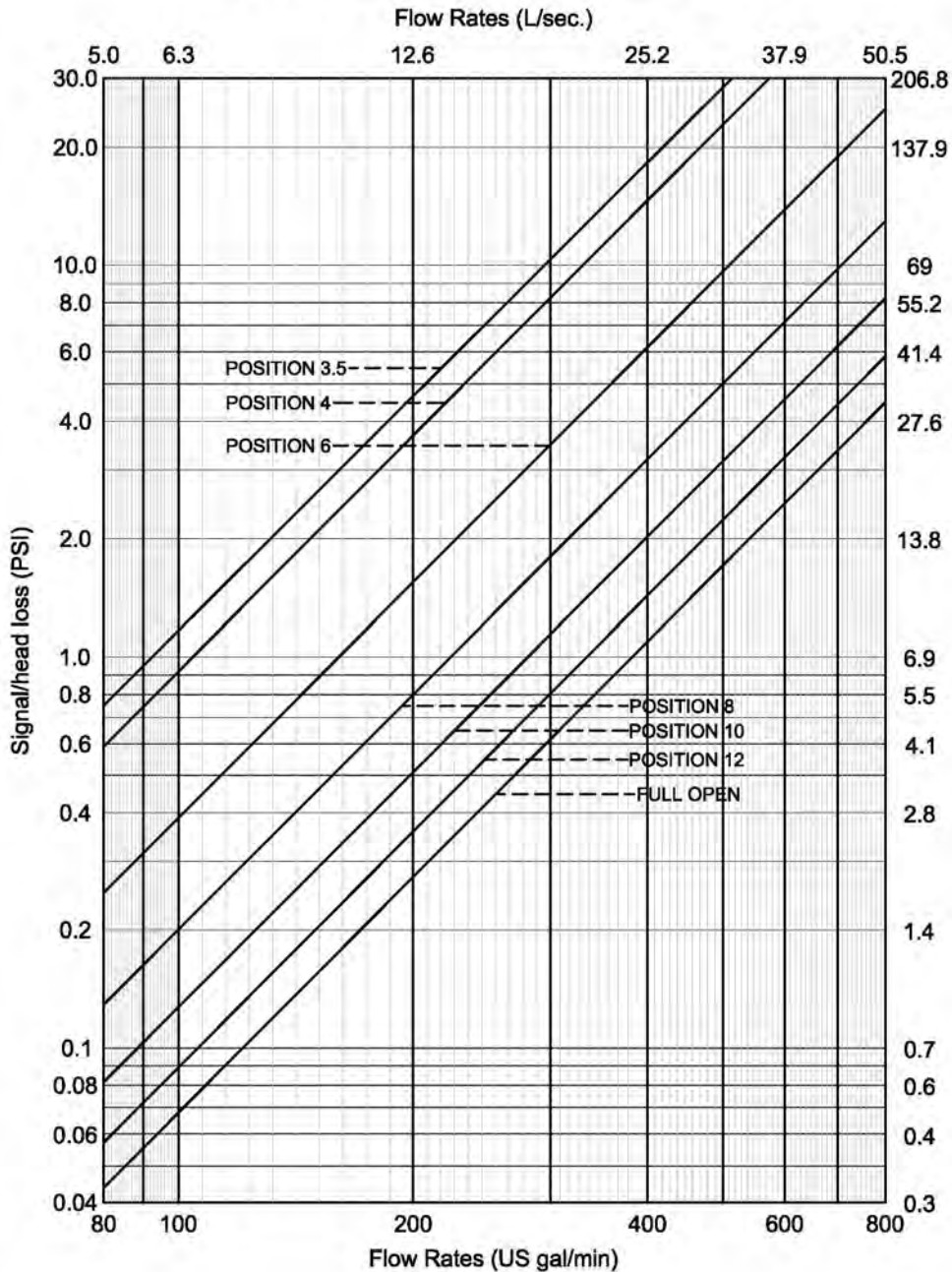


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
Velocity based on average inside diameter of Schedule 40 pipe.



DN 125 5" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)

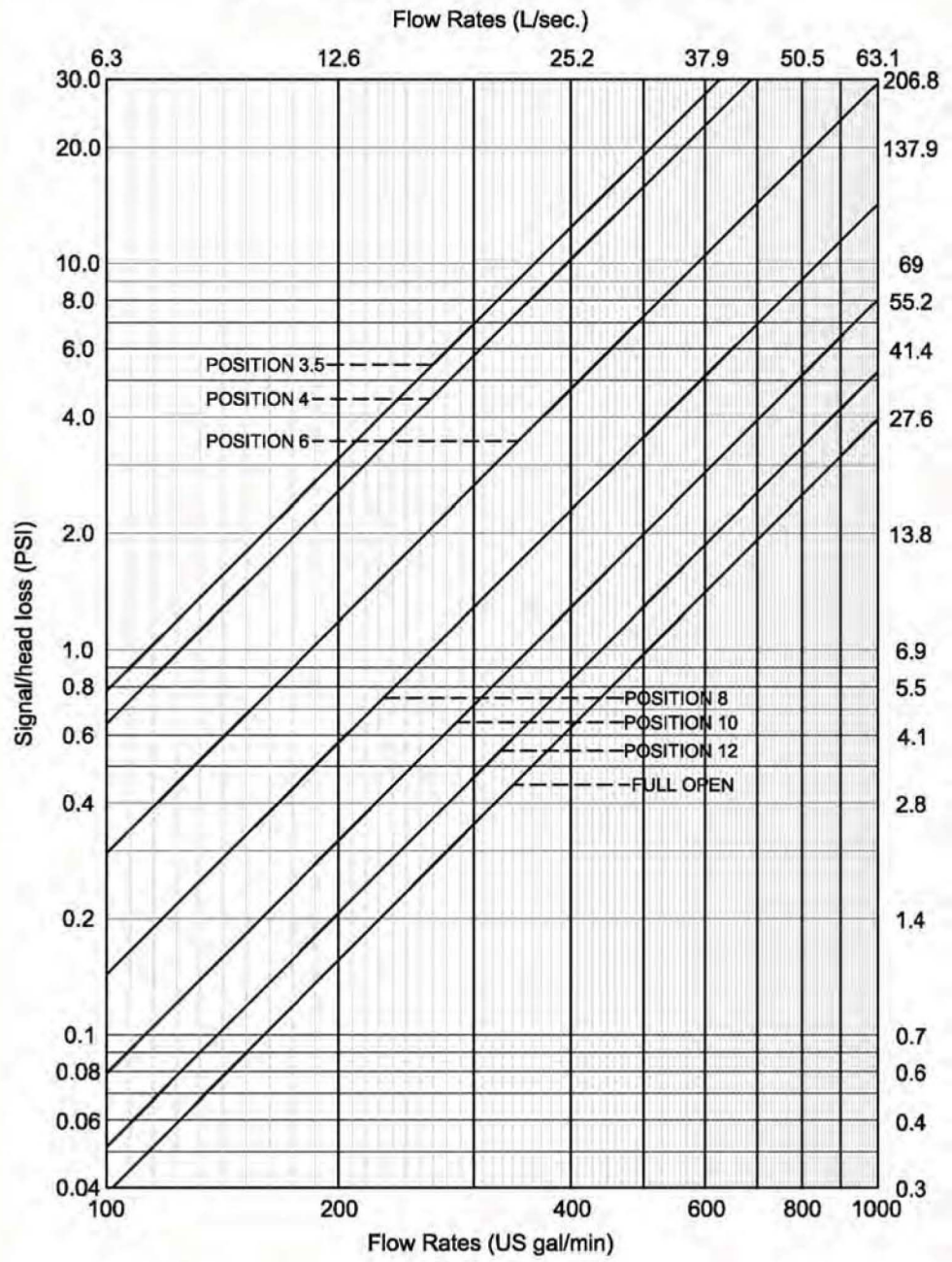
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Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
Velocity based on average inside diameter of Schedule 40 pipe.

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 ISSUE DATE: MAY 2008
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DN 150 6" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)

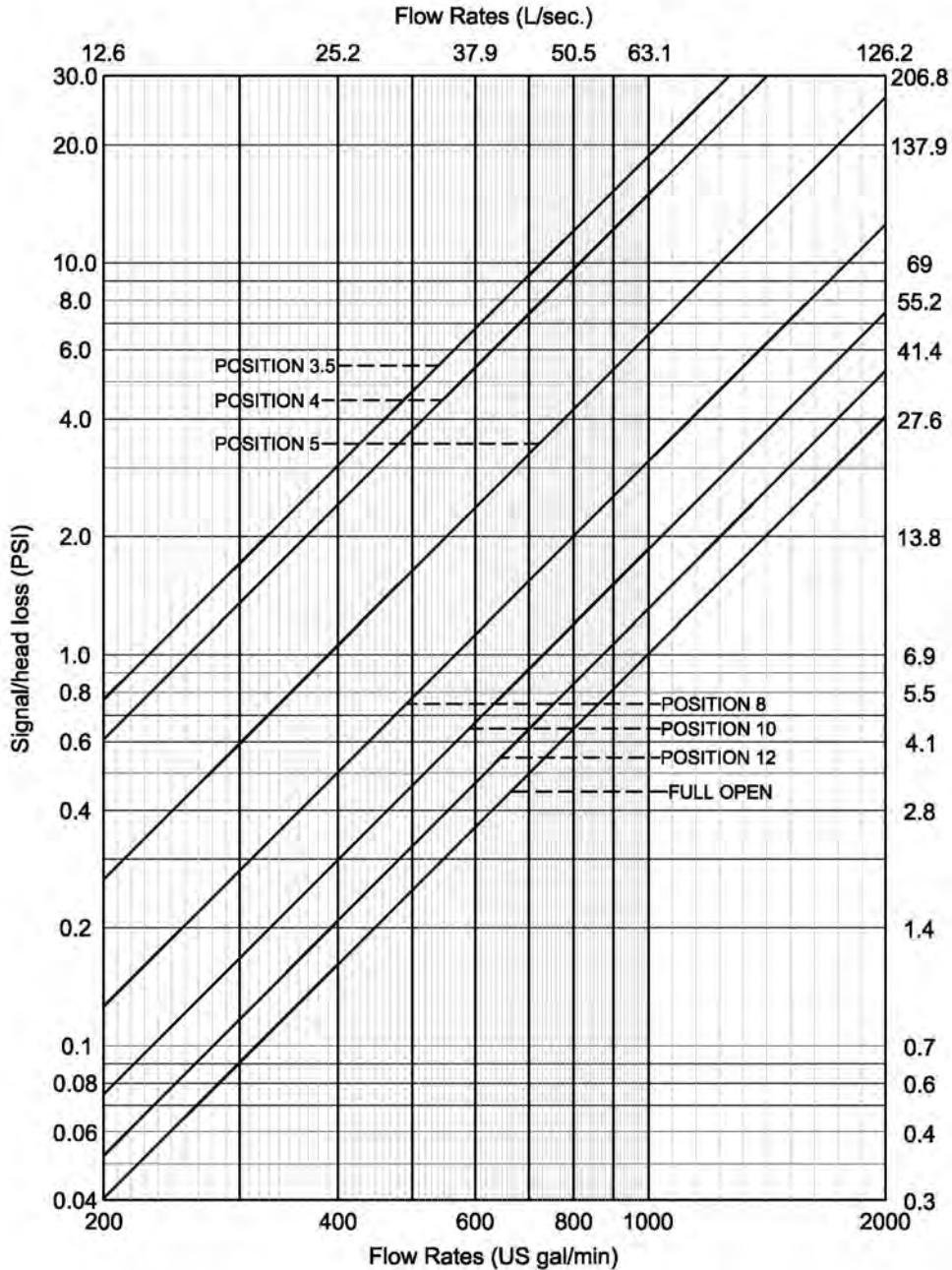


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.



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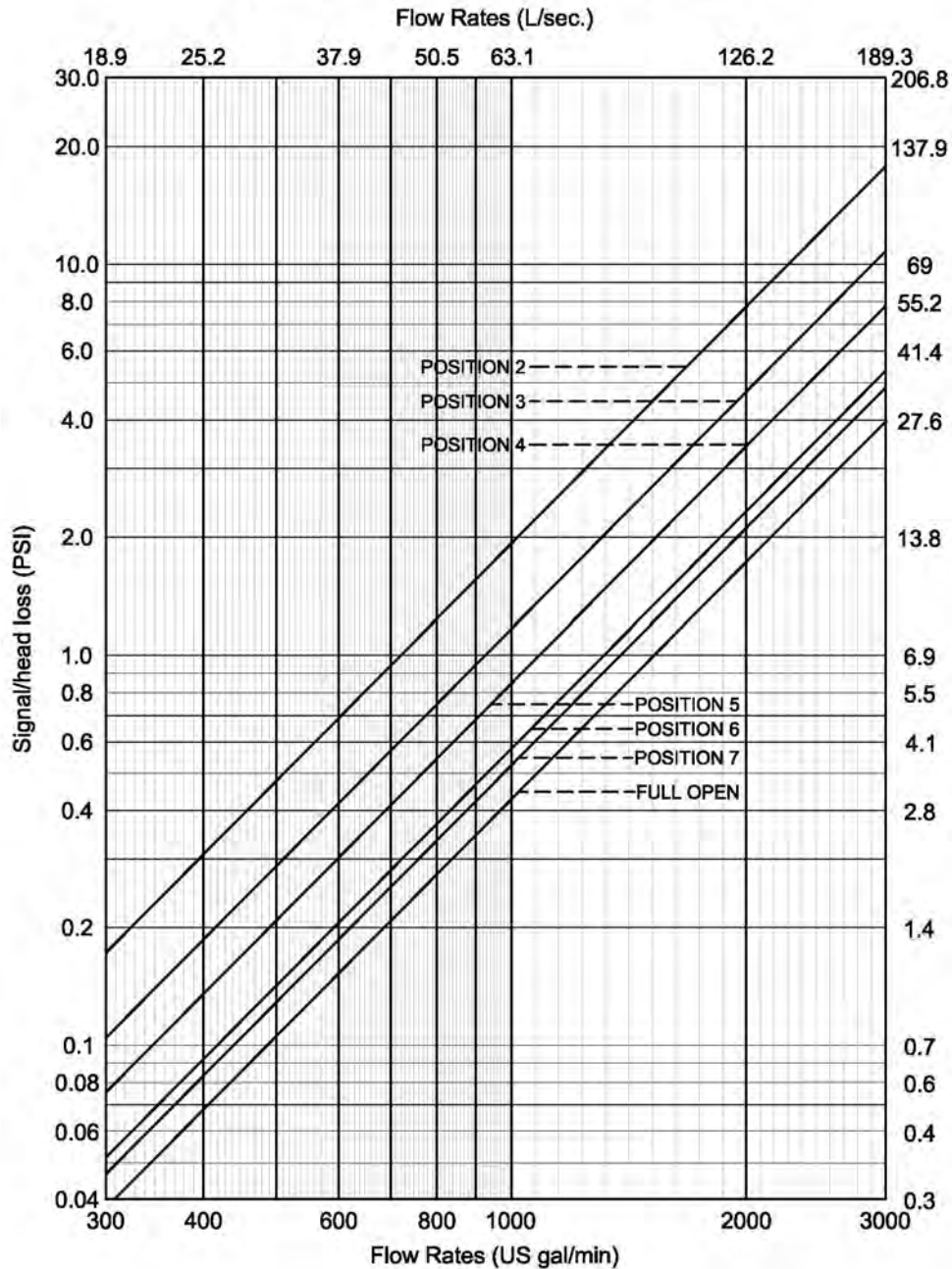
DN 200 8" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

DN 250 10" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)

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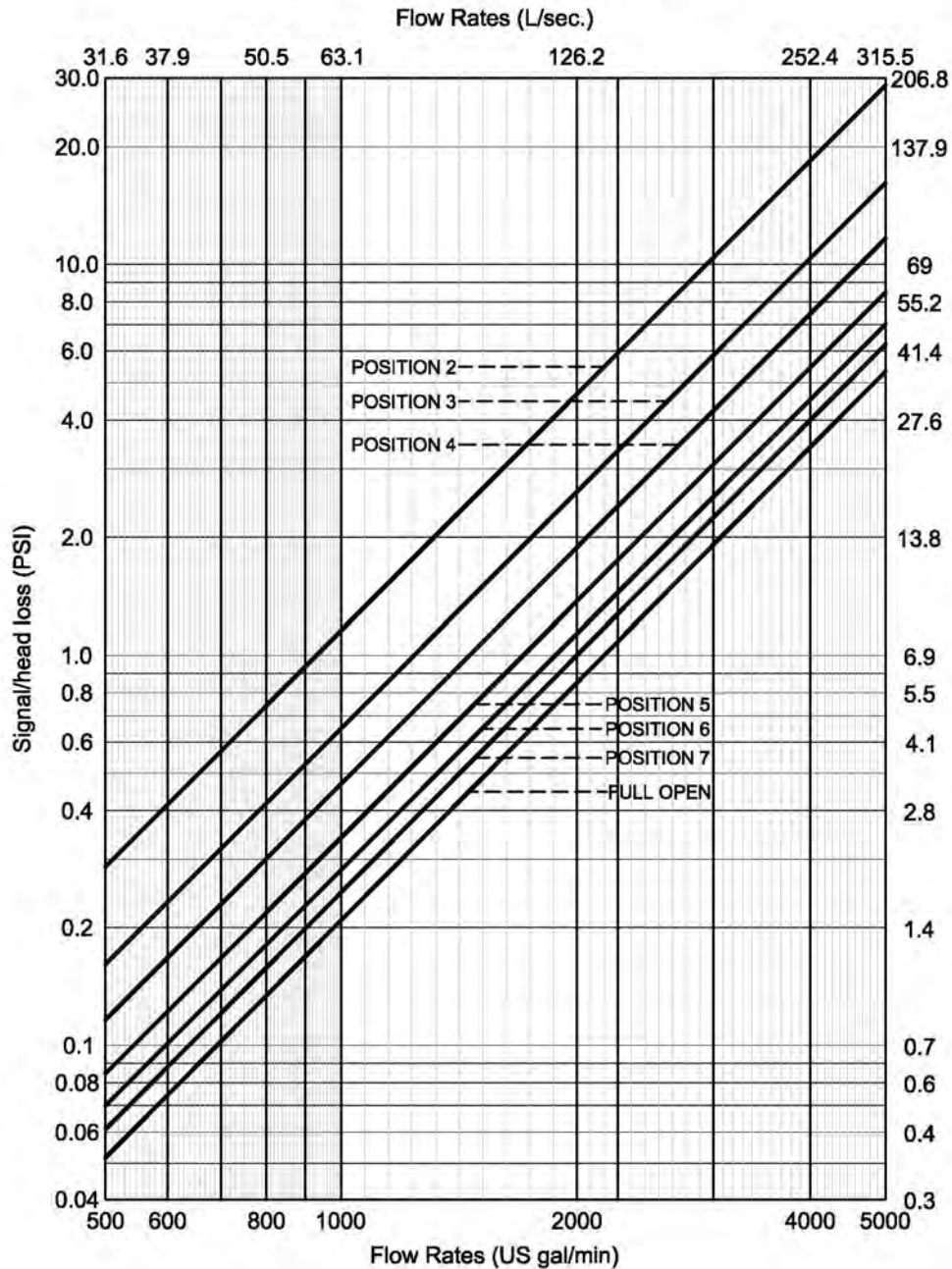


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
Velocity based on average inside diameter of Schedule 40 pipe.



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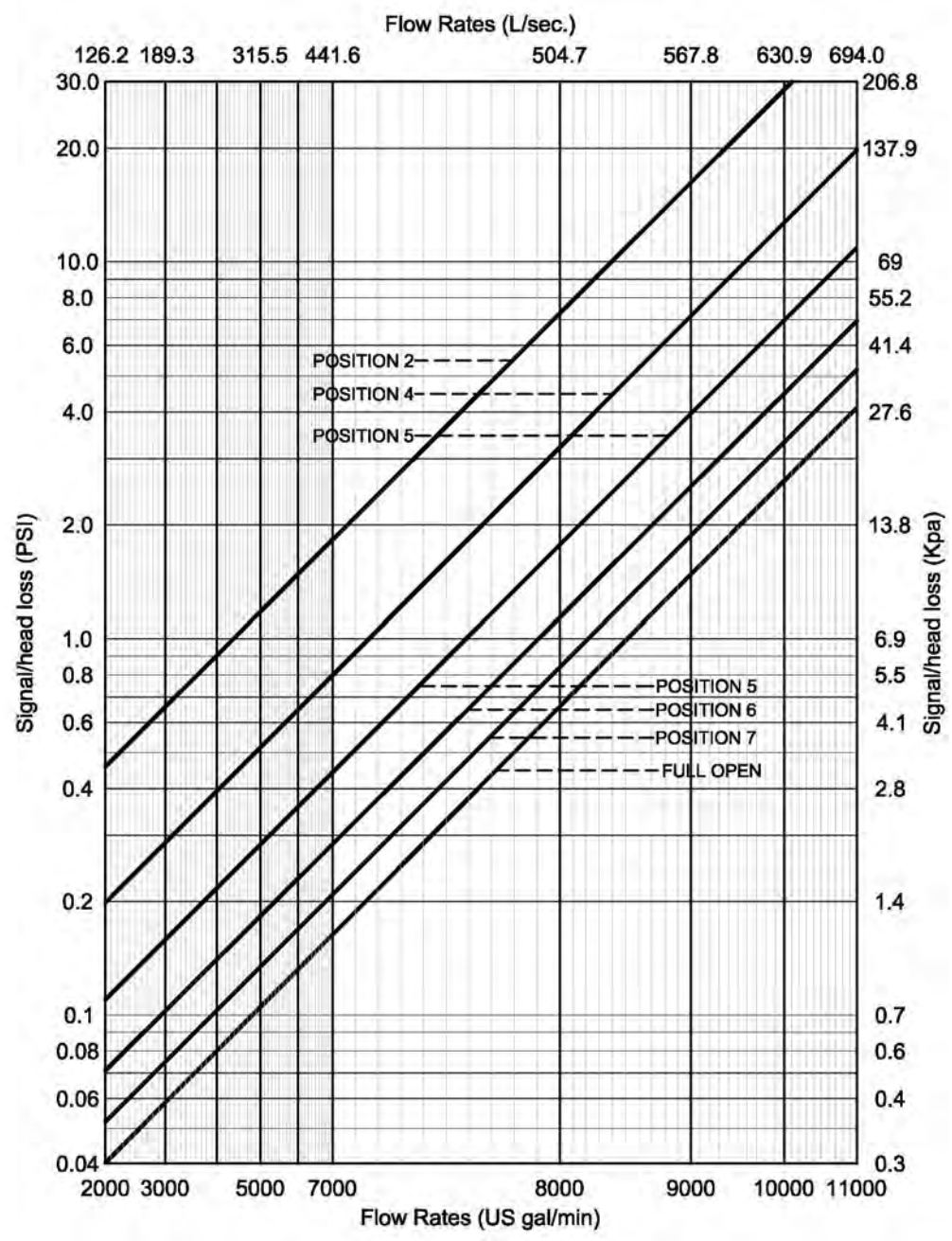
DN 300 12" BALANCING VALVE "LGS" FLOW DIAGRAM (FLANGED & GROOVED)



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

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DN 400 16" BALANCING VALVE "LGS" FLOW DIAGRAM

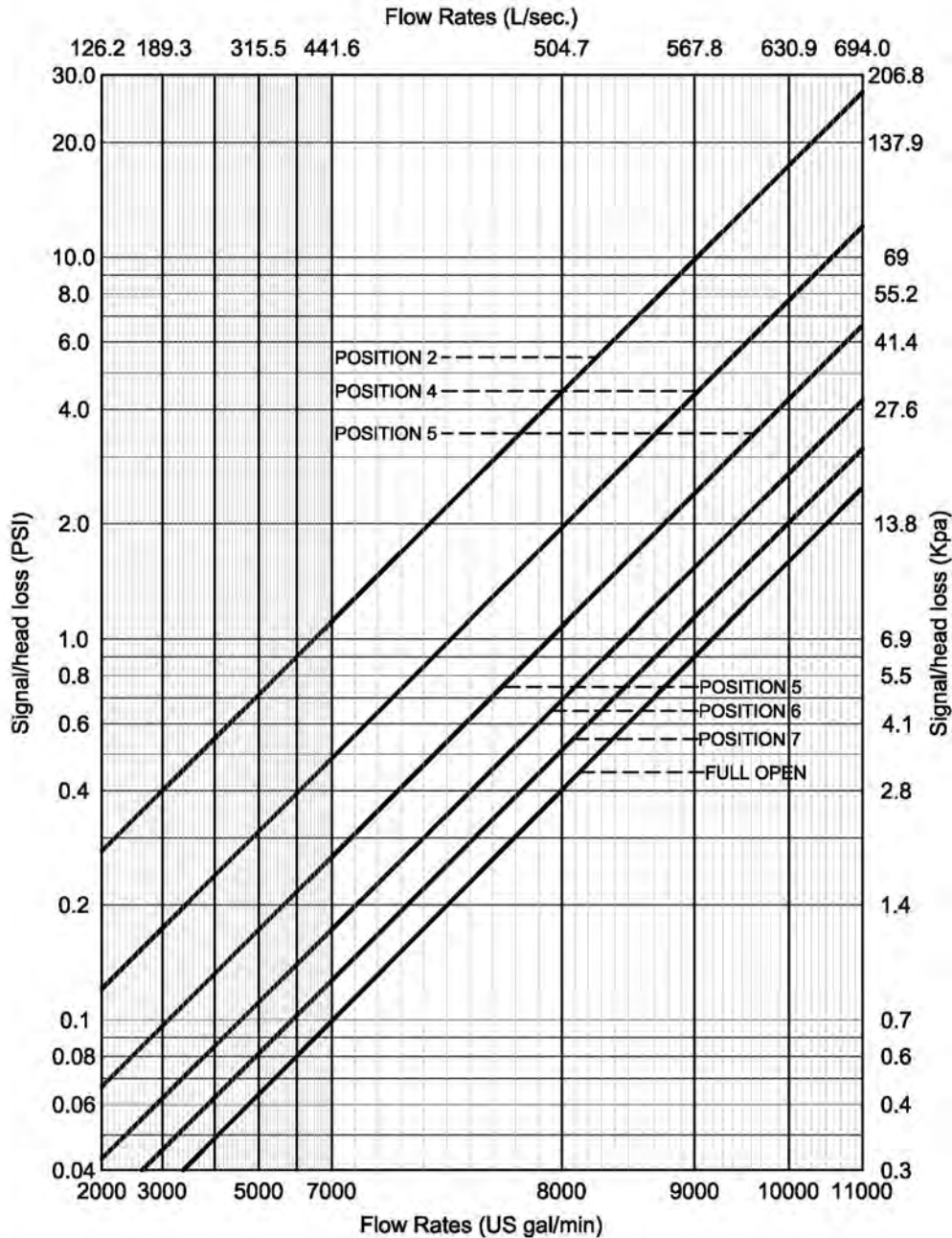


Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.



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DN 450 18" BALANCING VALVE "LGS" FLOW DIAGRAM



Graph of signal/Head Loss against Flow Rate indicating pressure drop attributable to the valve installed in a circuit.
 Velocity based on average inside diameter of Schedule 40 pipe.

Balancing Procedures for Series LGS

Balancing The System

1) Read Pumps

With all valves open read system flow at pump(s) and compare to the total design flow of all connected devices. If the flow is less verify that it is within the range of the intended diversity. If flow is more than 20% above design, adjust discharge of pump to + 20% maximum.

2) Read Risers

Read the flow of all risers and/or secondary pump loops to identify the riser/loop having the highest proportion of actual to design flow. This is the riser with the lowest installed pressure drop and will be the first balanced. Any risers or secondary pump loops that are more than 20% above design flow should be adjusted to + 20% maximum.

3) Read branches on selected riser

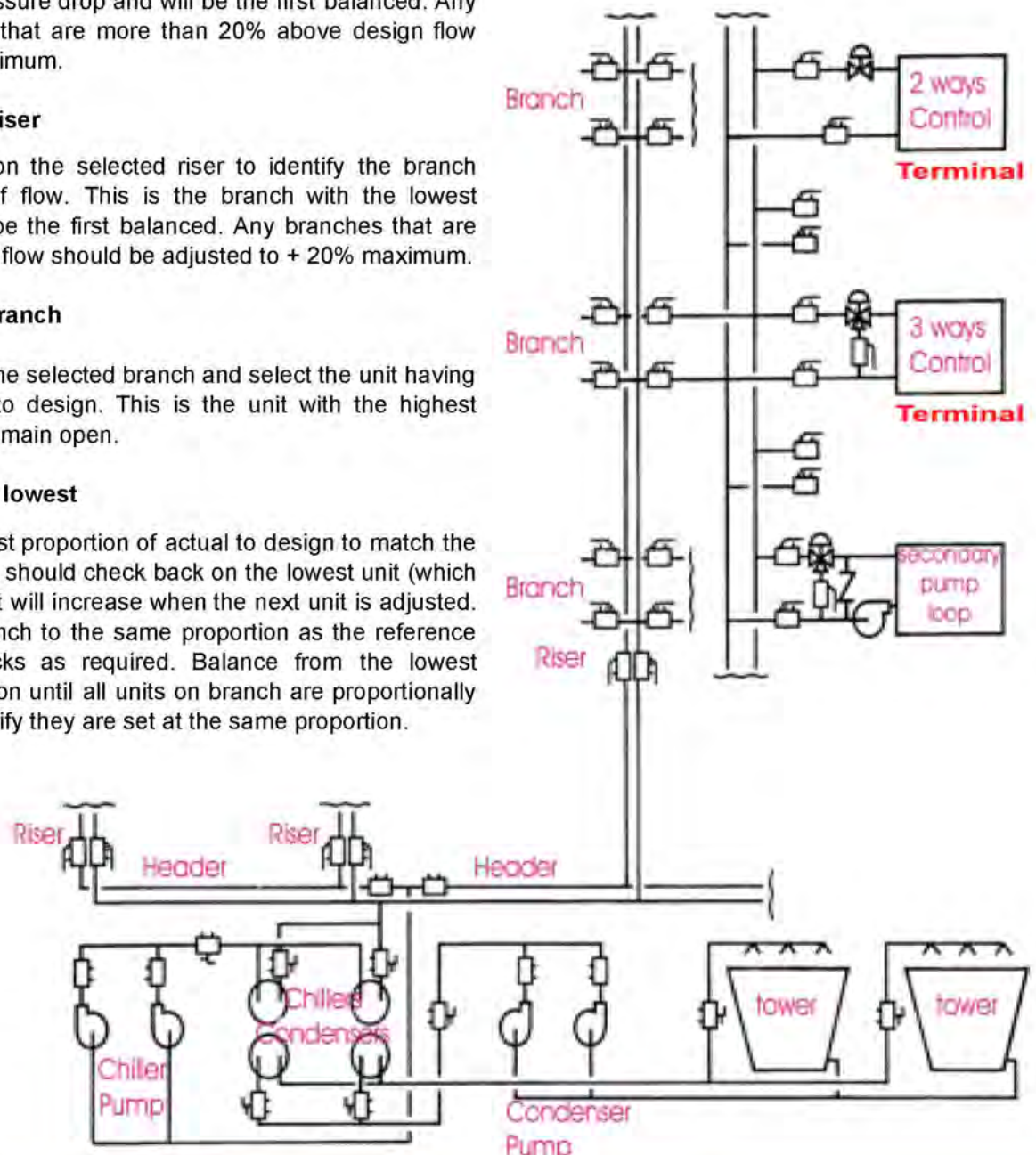
Read the flow of all branches on the selected riser to identify the branch having the highest proportion of flow. This is the branch with the lowest installed pressure drop and will be the first balanced. Any branches that are more than 20% above the design flow should be adjusted to + 20% maximum.

4) Read the units on selected branch

Read the flow of all the units on the selected branch and select the unit having the lowest proportion of actual to design. This is the unit with the highest installed pressure drop and will remain open.

5) Adjust units to proportion of lowest

Adjust the unit with the next lowest proportion of actual to design to match the proportion of the lowest unit. You should check back on the lowest unit (which becomes the reference unit), as it will increase when the next unit is adjusted. Adjust all other units on this branch to the same proportion as the reference unit with appropriate check-backs as required. Balance from the lowest proportion to the highest proportion until all units on branch are proportionally balanced. Readout all units to verify they are set at the same proportion.



6) Adjust units on all branches from lowest to highest

The next set of units balanced will be on the branch with the next lowest proportion of flow. Continue from lowest to highest, balancing all units on each branch of selected riser using procedure in step 5.

7) Adjust branches to proportion of lowest riser now proportionally balanced

(Repeat step 4 thru 7 for all risers)

Find the branch with the lowest proportion (this branch will remain open), and then balance all the other branches to the reference branch. The riser is now proportionally balanced. Repeat step 4 thru 7 for all risers until the units and branches on each are proportionally balanced.

8) Adjust risers to proportion of lowest

Select the riser with the lowest proportion (this riser will remain open). Set the next lowest riser to the same proportion as the reference riser and proceed until all risers are proportionally balanced.

9) Adjust headers to proportion of lowest

If system has multiple headers, identify the one having the lowest proportion (leave open) and set the next lowest proportional header to match. Adjust each header accordingly. System is now proportionally balanced and contains one open flow path from headers to risers to branches to terminals having the lowest pressure drop possible. Readout all terminals and fine tune any out range devices, set memory stops, and record final readings. The final flow adjustment takes place at the pump and the method of achieving design flow is the subject of the section titled "Energy Efficiency In Balancing".

10) Adjust chillers to proportion of lowest

11) Adjust condensers to proportion of lowest

12) Adjust towers to proportion of lowest

13) Adjust flow at pump

(Method described in "Energy Efficiency In Balancing")

Energy Efficiency In Balancing

The design flow rate may be obtained by throttling the pump, trimming the impeller, changing the pump or reducing the pump speed. The simplest and least costly of these options is to throttle the pump, producing balanced design condition and saving a few horsepower. It is also possible to operate the system at design flow rate with actual system pressure drop. This operation can be obtained by trimming the pump impeller to approximately 10.5" or reducing the pump speed using a variable speed device. Trimming the pump impeller is the lowest cost method of obtaining this operating point, but once trimmed, the impeller offers no capability of producing additional flow should condition warrant. A variable speed pump can match future load conditions, but imposes an additional penalty of the inefficiency of the drive on the system, thus making it a poor choice if this is all the drive is designed to accomplish. Systems having variable flow characteristics (modulating valves) can utilize variable speed drives to a substantial cost advantage taking into account the building diversity, etc.



ENGINEERS TYPICAL SPECIFICATION FOR BALANCING VALVES

.1 General

Supply and install balancing valves as shown on the drawings and manufactured by Flo Fab or approved alternate.

All balancing valves supplied shall be by the same manufacturer. By definition, a balancing valve shall have the following capabilities:

To adjust the water flow to the calculated values to ensure each terminal receives it's design required flow of water.

To act as a shut-off valve in order to save space and installation cost. This implies a tight shut-off feature and a mechanical memory of the valve setting for balancing purposes.

To act as a diagnostic tool by checking the actual water flow in the plant and to detect pump malfunctions, dirt in coils, etc.

Balancing valves are of globe-style, and are provided with integral measuring nipples for measuring the differential pressure and thereby the flow through the balancing valve. Measuring nipples feature self-sealing construction for insertion type pressure or temperature probes.

All moving parts in contact with the water shall be made with a special dezincification resistant alloy with a Brinnell hardness of at least 120. The balancing valve must have a tight shut-off function with a hidden memory of the balancing position.

Series LGS ½" to 2" NPT

Body shall be made in a dezincification resistant alloy and designed for a working pressure of at least 300 PSI (2068 Kpa) at 120oC (250oF). Setting position is obtained with 10 turn of the hand-wheel from the shut position to the fully open position. Precision is +/- 2%.

Series LGSS ½" to 2" Sweat c x c

Body shall be made in a dezincification resistant alloy and designed for a working pressure of at least 300 PSI (2068 Kpa) at 120oC (250oF). Setting position is obtained with 10 turn of the hand-wheel from the shut position to the fully open position. Precision is +/- 2%.

Series LGS 2½" to 6" flanged connections Body, complete with integral flanged, 2½" to 6" shall be made of cast iron with epoxy resin coating and 8" to 12" shall be made of ductile iron, and they are all designed for a working pressure of at least 300 PSI (2068 Kpa) at 120oC (250oF). Setting position from shut position to full open position is obtained with 10 turns of the hand-wheel. Precision is +/- 2%.

Series LGSG 2½" to 12" grooved connections Body, complete with grooved Class 125 and, shall be made of cast iron with epoxy resin coating and designed for a working pressure of at least 300 PSI (2068 Kpa) at 120oC (250oF). Setting position from shut position to full open position is obtained with 10 turns of the hand-wheel. Precision is +/- 2%.

.2 Valve selection

Balancing valves are selected in such a way that at design flow and the specified pressure drop the setting is situated between 50 and 80% of the total opening.

In all cases, for the design water flow, the pressure drop in the balancing valve fully open is at least equal to two feet of water.

Meter selection

.1

Supply a portable differential diaphragm type meter FLO FAB model _____ (choose the meter model).

The meter used to balance the system shall have the characteristics of all the balancing valves to be used in the project. It shall display directly the water flow with the need of a graph or a table. The METER consists of one or two gauges 2 1/2" diameter and is available in two ranges (1 gauge 0-60 feet model MD60) (2 gauges 0-60' / 0-135" model MD60/135). It is furnished complete with an ABS carrying case, measuring hoses and measuring probes

Supply a portable electronic type meter FLO FAB model EM-700

The meter used to balance the system shall have the characteristics of all the balancing valves to be used in the project. It shall display directly the water flow with the need of a graph or a table. The METER consists of electronic display differential pressure or directly units in USGPM or L/S It is furnished complete with and carrying case, measuring hoses and measuring probes.

.3 Installation

Always install the valve while having the arrow on the body in the direction of the flow. In order to avoid turbulence, which will affect the measurement accuracy, it is recommended to have a straight length of pipe up and down stream of the valve 10D (instead of 5) is recommended for pumps (D = diameter of pipe). The turbulence, if our recommendations are not a adhered to, can influence the flow up to 20%.

The system shall be bala nced by a qualified balancing contractor using the compensated method and balancing instrument. A balancing report shall be submitted to the engineer showing the following data as a minimum.

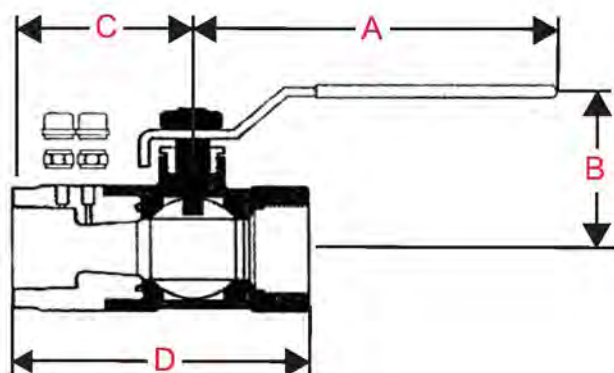
Manual Venturi Series LAS

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Large diameter plated ball, teflon seats, blowout proof stem, teflon packing and packing nut, full size handle with vinyl grip and adjustable memory stop. Available with threaded (FT) connections. Flow-lock memory stop allows shut-off and resetting. Access (Schrader type) ports are standard, temperature/pressure port optional.

SPECIFICATIONS

Body Material: Bronze and Brass
 Maximum Working Pressure: 400 PSI (2758.4 kPa)
 Maximum Working Temperature: 250oF (121oC)
 Accuracy: +/- 3%



NOTE

- 1 Recommended flow range based on 24" to 240" flow signal (D.P.)
 - 2 Full flow range based on 5" to 500" flow signal (D.P.)
 - 3 Cv's are not to be used for flow measurement. Use flow curve.
 Use Cv to calculate permanent pressure drop
- Straight pipe inlet requirements built in to product and rating (+/- 3%)
 Additional Straight pipe is not required.
 Weight based on FT x FT connections

NOMINAL DIMENSIONS

Models	Diameter	Connection Valve	Recom. Flow Range	Full Flow Range	Cv	A	B	C	D	Weight
LASUL0050	1/2" 15 mm	FPT	0.2 - 0.7	0.1 - 1	0.8	2 ⁵ / ₁₆ " 73.66 mm	1 ⁷ / ₁₆ " 40.64 mm	2 ³ / ₈ " 60.96 mm	3 ¹ / ₁₆ " 93.98 mm	1.22 lbs 0.55 kg
LASL0050	1/2" 15 mm	FPT	0.5 - 1.8	0.25 - 2.5	1.25	2 ⁵ / ₁₆ " 73.66 mm	1 ⁷ / ₁₆ " 40.64 mm	2 ³ / ₈ " 60.96 mm	3 ¹ / ₁₆ " 93.98 mm	1.22 lbs 0.55 kg
LASH0050	1/2" 15 mm	FPT	1.4 - 4.7	0.6 - 6	4.0	2 ⁵ / ₁₆ " 73.66 mm	1 ⁷ / ₁₆ " 40.64 mm	2 ³ / ₈ " 60.96 mm	3 ¹ / ₁₆ " 93.98 mm	1.22 lbs 0.55 kg
LASL0075	3/4" 20 mm	FPT	1.4 - 4.7	0.6 - 6	4.0	3 ¹⁵ / ₁₆ " 99.06 mm	1 ¹⁵ / ₁₆ " 48.26 mm	3 ¹ / ₈ " 78.74 mm	4 ² / ₁₆ " 106.68 mm	1.88 lbs 0.85 kg
LASH0075	3/4" 20 mm	FPT	2.8 - 9.0	1.3 - 13	8	3 ¹⁵ / ₁₆ " 99.06 mm	1 ¹⁵ / ₁₆ " 48.26 mm	3 ¹ / ₈ " 78.74 mm	4 ⁵ / ₁₆ " 109.22 mm	1.88 lbs 0.85 kg
LAS0100	1" 25 mm	FPT	4.2 - 13	1.9 - 19	12	4 ⁷ / ₈ " 121.92 mm	2 ¹ / ₁₆ " 55.88 mm	3 ¹ / ₂ " 88.9 mm	5 ¹ / ₈ " 129.54 mm	2.92 lbs 1.32 kg
LAS0125	1 1/4" 32 mm	FPT	8.0 - 25	3.5 - 35	24	5 ¹ / ₂ " 139.7 mm	2 ¹ / ₂ " 63.5 mm	4 ¹ / ₈ " 104.14 mm	5 ¹¹ / ₁₆ " 144.78 mm	5.34 lbs 2.42 kg
LAS0150	1 1/2" 40 mm	FPT	12 - 39	5.5 - 55	46	5 ¹ / ₂ " 139.7 mm	2 ¹ / ₂ " 63.5 mm	4 ³ / ₈ " 111.76 mm	6 ⁵ / ₁₆ " 160.02 mm	7.40 lbs 3.36 kg
LAS0200	2" 50 mm	FPT	23 - 75	10 - 100	72	5 ¹ / ₂ " 139.7 mm	2 ¹⁵ / ₁₆ " 73.66 mm	4 ¹⁵ / ₁₆ " 124.46 mm	7 ¹ / ₈ " 180.34 mm	11.50 lbs 5.22 kg

Dimensions are subject to change without notice.

Dimensions not to be used for construction unless prints is certified by factory.

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Manual Venturi Series LAS

MODEL DESIGNATION	OPTIONS
<p>LASL0075 - FT/FT - DP3&9</p> <p>Model/Diameter Ex: 3/4" (18.75mm) Low Flow</p> <p>Connections Ball valve end first. See specifications for available connections. Ex: Female Thread x Female Thread</p>	<p>Options For options that requires specified locations Ex: DP @ 3:00 & 9:00</p> <p>DP= Dual P/T ports (Instead of standard port) DX= Dual XL P/T port (Instead of standard port) UL= Ultra Low flow range L= Low flow range H= High flow range FT= Female Thread</p>

DIFFERENTIAL PRESSURE: Kpa and Inches Water Cube (in)

Flow	Models												
	050UL		050L		050H 075L		075H		100		125		
L/s	GPM	Kpa	In	Kpa	In	Kpa	In	Kpa	In	Kpa	In	Kpa	In
0	0.1	0.75	3										
0.01	0.2	2.5	10										
0.01	0.3	5.5	22										
0.02	0.4	10	40	3	12								
0.03	0.5	15.5	62	4.75	19								
0.03	0.6	22.25	89	6.75	27								
0.04	0.7	30.25	121	9.25	37								
0.05	0.8	39.5	158	12	48								
0.05	0.9	50	200	15.25	61								
0.06	1.0	61.75	247	18.5	74	3	12						
0.06	1.1	74.75	299	22.75	91	3.75	15						
0.07	1.2	89	356	27	108	4.25	17						
0.08	1.3	104.5	418	31.75	127	5	20						
0.08	1.4	121	484	36.75	147	6	24						
0.09	1.5			42.25	169	6.75	27						
0.10	1.6			48	192	7.75	31						
0.10	1.7			54.25	217	8.75	35						
0.11	1.8			60.5	242	9.5	38						
0.11	1.9			67.75	271	10.75	43						
0.12	2.0			74.75	299	12	48	3	12				
0.13	2.2			90.5	362	14.5	58	3.5	14				
0.15	2.4			107.75	431	17.25	69	4.25	17				
0.16	2.6					20.25	81	5	20				
0.17	2.8					23.5	94	5.75	23				
0.18	3.0					27	108	6.75	27	3	12		
0.20	3.2					30.75	123	7.75	31	3.5	14		
0.21	3.4					34.75	139	8.75	35	3.75	15		
0.22	3.5					36.75	147	9.25	37	4	16		
0.22	3.6					39	156	9.75	39	4.25	17		
0.23	3.8					43.25	173	10.75	43	4.75	19		
0.25	4.0					48	192	12	48	5.25	21		
0.26	4.2					53	212	13.25	53	6	24		
0.27	4.4					58	232	14.5	58	6.5	26		
0.28	4.5					60.5	242	15.25	61	6.75	27		
0.29	4.6					63.5	254	15.75	63	7	28		
0.30	4.8					69	276	17.25	69	7.75	31		
0.31	5.0					74.75	299	18.75	75	8.25	33		
0.32	5.2					81	324	20.25	81	9	36		
0.34	5.4					87.5	350	21.75	87	9.75	39		
0.34	5.5					90.5	362	22.75	91	10	40	3	12
0.35	5.6					94	376	23.50	94	10.5	42	3.25	13
0.36	5.6					101	404	25.25	101	11.25	45	3.5	14
0.37	6.0					107.75	431	27	108	12	48	3.75	15
0.39	6.2					115.25	461	28.75	115	12.75	51	4	16
0.40	6.4					122.75	491	30.75	123	13.75	55	4.25	17
0.41	6.5							31.5	126	14	56	4.25	17
0.41	6.6							32.75	131	14.5	58	4.5	18
0.42	6.8							34.75	139	15.5	62	4.75	19
0.44	7.0							36.75	147	16.25	65	5	20

* The recommended ranges are shown in **bold**

Using the differential pressure (D.P.) tables

- Generally, the recommended low ΔP signal is 24" so it can be read on most HVAC instruments. D.P.'s below 12" are not accurate on some sizes.
- The upper D.P. limit is an effort to minimize the permanent pressure loss which is 10 % of the D.P. signal. Any venturi can be operated above the recommended range if the permanent pressure drop is acceptable.
- The D.P.'s in the table were calculated using the following formula:

$$D.P. = \left(\frac{GPM \cdot 17.3}{FF} \right)^2$$

Flow factors (FF) for all models are listed below.

Model	FF
0500L	1.1
050L	2
075L/050H	5
075H	10
100	15
125	27
150	42
200	80
250	135
300	225
400	480

NOTE: Permanent pressure loss equals 10% of Kpa.

Dimensions not to be used for construction unless prints is certified by factory.



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Manual Venturi Series LAS

DIFFERENTIAL PRESSURE: kPa and inches of water

Flow		Models									
		075H		100		125		150		200	
L/s	GPM	Kpa	in	Kpa	in	Kpa	in	Kpa	in	Kpa	in
0.47	7.5	42	168	18.75	75	5.75	23				
0.50	8.0	48	192	21.25	85	6.5	26				
0.53	8.5	54.25	217	24	96	7.5	30				
0.56	9.0	60.5	242	27	108	8.25	33	3.5	14		
0.59	9.5	67.75	271	30	120	9.25	37	3.75	15		
0.63	10	74.75	299	33.25	133	10.25	41	4.25	17		
0.69	11	90.5	362	40.25	161	12.5	50	5.25	21		
0.75	12	107.75	431	48	192	14.75	59	6	24		
0.82	13			56.25	225	17.25	69	7.25	29		
0.88	14			65.25	261	20	80	8.25	33		
0.94	15			74.75	299	23	92	9.5	38		
1	16			85	340	26.25	105	10.75	43	3	12
1.07	17			96	384	29.75	119	12.25	49	3.5	14
1.13	18			107.75	431	33.25	133	13.75	55	3.75	15
1.19	19			120	480	37	148	15.25	61	4.25	17
1.26	20					41	164	17	68	4.75	19
1.38	22					49.75	199	20.5	82	5.57	23
1.51	24					59	236	24.5	98	6.75	27
1.64	26					69.5	278	28.75	115	8	32
1.76	28					80.5	322	33.25	133	9.25	37
1.89	30					92.25	369	38.25	153	10.5	42
2.01	32					105	420	43.5	174	12	48
2.14	34					118.5	474	49	196	13.5	54
2.27	36							55	220	15.25	61

Flow		Models											
		075H		100		125		150		200			
L/s	GPM	Kpa	in	Kpa	in	Kpa	in	Kpa	in	Kpa	in		
2.39	38									61.25	245	17	68
2.52	40									67.75	271	18.75	75
2.64	42									74.75	299	20.5	82
2.77	44									82	328	22.75	91
2.9	46									89.75	359	24.75	99
3.02	48									97.5	390	27	108
3.15	50									106	424	29.25	117
3.28	52									114.5	458	31.5	126
3.40	54									123.5	494	34	136
3.53	56											36.75	147
3.65	58											39.25	157
3.78	60											42	168
4.03	64											48	192
4.28	68											54	216
4.41	70											57.25	229
4.73	75											65.75	263
5.04	80											74.75	299
5.36	85											84.5	338
5.67	90											94.75	379
5.99	95											105.5	422
6.3	100											116.75	467
6.62	105												
6.93	110												
7.25	115												

Dimensions not to be used for construction unless prints is certified by factory.

Manual Venturi with Butterfly Valve Series LAW-LAG-LAF

Available in sizes 2" (50 mm) through 14" (350 mm)

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SPECIFICATION

Venturi

Steel ASTM A120 Steel ASTM A120
Instrument Valves: 1/4" (6.25 mm)
 Schrader Type Access Valve with Cap

Design: Low Loss, Piezo-Ring Throat

Butterfly Valve

Body Material: Cast Iron Lug Type body ANSI 125/150
Seat and Gasket: EPDM
Stem: 416 SS
Bearings: Bronze Sleeve
Disc: 304 Stainless Steel

Maximum Working Pressure: 240 PSI (1655 kPa)
Maximum Working Temperature: 250oF (121oC)

The use a low-loss venturi to obtain a measurement accuracy of +/- 3% FS. The venturi and downstream butterfly valve have been matched and labotary tested to verify the accuracy. The butterfly valve has 2" (50mm) extended neck above the flange for insulation. The valve handle has an infinite position memory stop 2" to 6" (50mm to 150mm) and a gear operator 8" to 14" (200mm to 350mm). The entire assembly has a five year warranty. The total pressure drop added to the pump head seldom exceeds one foot.

Flow measurement can be obtained with a differential pressure meter reading across the venturi taps.

The design flow can be obtained by adjusting the valve operator until the desired USGPM is reached. The set handle position is maintained by using the memory stop.



Model LAW

The LAW includes a weld-end venturi on the inlet with a lug type butterfly valve mounted to the downstream venturi flange and #150 welded-end flange mounted to Pressure access ports are standard.

* Field installation requires no additional material.

Model LAG

The LAG includes a grooved venturi on the inlet with a lug type butterfly valve mounted to the downstream outlet and #150 grooved flange adapter, supplied loose, for attachment to the butterfly valve. Pressure access ports

* Field installation requires one standard grooved coupling for the upstream attachment.

Model LAF

The LAF includes a #150 flanged-end venturi with a butterfly valve mounted to the downstream side. Pressure access ports are standard.

* Field installation requires two #150 mating flanges, nuts and bolts. Cap screws to mate with the butterfly



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Manual Venturi with Butterfly Valve Series LAW-LAG-LAF

MODEL DESIGNATION

Model/Diameter **Flow Range**
 Ex: 4" (100mm) LAG Ex: Low flow range

LAGL0400 - DP **Options**
 For options that requires specified locations
 Ex: DP

L= Low flow range
H= High flow range

DP= Dual P/T ports
 (Instead of standard port)

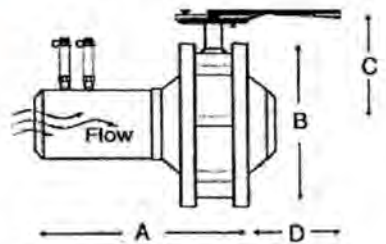
DX= Dual XL P/T port
 (Instead of standard port)

NOMINAL DIMENSIONS

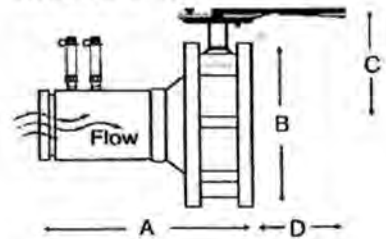
Models	Diameter	Connection	A	B	C	D	Weight
LAW_0200	2" 50 mm	Weld Ends	10 ¹¹ / ₁₆ " 272.5 mm	6" 150 mm	6 ⁹ / ₁₆ " 165 mm	7 ³ / ₁₆ " 180 mm	23 lbs 10.4 kg
LAG_0200	2" 50 mm	Grooved	9 ¹ / ₈ " 227.5 mm	6" 150 mm	6 ⁹ / ₁₆ " 165 mm	9" 225 mm	20 lbs 9 kg
LAF_0200	2" 50 mm	150 Flange	10 ⁷ / ₈ " 270 mm	6" 150 mm	6 ⁹ / ₁₆ " 165 mm	9 ¹¹ / ₁₆ " 242.5 mm	23 lbs 10.4 kg
LAW_0250	2 ¹ / ₂ " 65 mm	Weld Ends	11 ³ / ₈ " 285 mm	7" 175 mm	7 ³ / ₁₆ " 180 mm	7" 175 mm	33 lbs 14.9 kg
LAG_0250	2 ¹ / ₂ " 65 mm	Grooved	9 ¹ / ₂ " 237.5 mm	7" 175 mm	7 ³ / ₁₆ " 180 mm	8 ⁷ / ₈ " 220 mm	28 lbs 12.7 kg
LAF_0250	2 ¹ / ₂ " 65 mm	150 Flange	11 ⁵ / ₁₆ " 282.5 mm	7" 175 mm	7 ³ / ₁₆ " 180 mm	9 ¹ / ₁₆ " 242.5 mm	33 lbs 14.9 kg
LAW_0300	3" 80 mm	Weld Ends	12 ⁵ / ₈ " 310 mm	7 ¹ / ₂ " 187.5 mm	7 ⁹ / ₁₆ " 190 mm	7" 175 mm	38 lbs 17.2 kg
LAG_0300	3" 80 mm	Grooved	10 ¹ / ₂ " 262.5 mm	7 ¹ / ₂ " 187.5 mm	7 ⁹ / ₁₆ " 190 mm	8 ⁷ / ₈ " 220 mm	32 lbs 14.5 kg
LAF_0300	3" 80 mm	150 Flange	12 ⁵ / ₁₆ " 307.5 mm	7 ¹ / ₂ " 187.5 mm	7 ⁹ / ₁₆ " 190 mm	9 ¹¹ / ₁₆ " 242.5 mm	38 lbs 17.2 kg
LAW_0400	4" 100 mm	Weld Ends	13 ⁷ / ₈ " 345 mm	9" 225 mm	8 ³ / ₈ " 210 mm	6 ³ / ₈ " 155 mm	59 lbs 26.7 kg
LAG_0400	4" 100 mm	Grooved	11 ¹¹ / ₁₆ " 297.5 mm	9" 225 mm	8 ³ / ₈ " 210 mm	8 ¹ / ₂ " 212.5 mm	50 lbs 22.7 kg
LAF_0400	4" 100 mm	150 Flange	13 ¹¹ / ₁₆ " 347.5 mm	9" 225 mm	8 ³ / ₈ " 210 mm	9 ³ / ₈ " 235 mm	59 lbs 26.7 kg
LAW_0500	5" 125 mm	Weld Ends	15 ¹ / ₂ " 387.5 mm	10" 250 mm	9" 225 mm	5 ⁵ / ₁₆ " 147.5 mm	74 lbs 33.6 kg
LAG_0500	5" 125 mm	Grooved	12 ⁵ / ₁₆ " 322.5 mm	10" 250 mm	9" 225 mm	8 ¹ / ₂ " 212.5 mm	62 lbs 28.1 kg
LAF_0500	5" 125 mm	150 Flange	15 ⁵ / ₈ " 385 mm	10" 250 mm	9" 225 mm	9 ³ / ₈ " 235 mm	74 lbs 33.6 kg

Dimensions are subject to change without notice.

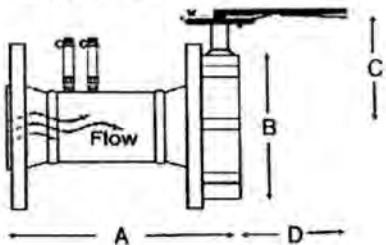
Model LAW



Model LAG



Model LAF



Manual Venturi with Butterfly Valve Series LAW-LAG-LAF

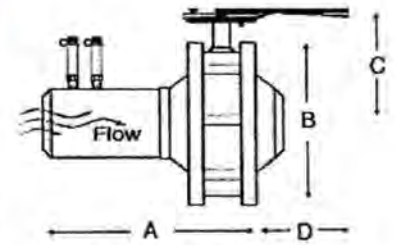
SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
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NOMINAL DIMENSIONS

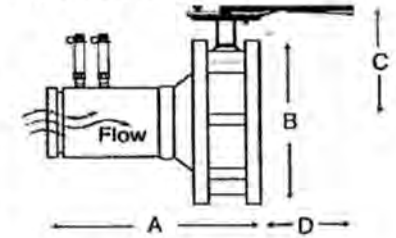
Models	Diameter	Connection	A	B	C	D	Weight
LAW_0600	6" 150 mm	Weld Ends	16 1/2" 412.5 mm	11" 275 mm	9 1/16" 242.5 mm	5 15/16" 147.5 mm	90 lbs 40.8 kg
LAG_0600	6" 150 mm	Grooved	14" 350 mm	11" 275 mm	9 1/16" 242.5 mm	8 3/8" 210 mm	74 lbs 33.6 kg
LAF_0600	6" 150 mm	150 Flange	16 3/8" 410 mm	11" 275 mm	9 1/16" 242.5 mm	9 3/8" 235 mm	90 lbs 40.8 kg
LAW_0800	8" 200 mm	Weld Ends	20 9/16" 515 mm	13 1/2" 337.5 mm	14 7/8" 352.5 mm	7 1/16" 190 mm	156 lbs 70.7 kg
LAG_0800	8" 200 mm	Grooved	17 1/16" 442.5 mm	13 1/2" 337.5 mm	14 7/8" 352.5 mm	10 3/8" 260 mm	131 lbs 59.4 kg
LAF_0800	8" 200 mm	150 Flange	20 1/2" 512.5 mm	13 1/2" 337.5 mm	14 7/8" 352.5 mm	11 9/16" 290 mm	156 lbs 70.7 kg
LAW_1000	10" 250 mm	Weld Ends	21 15/16" 547.5 mm	16" 400 mm	15 11/16" 392.5 mm	6 1/2" 162.5 mm	223 lbs 101.2 kg
LAG_1000	10" 250 mm	Grooved	19 7/8" 477.5 mm	16" 400 mm	15 11/16" 392.5 mm	9 5/16" 232.5 mm	193 lbs 87.6 kg
LAF_1000	10" 250 mm	150 Flange	21 7/8" 545 mm	16" 400 mm	15 11/16" 392.5 mm	10 1/2" 262.5 mm	223 lbs 101.2 kg
LAW_1200	12" 300 mm	Weld Ends	24 5/16" 607.5 mm	19" 475 mm	17 15/16" 447.5 mm	6 7/8" 170 mm	327 lbs 148.3 kg
LAG_1200	12" 300 mm	Grooved	21" 525 mm	19" 475 mm	17 15/16" 447.5 mm	10" 250 mm	286 lbs 129.7 kg
LAF_1200	12" 300 mm	150 Flange	24 3/16" 605 mm	19" 475 mm	17 15/16" 447.5 mm	11 5/16" 282.5 mm	327 lbs 148.3 kg
LAW_1400	14" 350 mm	Weld Ends	27 3/16" 680 mm	21" 525 mm	19 1/2" 487.5 mm	6" 150 mm	435 lbs 197.3 kg
LAG_1400	14" 350 mm	Grooved	23 9/16" 590 mm	21" 525 mm	19 1/2" 487.5 mm	9 9/16" 240 mm	396 lbs 179.6 kg
LAF_1400	14" 350 mm	150 Flange	27 7/8" 677.5 mm	21" 525 mm	19 1/2" 487.5 mm	11" 275 mm	435 lbs 197.3 kg

Dimensions are subject to change without notice.

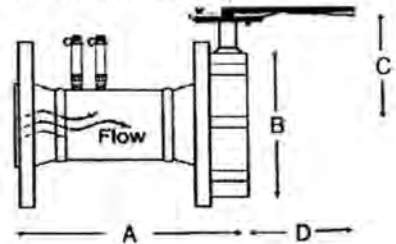
Model LAW



Model LAG



Model LAF



Dimensions not to be used for construction unless prints is certified by factory.



Manual Venturi with Butterfly Valve Series LAW-LAG-LAF

DIFFERENTIAL PRESSURE: kPa and inches of water

Flow GPM	Models									
	200L	200H	250L	250H	300L	300H	400L	400H	500L	600L
16	10									
18	13									
20	16									
22	19									
24	23									
26	27									
28	31		12							
30	36		14							
32	41	13	16							
34	46	14	18							
36	52	16	20							
38	58	18	22							
40	64	20	25							
42	70	22	27							
44	77	24	30							
46	84	26	33							
48	92	28	36							
50	100	31	39							
55	121	37	47							
60	144	44	56							
65	169	52	66	13	19					
70	196	60	76	15	22					
75	224	69	87	17	25					
80	255	79	99	20	28					
85	288	89	112	22	32					
90		100	126	25	36					
95		111	140	28	40		12			
100		123	155	31	44		14			
110		149	188	37	54	13	17			
120		177	224	44	64	15	20			
130		208	262	52	75	18	23			
140		241	304	60	87	20	27	12	12	
150		277		69	100	23	31	13	14	
160				79	114	27	35	15	16	
170				89	128	30	40	17	18	
180				100	144	34	44	19	20	
190				111	160	38	49	21	23	
200				123	178	42	55	24	25	
220				149	215	50	66	29	30	
240				178	256	60	79	34	36	12
250				193	277	65	86	37	39	13
260				208	300	70	93	40	42	14
280				242		82	107	47	49	16
300				277		94	123	54	56	18
325						110	145	63	66	22
350						127	168	73	77	25
375						146	193	84	88	29
400						166	219	95	100	33

* The recommended ranges are shown in **bold**

Using the differential pressure (D.P.) tables

- Generally, the recommended low ΔP signal is 24" so it can be read on most HVAC instruments. D.P.'s below 12" are not accurate on some sizes.
- The upper D.P. limit is an effort to minimize the permanent pressure loss which is 10 % of the D.P. signal. Any venturi can be operated above the recommended range if the permanent pressure drop is acceptable.
- The D.P.'s in the table were calculated using the following formula:

$$D.P. = \left(\frac{GPM \cdot 17.3}{FF} \right)^2$$

Flow factors (FF) for all models are listed below.

Models	FF
200L	86.6
200H	156
250L	139
250H	312
300L	260
300H	537
400L	468
400H	710
500L	693
500H	1730
600L	1210
600H	3465
800L	2080
800H	4765
1000L	3118
1000H	6930
1200L	5200
1200H	8660
1400L	6930

Dimensions not to be used for construction unless prints is certified by factory.

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DIFFERENTIAL PRESSURE: kPa and inches of water

Flow GPM	Models											
	400H	500L	500H	600L	600H	800L	800H	1000L	1000H	1200L	1200H	1400L
400	95	100	16	33								
425	108	113	18	37								
450	121	126	20	41		14						
475	134	141	23	46		16						
500	149	156	25	51		17						
525	164	172	28	56		19						
550	180	189	30	62		21						
575	197	207	33	68		23						
600	214	225	36	74		25						
625	232	244	39	80		27		12				
650	251	263	42	87		29		13				
675	271	285	46	93		32		14				
700	292	306	49	100	12	34		15				
750			56	115	14	39		17				
800			64	131	16	44		20				
850			72	148	18	50		22				
900			81	166	20	56		25				
950			90	185	23	63	12	28				
1000			100	205	25	69	13	31				
1100			121	248	30	84	16	37		13		
1200			144	295	36	100	19	44		16		
1300			169		42	117	22	52		19		
1400			196		49	136	26	60	12	22		
1500			226		56	156	30	69	14	25		14
1600			257		64	178	34	79	16	28		16
1700			290		72	200	38	89	18	32	12	18
1800					81	225	43	100	20	36	13	20
1900					90	250	48	111	23	40	14	23
2000					100	277	53	123	25	44	16	25
2200					121		64	149	30	54	15	30
2400					144		76	178	36	64	23	36
2600					169		89	209	42	75	27	42
2800					196		104	242	49	87	31	49
3000					225		119	278	56	100	36	56
3200					256		135		64	114	41	64
3400					289		153		72	128	46	72
3600							171		81	144	52	81
3800							191		90	160	58	90
4000							211		100	178	64	100
4200							233		110	196	71	110
4400							256		121	215	77	121
4600							280		132	235	85	132
4800									144	256	92	144
5000									156	277	100	156
5500									189		121	189
6000									224		144	224
6500									264		169	264
7000											196	306

Dimensions not to be used for construction unless prints is certified by factory.

Typical Specifications for Manual Venturi Series LAS - LAW - LAG - LAF

Supply and install FLO FAB venturi on all units for ultimate accuracy and lowest possible head loss. Orifices may be used through the permanent head loss with orifices is substantially increased from that of venturi.

On 1/2" through 2" lines, ball valve indicators are furnished as a one-piece valve/orifice with memory lock on the handle.

All flow fittings should be supplied with the unit size, unit location, USGPM and corresponding differential reading in inches of water. Venturi, indicators and ball valve indicators should be supplied with two gauge connections.

Supply a FLO FAB portable meter of the differential diaphragm type model MD60/135. Meter shall be made available to the testing and balancing contractor during the balancing of the systems and shall be handed to the owner at the completion of the project. The meter shall be complete with a master chart for conversion of meter reading to flow and have operating instructions inside the carrying case. The meter shall have two 2" gauges, one with calibration 0" to 135" of water and the other 0' to 60' of water. It shall be equipped with hi-low bleed valves, flexible purge tube, a balancing valve and two hoses all in a ABS resistant carrying cases. Meter can either be rented or furnished as part of the system.

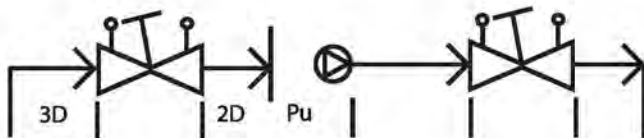
Each venturi and ball valve indicators shall be FLO FAB Series LAS-LAW-LAG-LAF.

RECOMMENDED INSTALLATION

Always install the valve while having the arrow on the body in the flow direction.

In order to avoid turbulence, which will affect the measuring accuracy, it is recommended to have a straight length of pipe up and down stream of the valve as per figure.

10D (instead of 5) is recommended for pumps (D = diameter of pipe). The turbulence, if our recommendations are not adhered



SPECIFICATIONS

FLO FAB Series FM flowmetering element, standard sizes are from 1/2" (15mm) to 2" (50mm) NPT and 6" (150mm) long. Construction shall be standard schedule 40 or 80 to correspond with piping with stainless steel sensing elements. Each measuring station shall be complete with two 1/4" gauge connections and protection caps. Installation shall be in accordance with the manufacturer's instructions.



FEATURES

Sizes: 1/2" (15mm) to 2" (50mm) NPT

Materials: Schedule 40 Steel Pipe
with Stainless Steel sensing elements

Connections: Two 1/4" flare gauges with protection caps

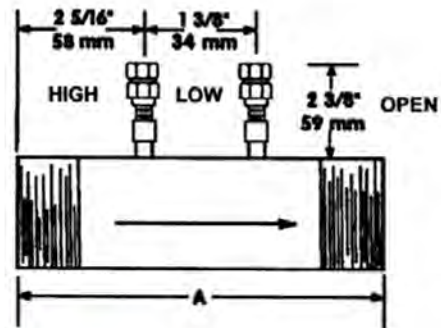
Maximum Working Pressure: 250 PSI (1724 kPa)

Maximum Working Temperature: 250°F (121°C)

OPTIONAL FEATURES

Identification Tags

All Stainless Steel Construction

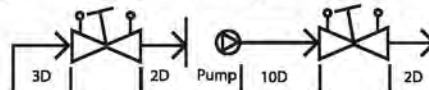


NOMINAL DIMENSIONS

Models	Diameter NPT	A	Weight	Max Meter Range Dia.	15" Diff.	50" Diff.	100" Diff.
FM0050	1/2" 15 mm	6" 152.4 mm	1 lbs 0.45 kg	1/2" 12.7 mm	2" 3.4 USGPM	5" 5.8 USGPM	10" 8 USGPM
FM0075	3/4" 20 mm	6" 152.4 mm	1.5 lbs 0.68 kg	3/4" 19.05 mm	2" 6 USGPM	5" 12 USGPM	10" 10 USGPM
FM0100	1" 25 mm	6" 152.4 mm	1.75 lbs 0.80 kg	1" 25.4 mm	2" 13 USGPM	5" 23 USGPM	10" 35 USGPM
FM0125	1 1/4" 32 mm	6" 152.4 mm	2 lbs 0.90 kg	1 1/4" 31.75 mm	2" 24 USGPM	5" 44 USGPM	9" 65 USGPM
FM0150	1 1/2" 40 mm	6" 152.4 mm	2.75 lbs 1.25 kg	1 1/2" 38.1 mm	2" 33 USGPM	4" 65 USGPM	8" 90 USGPM
FM0200	2" 50 mm	6" 152.4 mm	3 lbs 1.36 kg	2" 50.8 mm	2" 60 USGPM	4" 110 USGPM	7" 150 USGPM

Dimensions are subject to change without notice.

RECOMMENDED INSTALLATION



Always install the valve while having the arrow on the body in the flow direction. In order to avoid turbulence, which will affect the measuring accuracy, it is recommended to have a straight length of pipe up and down stream of the valve see figure. 10D (instead of 5) is recommended for pumps (D = diameter of pipe). The turbulence, if our recommendations are not adhered to, can influence the flow up to 20%.



SPECIFICATIONS

FLO FAB Series FMI flowmetering element, standard sizes are from 2" (50mm) to 24" (600mm) NPT. Construction shall be a 316 stainless steel body and sensing elements. Each sensing element shall be of the bidirectional type having four diametrically apposed sensing ports on both (upstream and downstream) sides, in order to insure averaging velocity and static pressures. Each measuring station shall be complete with two 1/4" gauge connections and protection caps. Installation shall be in accordance with the manufacturer s instructions.

FEATURES

Sizes: 2" (50mm) to 24" (600mm)

Materials: 316 stainless steel body and sensing elements

Connections: Two 1/4" bidirectional sensing elements with protection caps

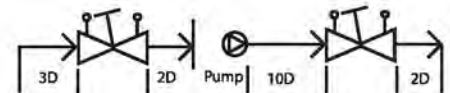
Maximum Working Pressure: 250 PSI (1724 kPa)

Maximum Working Temperature: 250°F (121°C)



RECOMMENDED INSTALLATION

Always install the valve while having the arrow on the body in the flow direction. In order to avoid turbulence, which will affect the measuring accuracy, it is recommended to have a straight length of pipe up and down stream of the valve see figure. 10D (instead of 5) is recommended for pumps (D = diameter of pipe). The turbulence, if our recommendations are not a adhered to, can influence the flow up to 20%.



NOTES

Units from 2" (50mm) to 6" (150mm) shall have single a support and units from 8" (200mm) to 24" (600mm) shall have a double support.

Each station shall be of the same sizes and wall thickness as the pipe diameter in wich it will be installed.

Dimensions not to be used for construction unless prints is certified by factory.

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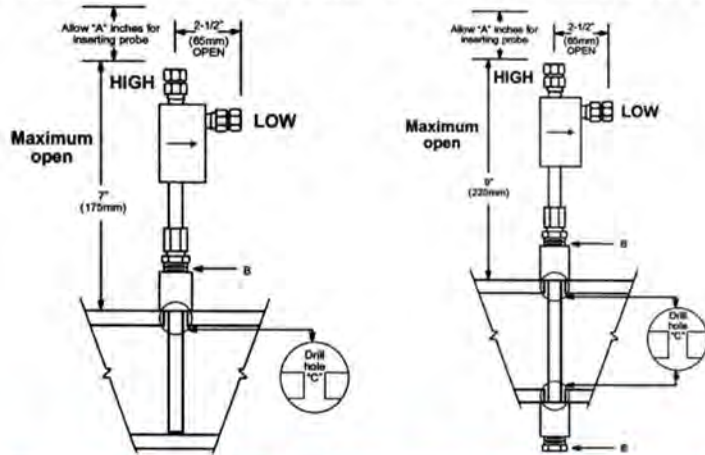
NOTES

Units from 2" (50mm) to 6" (150mm) shall have single a support and units from 8" (200mm) to 24" (600mm) shall have a double support.

Each station shall be of the same sizes and wall thickness as the pipe diameter in wich it will be installed.

* = Pressure Drop is less than 1" of water

SINGLE SUPPORT FMI DOUBLE SUPPORT FMI



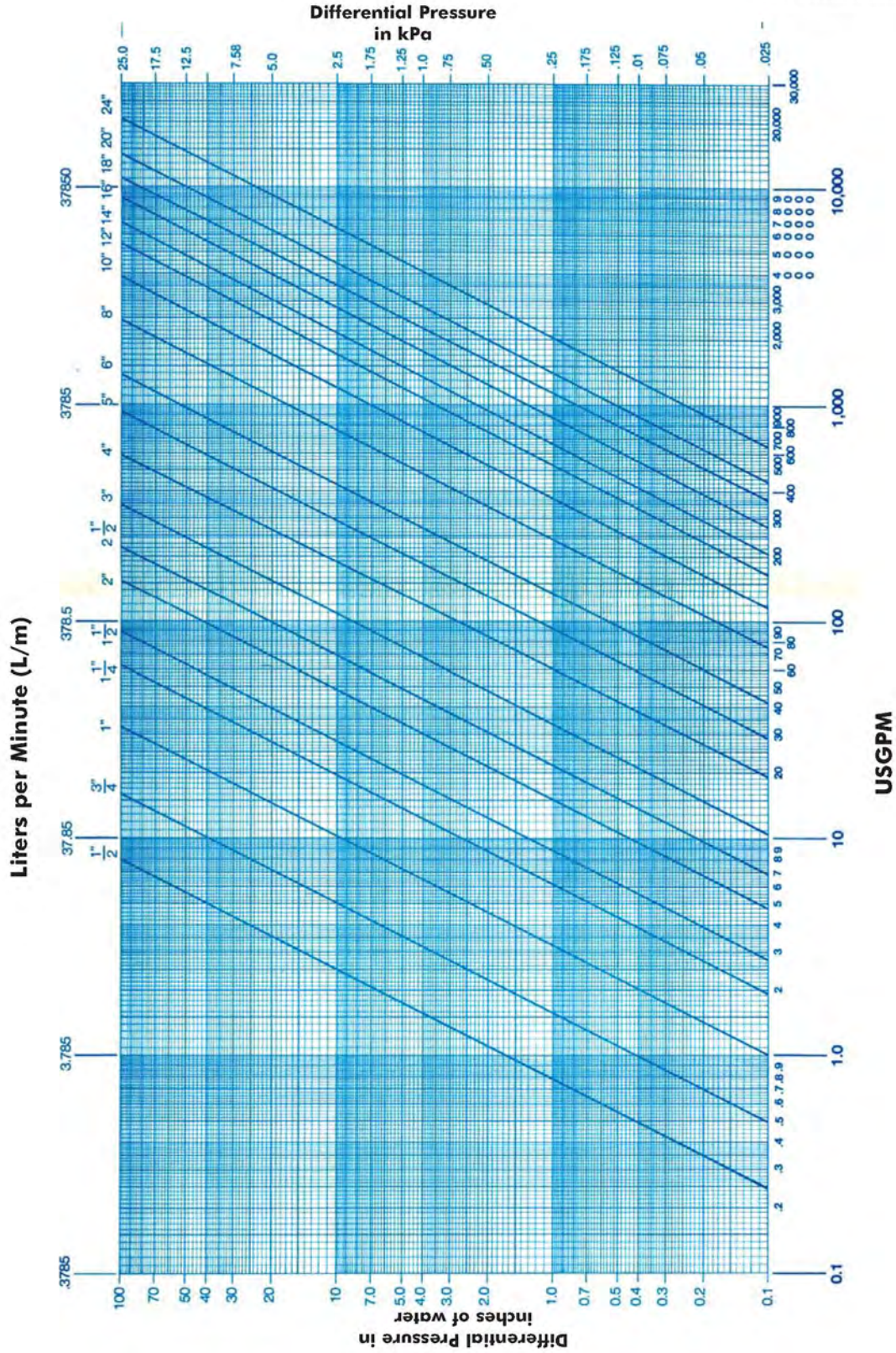
NOMINAL DIMENSIONS

Models	Diameter	A	B	C	Weight	Max Meter Range Dia.	15" Diff.	50" Diff.	100" Diff.
FMI0200	2" 50 mm	4" 101.16 mm	3/8" 10.16 mm	3/8" 10.16 mm	2 lbs 0.91 kg	2" 50.8 mm	2"	4"	7"
FMI0200	2 1/2" 62.5 mm	5" 127 mm	3/8" 10.16 mm	3/8" 10.16 mm	2 lbs 0.91 kg	2 1/2" 63.5 mm	1"	4"	7"
FMI0300	3" 75 mm	5" 127 mm	3/8" 10.16 mm	3/8" 10.16 mm	2 lbs 0.91 kg	3" 76.2 mm	1"	3"	6"
FMI0400	4" 100 mm	6" 152.4 mm	3/8" 10.16 mm	3/8" 10.16 mm	2.5 lbs 1.14 kg	4" 101.16 mm	1"	3"	6"
FMI0500	5" 125 mm	7" 177.8 mm	1/2" 12.7 mm	7/16" 11.43 mm	2.5 lbs 1.14 kg	5" 127 mm	*	2"	3"
FMI0600	6" 150 mm	8" 203.2 mm	1/2" 12.7 mm	7/16" 11.43 mm	3 lbs 1.36 kg	6" 152.4 mm	*	2"	3"
FMI0800	8" 200 mm	28" 711.2 mm	1/2" 12.7 mm	1/2" 12.7 mm	3 lbs 1.36 kg	8" 203.2 mm	*	1"	2"
FMI1000	10" 250 mm	28" 711.2 mm	1/2" 12.7 mm	1/2" 12.7 mm	3 lbs 1.36 kg	10" 254 mm	*	1"	2"
FMI1200	12" 300 mm	28" 711.2 mm	1/2" 12.7 mm	5/8" 13.97 mm	3 lbs 1.36 kg	12" 304.8 mm	*	*	1"
FMI1400	14" 350 mm	34" 863.6 mm	3/4" 19.05 mm	7/8" 20.32 mm	4 lbs 1.81 kg	14" 355.6 mm	*	*	1"
FMI1600	16" 400 mm	34" 863.6 mm	3/4" 19.05 mm	7/8" 20.32 mm	5 lbs 2.27 kg	16" 406.4 mm	*	*	*
FMI1800	18" 450 mm	34" 863.6 mm	1" 25.4 mm	1 1/8" 27.94 mm	8 lbs 3.64 kg	18" 457.2 mm	*	*	*
FMI2000	20" 500 mm	34" 863.6 mm	1" 25.4 mm	1 1/8" 27.94 mm	10 lbs 4.55 kg	20" 508 mm	*	*	*
FMI2400	24" 600 mm	34" 863.6 mm	1" 25.4 mm	1 1/8" 27.94 mm	12 lbs 5.45 kg	24" 609.6 mm	*	*	*

Dimensions are subject to change without notice.



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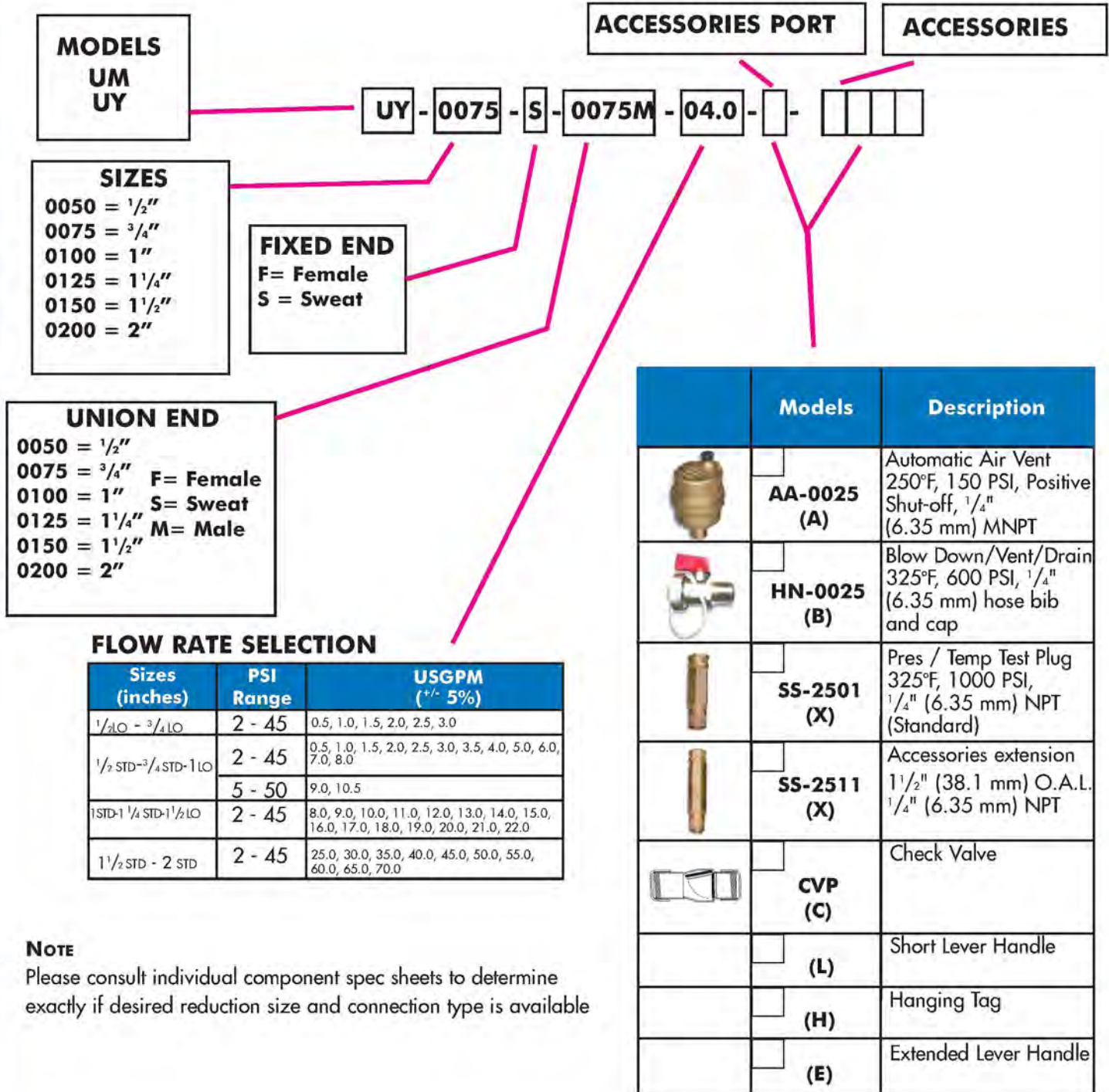
Nominal pipe size
 Schedule 40
 Specific Gravity: 1.0
 Water Temperature: 70°F

Effective: 07-85
 Supersedes: 02-83

L/m = USGPM x 0.2642
 kPa = in of water x 0.25

Model Selection Explanation Series UY - UM

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NOTE

Please consult individual component spec sheets to determine exactly if desired reduction size and connection type is available

Dimensions not to be used for construction unless prints is certified by factory.

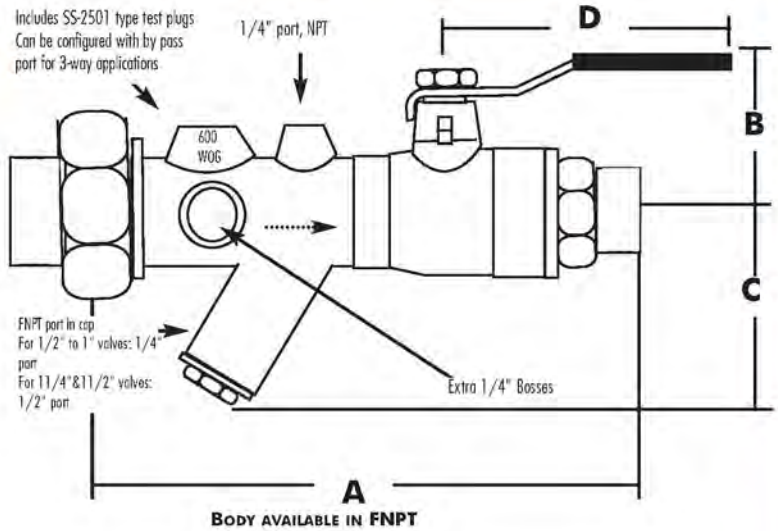


Full Port Ball Valve & Strainer Series UY

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FLOW RATE SELECTION

Sizes (inches)	PSI Range	USGPM (+/- 5%)
3/4" LO	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0
1/2" STD - 3/4" STD	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0
	5 - 50	9.0, 10.5
1" STD - 1 1/4" STD	2 - 45	8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0
1 1/2" STD - 2" STD	2 - 45	25.0, 30.0, 35.0, 40.0, 45.0, 50.0, 55.0, 60.0, 65.0, 70.0



FEATURES

Body Material: Forged Brass (Cast Bronze for 2" model only)
 with 600 WOG EPDM O' rings

Interchangeable Union Ends

Blow out Proof Shaft

Double Shaft Seals

Removable Filter Screen

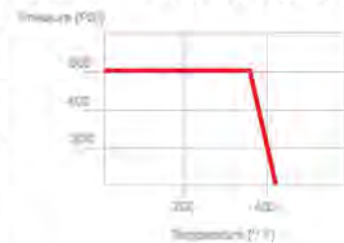
1/4" (7 mm) FNPT Option Port

NOMINAL DIMENSIONS

Models	A (NPT)	B	C	D	Cv	Filter Area	Weight
UY0050 (1/2")	6" / 150 mm	1 1/16" / 43.18 mm	1 9/16" / 40.64 mm	1 5/16" / 48.26 mm	1.1	2 11/16" / 68.58 mm	5.5 lbs / 2.5 kg
UY0075L (3/4")	6" / 150 mm	1 11/16" / 43.18 mm	1 9/16" / 40.64 mm	1 5/16" / 48.26 mm	1.1	2 11/16" / 68.58 mm	5.5 lbs / 2.5 kg
UY0075 (3/4")	6" / 150 mm	1 7/8" / 45.72 mm	2 3/8" / 60.96 mm	3 3/8" / 86.36 mm	2.1	7 3/8" / 187.96 mm	9 lbs / 4.09 kg
UY0100 (1")	8" / 200 mm	1 7/8" / 45.72 mm	2 3/8" / 60.96 mm	3 3/8" / 86.36 mm	2.1	7 3/8" / 187.96 mm	9 lbs / 4.09 kg
UY0125 (1 1/4")	8" / 200 mm	2 1/2" / 63.5 mm	3 1/2" / 88.9 mm	4 3/8" / 111.76 mm	4.1	16 11/16" / 424.18 mm	28 lbs / 12.73 kg
UY0150 (1 1/2")	8" / 200 mm	2 1/2" / 63.5 mm	3 1/2" / 88.9 mm	4 3/8" / 111.76 mm	4.2	16 11/16" / 424.18 mm	28 lbs / 12.73 kg
UY0200 (2")	10" / 250 mm	3 3/8" / 86.36 mm	5 1/8" / 129.54 mm	4 3/8" / 111.76 mm	8	20 9/16" / 523.24 mm	N/D



VALVE SEAT RATING



Dimensions not to be used for construction unless prints is certified by factory.

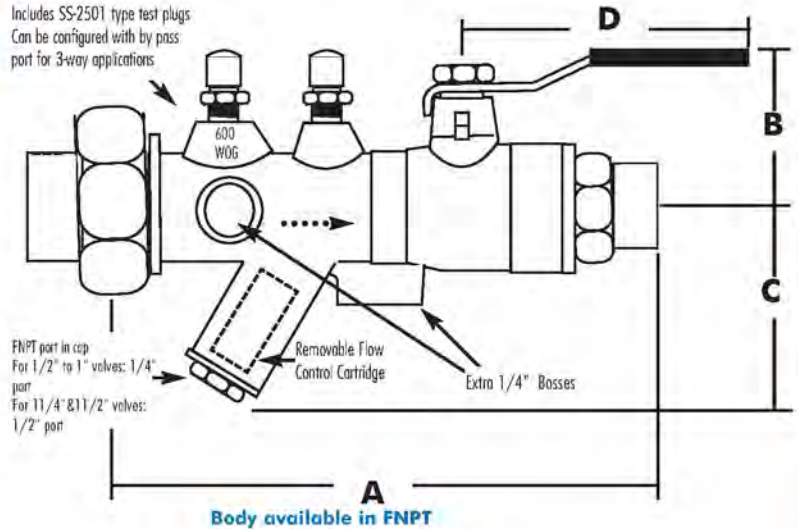
Flow Control & Combination Ball Valve Series UM

SUBMITTAL DATA SHEET
ISSUE DATE: MAY 2008
REVISION DATE: MAY 2008

FLOW RATE SELECTION

Sizes (inches)	PSI Range	USGPM (+/- 5%)
1/2 LO - 3/4 LO	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0
1/2 STD-3/4 STD-1 LO	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0, 8.0
	5 - 50	9.0, 10.5
1 STD-1 1/4 STD-1 1/2 LO	2 - 45	8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0
1 1/2 STD - 2 STD	2 - 45	25.0, 30.0, 35.0, 40.0, 45.0, 50.0, 55.0, 60.0, 65.0, 70.0

Includes SS-2501 type test plugs
Can be configured with by pass port for 3-way applications



FEATURES

Body Material: Forged Brass
(Cast Bronze for 2" model only)
with 600 WOG EPDM O'rings

Interchangeable Union Ends

Blow out Proof Shaft

Double Shaft Seals

Removable Flow Cartridge

NOMINAL DIMENSIONS

Models	A (NPT)	B	C	D	Cv ⁽²⁾	Ball ID	Weight
UM0050L (1/2")	3/8" 95 mm	1 1/16" 43.18 mm	1 9/16" 40.64 mm	1 15/16" 48.26 mm	9	7/8" 20.32 mm	1.2 lbs 0.55 kg
UM0050 (1/2")	5/16" 130 mm	1 7/8" 45.72 mm	2 7/16" 62.23 mm	3 7/16" 87.63 mm	14	7/8" 20.32 mm	2.3 lbs 1.05 kg
UM0075L (3/4")	3/8" 95 mm	1 1/16" 43.18 mm	1 9/16" 40.64 mm	1 15/16" 48.26 mm	14	7/8" 20.32 mm	1.3 lbs 0.59 kg
UM0075 (3/4")	5/16" 130 mm	1 7/8" 45.72 mm	2 7/16" 62.23 mm	3 7/16" 87.63 mm	9	7/8" 20.32 mm	2.2 lbs 1 kg
UM0100L(1) (1")	5/16" 132.5 mm	1 7/8" 45.72 mm	2 7/16" 62.23 mm	3 7/16" 87.63 mm	14	7/8" 20.32 mm	2.3 lbs 1.05 kg
UM0100 (1")	6 1/2" 162.5 mm	2 5/8" 64.77 mm	3 1/2" 88.9 mm	4 3/8" 111.76 mm	32	1 1/16" 43.18 mm	4.4 lbs 2 kg
UM0125 (1 1/4")	6 9/16" 165 mm	2 5/8" 64.77 mm	3 1/2" 88.9 mm	4 3/8" 111.76 mm	32	1 1/4" 31.75 mm	4.4 lbs 2 kg
UM0150L (1 1/2")	6 9/16" 165 mm	2 5/8" 64.77 mm	3 1/2" 88.9 mm	4 3/8" 111.76 mm	32	1 1/4" 31.75 mm	4.5 lbs 2.05 kg
UM0150 (1 1/2")	9" 225 mm	3 3/8" 86.36 mm	5 1/8" 129.54 mm	4 3/8" 111.76 mm	N/D	1 1/4" 31.75 mm	7.8 lbs 3.55 kg
UM0200 (2")	9" 225 mm	3 3/8" 86.36 mm	5 1/8" 129.54 mm	4 3/8" 111.76 mm	N/D	1 1/4" 31.75 mm	7.8 lbs 3.55 kg



VALVE SEAT RATING



NOTES

- (1) For 1" flow rates > 8 USGPM Use larger body
- (2) Cv based on valve body only

Dimensions not to be used for construction unless prints is certified by factory.



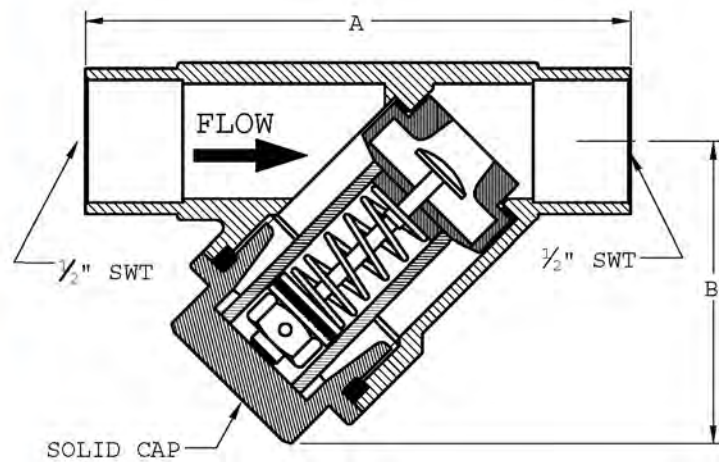
Automatic Flow Control Series UMS

SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008

FEATURES

Body Material: Forged Brass ASTM B283
 with 600 WOG Viton/EPDM O-rings and
 Stainless Steel/Brass flow cartridge

Hot Forged Brass Body
 Removable Flow Cartridge



NOMINAL DIMENSIONS

Models	A	B	Cv*	Weight
UMS0050 1/2"	2 1/4" 57.15 mm	2 3/16" 55.88 mm	9	0.43 lbs 0.20 kg

* Cv based on valve body only

MODEL UMS - 0050S - 0.5

SIZES
0050S = 1/2"

FLOW RATE SELECTION

Sizes (inches)	PSI Range	USGPM (+/- 5%)
1/2	2 - 45	0.5, 1.0, 1.5, 2.0, 2.5, 3.0

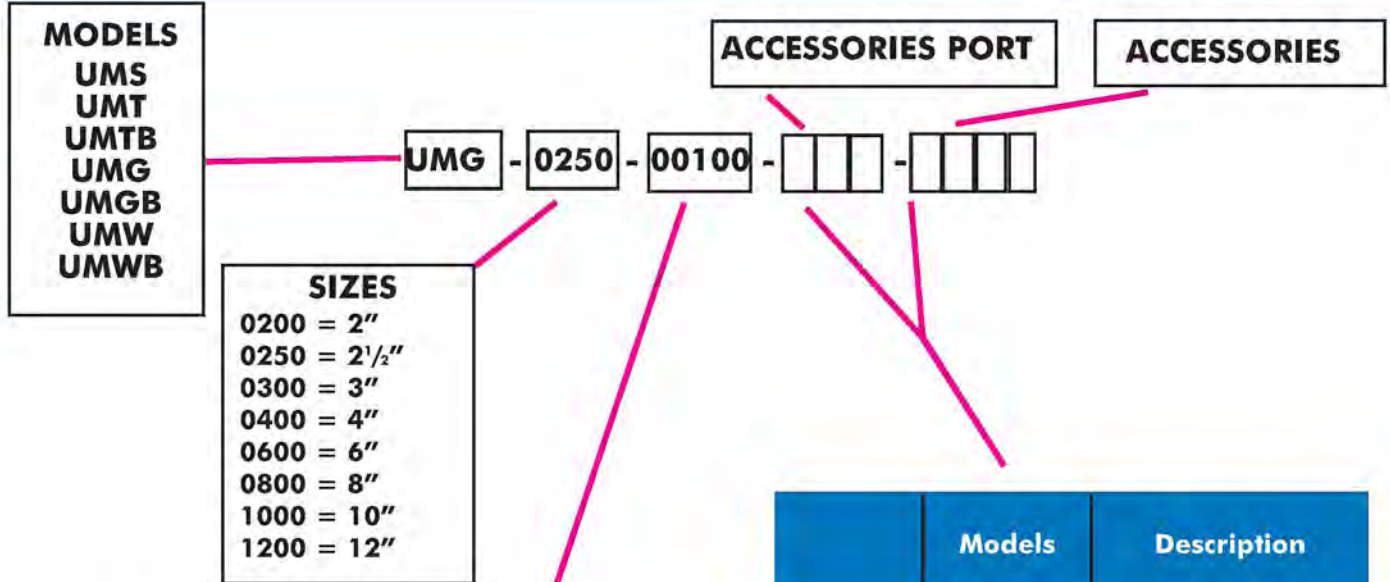
NOTE

No Accessories Available

Dimensions not to be used for construction unless prints is certified by factory.






Model Selection Explanation Series UMT to UMWB

SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008



FLOW SELECTION

Sizes (inches)	USGPM (+/-5%)
2 LO	25 - 70
2 STD	75 - 100
2 1/2 LO	25 - 70
2 1/2 STD	75 - 100
3 LO	25 - 70
3 STD	75 - 120
4 LO	75 - 120
4 STD	125 - 240
6 LO	75 - 240
6 STD	245 - 480
8 LO	125 - 480
8 STD	485 - 840
10 LO	480 - 720
10 STD	725 - 1320
12 LO	725 - 1320
12 STD	1325 - 2280

	Models	Description
	<input type="checkbox"/> AA-0025 (A)	Automatic Air Vent 250°F, 150 PSI, Positive Shut-off, 1/4" (6.35 mm) MNPT
	<input type="checkbox"/> HN-0025 (B)	Blow Down/Vent/Drain 325°F, 600 PSI, 1/4" (6.35 mm) hose bib and cap
	<input type="checkbox"/> SS-2501 (X)	Pres / Temp Test Plug 325°F, 1000 PSI, 1/4" (6.35 mm) NPT (Standard)
	<input type="checkbox"/> SS-2511 (X)	Accessories extension 1 1/2" (38.1 mm) O.A.L. 1/4" (6.35 mm) NPT
	<input type="checkbox"/> CVP (C)	Check Valve
	<input type="checkbox"/> (L)	Short Lever Handle
	<input type="checkbox"/> (H)	Hanging Tag
	<input type="checkbox"/> (E)	Extended Lever Handle

NOTE
 Please consult individual component spec sheets to determine exactly if desired reduction size and connection type is available

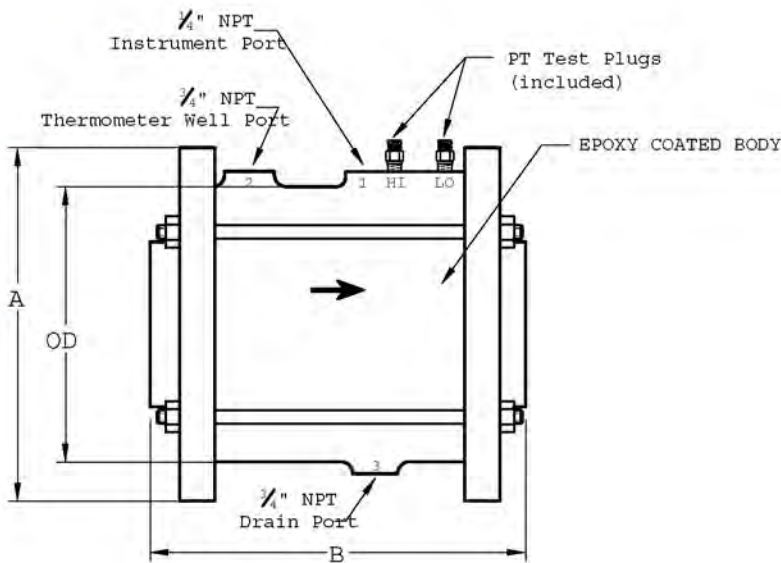


Threaded End Flow Control Valve Series UMT

SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008

FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge



NOMINAL DIMENSIONS

Models	A	B	OD	Weight
UMT0200LO 2"	7" 177.8 mm	10 ³ / ₈ " 264.16 mm	4 ¹¹ / ₁₆ " 119.38 mm	34.7 lbs 15.74 kg
UMT0200STD 2"	7 ¹ / ₂ " 190.5 mm	12 ¹ / ₂ " 317.5 mm	5" 127 mm	45.1 lbs 20.46 kg
UMT0250LO 2 ¹ / ₂ "	7" 177.8 mm	10 ¹¹ / ₁₆ " 271.78 mm	4 ¹¹ / ₁₆ " 119.38 mm	33.7 lbs 15.29 kg
UMT0250STD 2 ¹ / ₂ "	7 ¹ / ₂ " 190.5 mm	12 ⁷ / ₈ " 325.12 mm	5" 127 mm	44.1 lbs 20 kg

FLOW RATE SELECTION

Sizes (inches)	USGPM (^{+/-} 5% - 5 USGPM Increments)
2 LO	25 - 70
2 1/2 LO	25 - 70
2 STD	75 - 100
2 1/2 STD	75 - 100

Dimensions not to be used for construction unless prints is certified by factory.

Threaded End Flow Control Valve w/Shutoff Valve Series UMTB

SUBMITTAL DATA SHEET
ISSUE DATE: MAY 2008
REVISION DATE: MAY 2008



FLOW RATE SELECTION

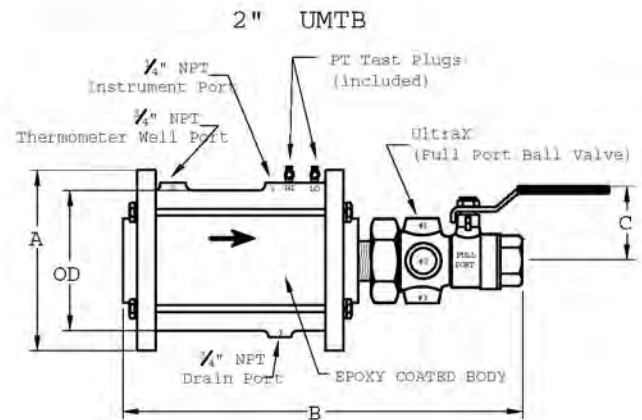
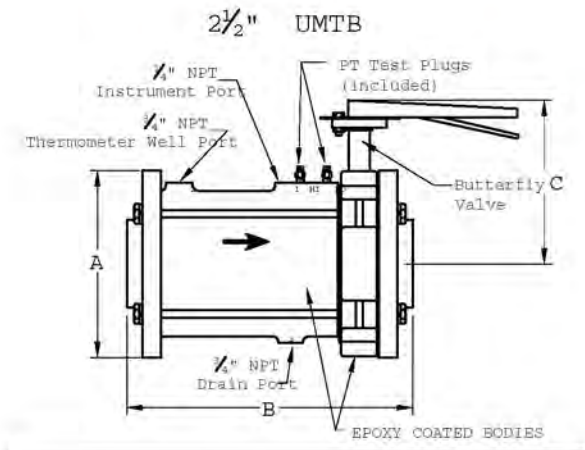
Sizes (inches)	USGPM (* +/- 5% - 5 USGPM Increments)
2 LO	25 - 70
2 1/2 LO	25 - 70
2 STD	75 - 100
2 1/2 STD	75 - 100

FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge

Shutoff Valve (2"): Full port, 600 WOG, NPT Ball Valve, Hot forged brass, 400 PSI (2757.9 kPa), 300°F (148.89°C), Dual stem Seals

Shutoff Valve (2 1/2"): Epoxy coated cast iron ASTM A126, Lug Type Butterfly Valve, 225 PSI (1551.32 kPa), 250°F (121.1°C), Aluminium/Bronze disc, Stainless Steel Shaft



NOMINAL DIMENSIONS

Models	A	B		A	OD	Weight
		BV	Ball			
UMTB0200LO 2"	7" 177.8 mm	N/A	18" 457.2 mm	7" 177.8 mm	4 1/16" 119.38 mm	34.7 lbs 15.74 kg
UMTB0200STD 2"	7 1/2" 190.5 mm	N/A	20" 508 mm	7 1/2" 190.5 mm	5" 127 mm	45.1 lbs 20.46 kg
UMTB0250LO 2 1/2"	7" 177.8 mm	11 1/16" 294.64 mm	N/A	7" 177.8 mm	4 1/16" 119.38 mm	33.7 lbs 15.29 kg
UMTB0250STD 2 1/2"	7 1/2" 190.5 mm	13 7/8" 350.52 mm	N/A	7 1/2" 190.5 mm	5" 127 mm	44.1 lbs 20 kg

Dimensions not to be used for construction unless prints is certified by factory.



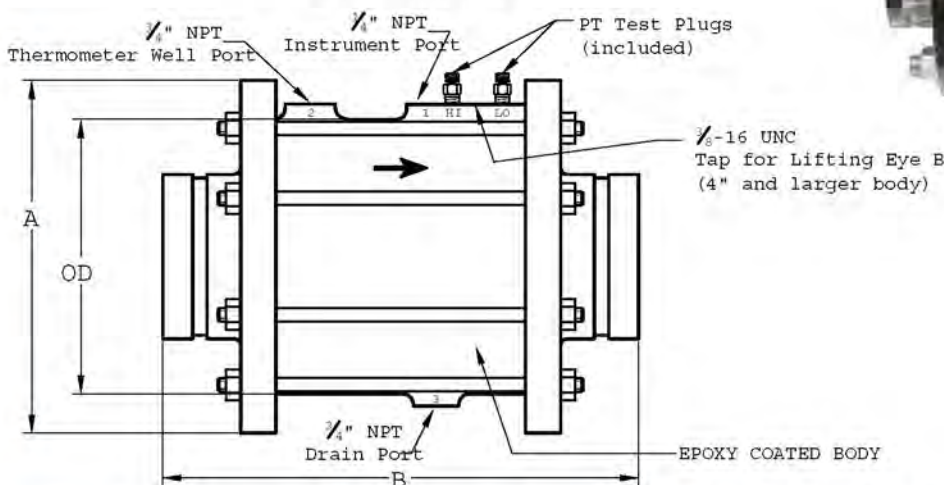
Grooved End Flow Control Valve Series UMG

SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008

FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge

2 1/2" thru 12"



NOMINAL DIMENSIONS

Models	A	B	OD	Weight
UMG0250LO 2 1/2"	7" 177.8 mm	13 3/8" 332.74 mm	4 11/16" 119.38 mm	35.8 lbs 16.24 kg
UMG0250STD 2 1/2"	7 1/2" 190.5 mm	15 5/16" 386.08 mm	5" 127 mm	43.6 lbs 19.78 kg
UMG0300LO UMG0300STD 3"	7 1/2" 190.5 mm	15 5/16" 388.62 mm	5" 127 mm	44.6 lbs 20.23 kg
UMG0400LO UMG0400STD 4"	9" 228.6 mm	15 5/16" 388.62 mm	6 7/8" 172.72 mm	70.8 lbs 32.11 kg
UMG0600LO UMG0600STD 6"	11" 279.4 mm	15 5/16" 396.24 mm	8 9/16" 218.44 mm	107 lbs 48.53 kg
UMG0800LO UMG0800STD 8"	13 1/2" 342.9 mm	16 3/16" 411.48 mm	11" 279.4 mm	148.5 lbs 67.36 kg
UMG1000LO UMG1000STD 10"	16" 406.4 mm	16 11/16" 424.18 mm	13 3/8" 340.36 mm	221.1 lbs 100.29 kg
UMG1200LO UMG1200STD 12"	19" 482.6 mm	16 7/8" 426.72 mm	16 1/8" 408.94 mm	303.4 lbs 137.62 kg

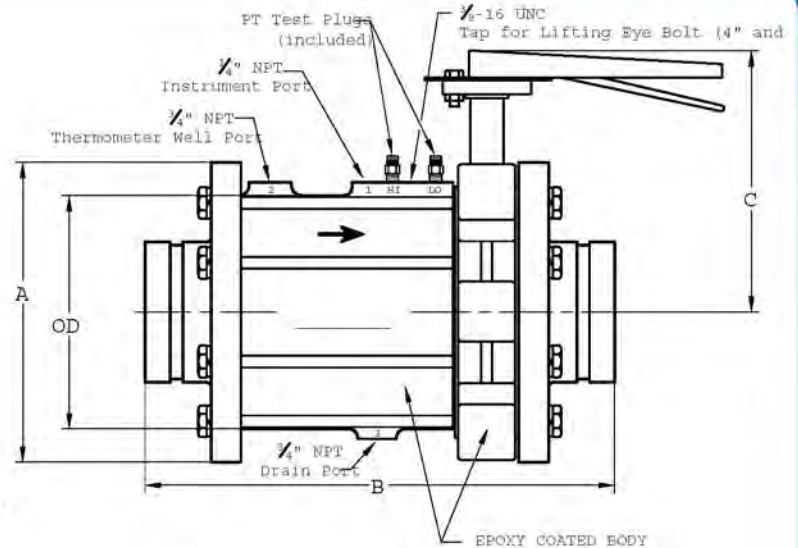
FLOW RATE SELECTION

Sizes (inches)	USGPM (+/-5% - 5 USGPM Increments)
2 1/2 LO	25 - 70
2 1/2 STD	75 - 120
3 LO	25 - 70
3 STD	75 - 120
4 LO	75 - 120
4 STD	125 - 240
6 LO	75 - 240
6 STD	245 - 480
8 LO	125 - 480
8 STD	485 - 840
10 LO	480 - 720
10 STD	725 - 1320
12 LO	725 - 1320
12 STD	1325 - 2280

Dimensions not to be used for construction unless prints is certified by factory.

Grooved End Flow Control Valve w/Butterfly Valve Series UMGB

SUBMITTAL DATA SHEET
ISSUE DATE: MAY 2008
REVISION DATE: MAY 2008



FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge

Butterfly Valve: Epoxy coated cast iron ASTM A126, Lug Type Butterfly Valve, 225 PSI (1551.32 kPa), 250°F (121.1°C), Aluminium/Bronze disc, Stainless Steel Shaft

NOMINAL DIMENSIONS

Models	A	B	C	OD	Weight
UMGB0250LO 2 1/2"	7" 177.8 mm	14 7/8" 375.92 mm	8 3/16" 208.28 mm	4 1/16" 119.38 mm	48.2 lbs 21.86 kg
UMGB0250STD 2 1/2"	7 1/2" 190.5 mm	16 13/16" 429.26 mm	8 3/16" 208.28 mm	5" 127 mm	56.1 lbs 25.45 kg
UMGB0300LO UMGB0300STD 3"	7 1/2" 190.5 mm	17 1/8" 434.34 mm	8 3/8" 213.36 mm	5" 127 mm	57.1 lbs 25.9 kg
UMGB0400LO UMGB0400STD 4"	9" 228.6 mm	17 3/16" 439.42 mm	9 1/8" 231.14 mm	6 7/8" 172.72 mm	89 lbs 40.37 kg
UMGB0600LO UMGB0600STD 6"	11" 279.4 mm	17 7/8" 452.12 mm	10 3/16" 259.08 mm	8 7/16" 218.44 mm	136.8 lbs 62.05 kg

FLOW RATE SELECTION

Sizes (inches)	USGPM ($\pm 5\%$ - 5 USGPM Increments)
2 1/2 LO	25 - 70
2 1/2 STD	75 - 120
3 LO	25 - 70
3 STD	75 - 120
4 LO	75 - 120
4 STD	125 - 240
6 LO	75 - 240
6 STD	245 - 480

Dimensions not to be used for construction unless prints is certified by factory.



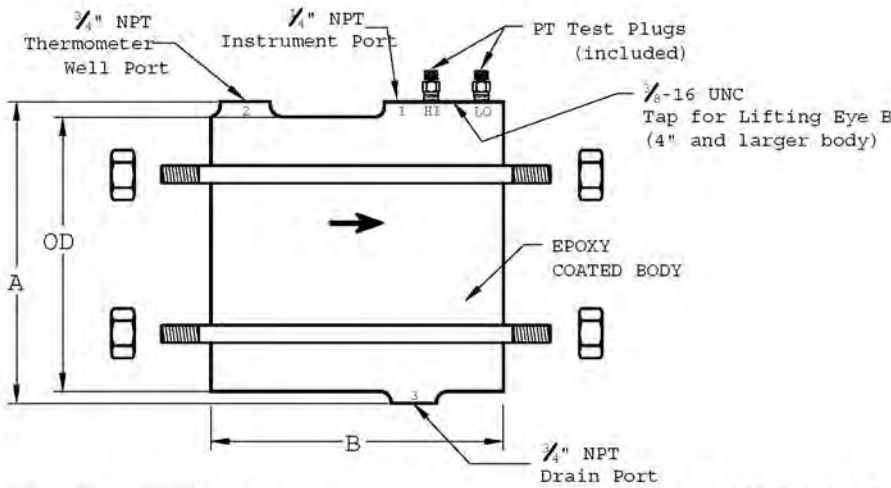
Wafer Style Flow Control Valve Series UMW

SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008

FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge

2 1/2" thru 12"



NOMINAL DIMENSIONS

Models	A	B	OD	Weight
UMW0250LO 2 1/2"	5 7/8" 129.54 mm	8 3/8" 213.36 mm	4 1/16" 119.38 mm	22.3 lbs 10.12 kg
UMW0300LO UMW0300STD 3"	5 7/16" 142.24 mm	10 1/2" 266.7 mm	5" 127 mm	28.1 lbs 12.75 kg
UMW0400LO UMW0400STD 4"	7 3/8" 187.96 mm	10" 254 mm	6 7/8" 172.72 mm	45.8 lbs 20.77 kg
UMW0600LO UMW0600STD 6"	9 3/16" 233.68 mm	10" 254 mm	8 7/16" 218.44 mm	63 lbs 28.58 kg
UMW0800LO UMW0800STD 8"	11 7/16" 294.64 mm	10" 254 mm	11" 279.4 mm	87.3 lbs 39.59 kg
UMW1000LO UMW1000STD 10"	13 15/16" 353.06 mm	10" 254 mm	13 3/8" 340.36 mm	131.1 lbs 59.47 kg
UMW1200LO UMW1200STD 12"	16 11/16" 424.18 mm	10" 254 mm	16 1/8" 408.94 mm	176.2 lbs 79.92 kg

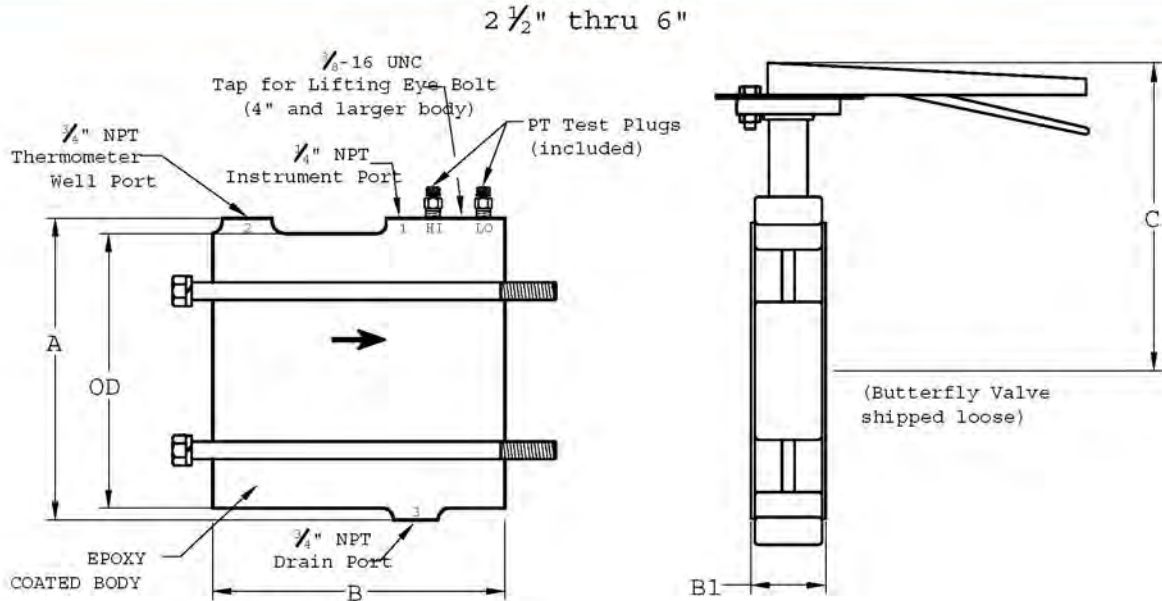
FLOW RATE SELECTION

Sizes (inches)	USGPM ($\pm 5\%$ - 5 USGPM Increments)
2 1/2 LO	25 - 70
3 LO	25 - 70
3 STD	75 - 120
4 LO	75 - 120
4 STD	125 - 240
6 LO	75 - 240
6 STD	245 - 480
8 LO	125 - 480
8 STD	485 - 840
10 LO	480 - 720
10 STD	725 - 1320
12 LO	725 - 1320
12 STD	1325 - 2280

Dimensions not to be used for construction unless prints is certified by factory.

Wafer Style Flow Control Valve w/Butterfly Valve Series UMWB

SUBMITTAL DATA SHEET
ISSUE DATE: MAY 2008
REVISION DATE: MAY 2008



FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge

Buterfly Valve: Epoxy coated cast iron ASTM A126, Lug Type Butterfly Valve, 225 PSI (1551.32 kPa), 250°F (121.1°C), Aluminium/Bronze disc, Stainless Steel Shaft



NOMINAL DIMENSIONS

Models	A	B	B1	OD	Weight
UMWB0250 2 1/2"	5 1/8" 129.54 mm	8 3/8" 213.36 mm	1 7/8" 45.72 mm	4 1/16" 119.38 mm	34.4 lbs 15.60 kg
UMWB0300LO UMWB0300STD 3"	5 9/16" 142.24 mm	10 1/2" 266.7 mm	1 7/8" 45.72 mm	5" 127 mm	39.7 lbs 18.01 kg
UMWB0400LO UMWB0400STD 4"	7 3/8" 187.96 mm	10" 254 mm	2" 50.8 mm	6 7/8" 172.72 mm	61.8 lbs 28.03 kg
UMWB0600LO UMWB0600STD 6"	9 3/16" 233.68 mm	10" 254 mm	2 3/16" 55.88 mm	8 9/16" 218.44 mm	90.2 lbs 40.91 kg

FLOW RATE SELECTION

Sizes (inches)	USGPM (^{+/-} 5% - 5 USGPM Increments)
2 1/2 LO	25 - 70
3 LO	25 - 70
3 STD	75 - 120
4 LO	75 - 120
4 STD	125 - 240
6 LO	75 - 240
6 STD	245 - 480

Dimensions not to be used for construction unless prints is certified by factory.

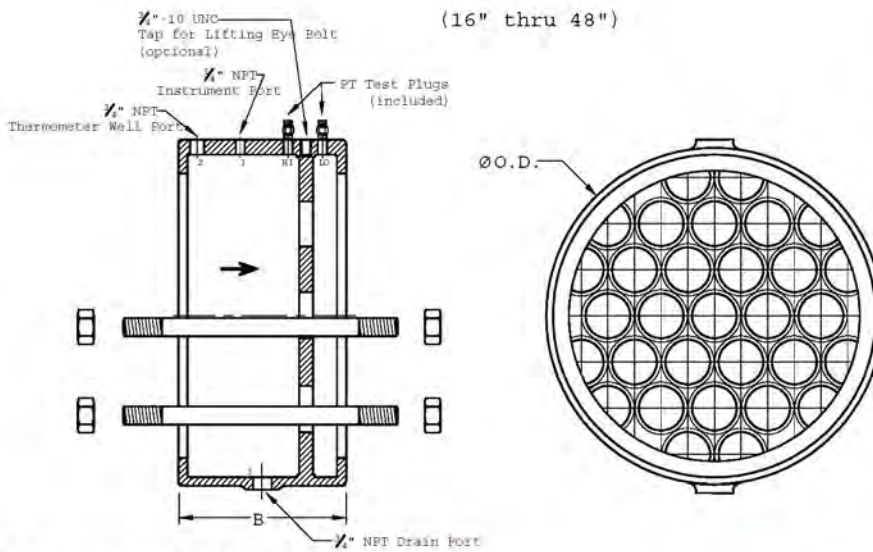


Large Wafer Style Flow Control Valve Series UMW

SUBMITTAL DATA SHEET
 ISSUE DATE: MAY 2008
 REVISION DATE: MAY 2008

FEATURES

Body Material: Epoxy coated ductil iron ASTM A536 body with EPDM cartridge seals, zinc plated studs and nuts and a stainless steel/brass flow cartridge



NOMINAL DIMENSIONS

Models	B	OD	Max STD USGPM Range (±. 5% - 5 USGPM Increments)
UMW1600 16"	10" 254 mm	20" 508 mm	3 240
UMW1800 18"	10" 254 mm	21 ³ / ₈ " 543.56 mm	3 720
UMW2000 20"	10" 254 mm	23 ¹ / ₁₆ " 599.44 mm	4 440
UMW2400 24"	10" 254 mm	28" 711.2 mm	6 600
UMW3000 30"	12" 304.8 mm	34 ¹ / ₂ " 876.3 mm	10 200
UMW3600 36"	12" 304.8 mm	41" 1041.4 mm	14 520
UMW4200 42"	12" 304.8 mm	47 ¹ / ₈ " 1214.12 mm	19 920
UMW4800 48"	12" 304.8 mm	54 ³ / ₁₆ " 1379.22 mm	25 920

Dimensions not to be used for construction unless prints is certified by factory.

Portable Meter Series MD

SPECIFICATIONS

FLO FAB Series MD portable meter shall be made available to the testing and balancing contractor during the balancing of the systems and shall be handed to the owner at the completion of the project. The meter shall be complete with a master chart of conversion of meter reading to flow and have operating instructions inside the carrying case. The meter shall be equipped with two gauges, hi-low bleed valves, flexible purge tube, a balancing valve and two hoses all in a ABS resistant carrying case.

FEATURES

- Gauges:** Two 2 1/2" gauges,
The first calibrated from 0" to 135" of water,
The second calibrated from 0' to 60' of water.
- Maximum Working Pressure:** 250 PSI (1724 kPa)
- Maximum Working Temperature:** 250°F (121°C)





FF

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**Manufacturer of Pumps, Tanks, Heat Exchangers & Accessories
for HVAC Market After-Sales Parts and Services**

FLO-FAB INC
LAKE WORTH,
FLORIDA, USA

SEPTEMBER 2009