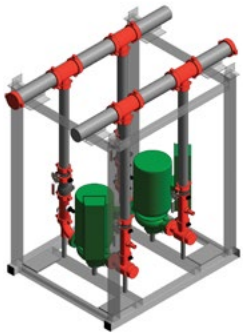
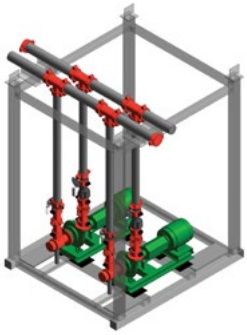
Victaulic Modular Dual Pump Skids
Series 387 Inline
Series 388 End Suction

102.87



Series 387 Inline
Modular Dual Pump Skid



Series 388 End Suction
Modular Dual Pump Skid

1.0 PRODUCT DESCRIPTION

Available Sizes

- Series 387A: For inline pump connection size 3"
- Series 387B: For inline pump connection sizes 4 – 10"
- Series 388A: For end suction pump connection sizes 2½ – 3½"
- Series 388B: For end suction pump connection sizes 4 – 10"

NOTE

- Customer will free issue the pumps to Victaulic to be included in the Series 387/388 Modular Dual Pump Skid.

Maximum Working Pressure

- Rated to the working pressure of the flange connection up to a maximum of 300 psi/2068 kPa/21 bar

Temperature Range

- –30°F to +230°F/–34°C to +110°C

Application

- The Series 387/388 Modular Dual Pump Skids will be configured with Victaulic Series 380/381/382/383 Vibration Isolation Pump Drops

NOTE

- The information listed in this publication is a typical representation of a Series 387/388 Modular Dual Pump Skid. Please contact a Victaulic sales representative to determine the best configuration for each project.

2.0 CERTIFICATION/LISTINGS

Product designed and manufactured under the Victaulic Quality Management System, as certified by LPCB in accordance with ISO-9001.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

3.0 SPECIFICATIONS – MATERIAL

Structurally engineered steelwork frame conforming to ASTM A500 Grade C, welded to AWS D1.1, painted black.

Standard weight carbon steel conforming to ASTM A53, Type E, Grade B.

Victaulic Original Groove System (OGS).

Standard Coating: Orange enamel.

Gaskets: EPDM.

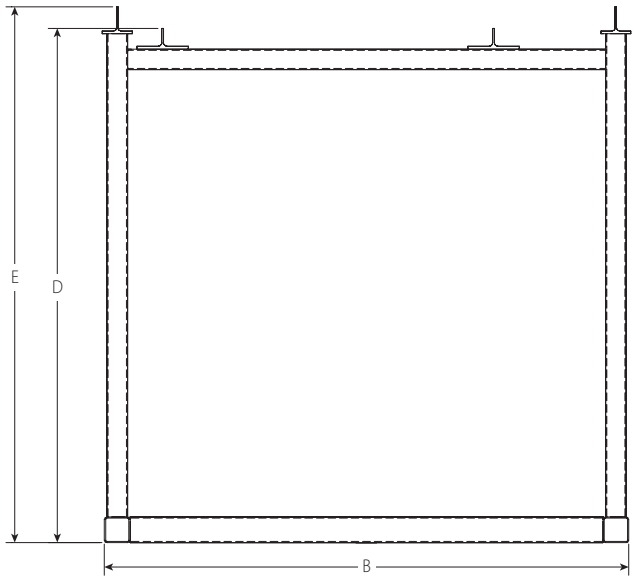
Bolts/Nuts: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449. Carbon steel heavy hex nuts meeting the mechanical property requirements of ASTM A563 Grade B. Track bolts and heavy hex nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

NOTE

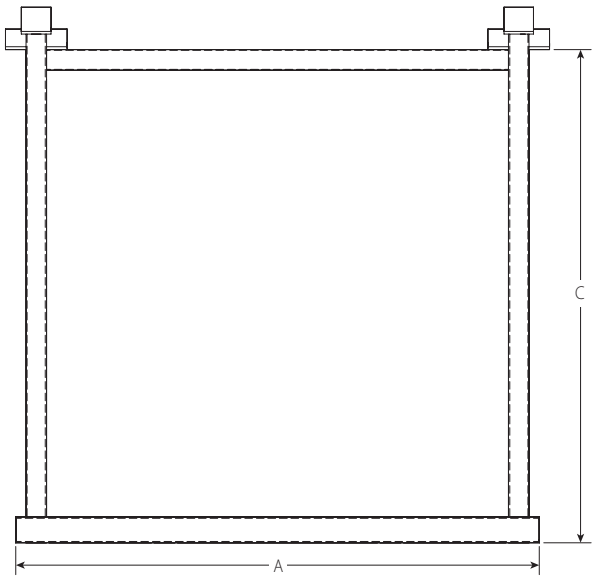
- Material specifications for the components included in the Series 387/388 Modular Dual Pump Skids are listed in their respective submittals. Please see section 7.0 Reference Materials for more information.

4.0 DIMENSIONS

Series 387 Inline Modular Dual Pump Skid



Front



Side

	Dimensions					Weight[1]
	A inches mm	**B** inches mm	**C** inches mm	**D** inches mm	**E** inches mm	**Approximate (Each)** lb kg
Series 387A	80.00 2032	64.00 1626	96.00 2438	100.00 2540	104.00 2642	577.7 262.0
Series 387B	102.00 2591	102.00 2591	96.00 2438	100.00 2540	104.00 2642	1647.7 747.2

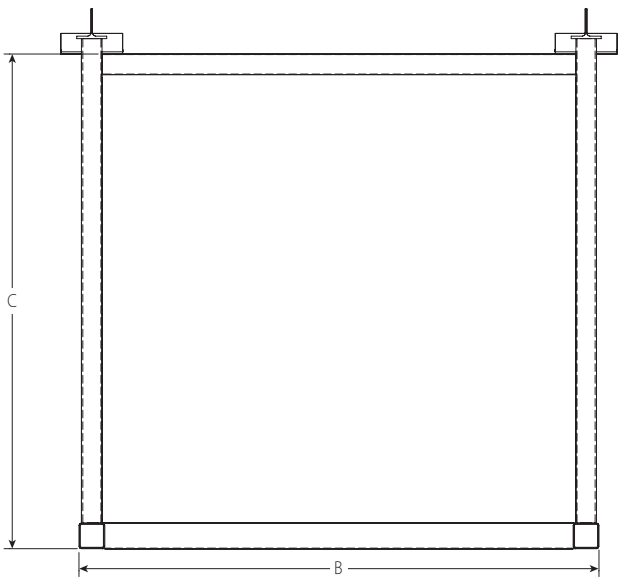
[1] Weight listed does not include the pumps.

NOTES

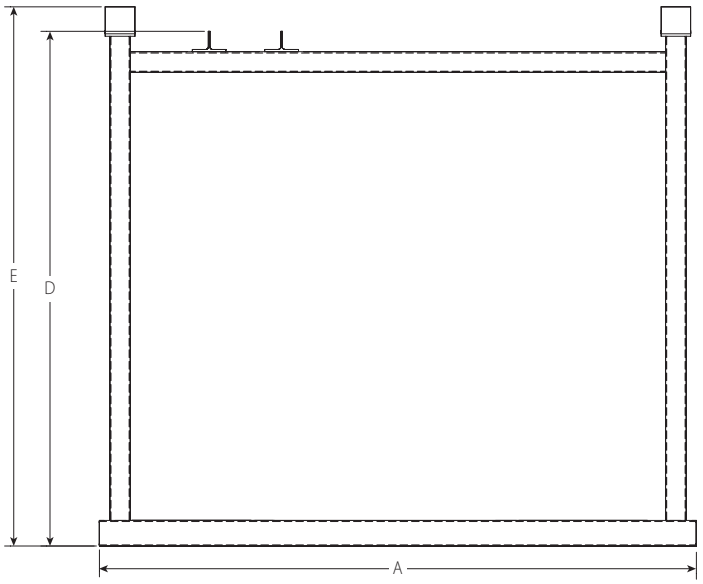
- Series 387A: For inline pump connection size 3"
- Series 387B: For inline pump connection sizes 4 – 10"

4.1 DIMENSIONS

Series 388 End Suction Modular Dual Pump Skid



Front



Side

	Dimensions					Weight[1]
	A inches mm	**B** inches mm	**C** inches mm	**D** inches mm	**E** inches mm	**Approximate (Each)** lb kg
Series 388A	80.00 2032	70.00 1778	96.00 2438	100.00 2540	105.00 2667	614.1 278.5
Series 388B	116.00 2946	101.00 2565	96.00 2438	100.00 2540	105.00 2667	1503.7 682.0

[1] Weight listed does not include the pumps.

NOTES

- Series 388A: For end suction pump connection sizes 2 ½ – 3 ½"
- Series 388B: For end suction pump connection sizes 4 – 10"

5.0 COMPONENT PERFORMANCE

Butterfly Valve Flow Characteristics

C_v/K_v values for flow of water at +60°F/+16°C with various disc positions are shown in the table below.

Formulas for C_v/K_v values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

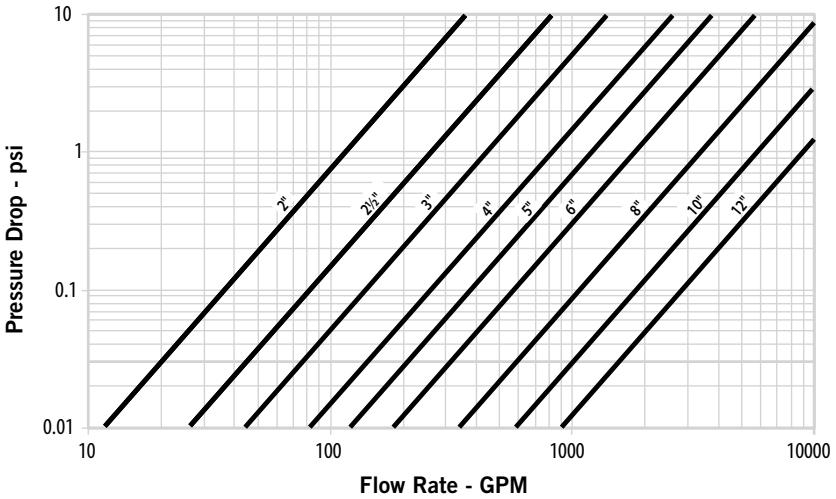
$$Q = K_v \times \sqrt{\Delta P}$$

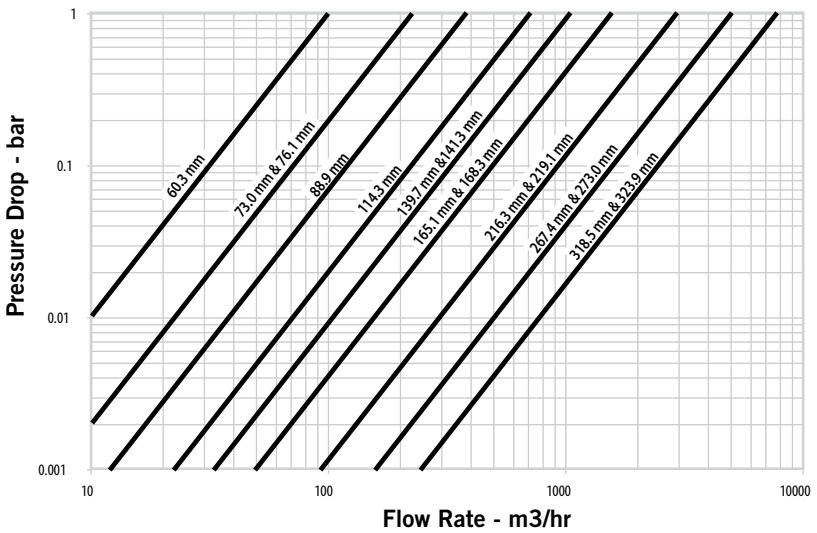
Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

Size		(Full Open)
Nominal inches DN	**Actual Outside Diameter** inches mm	C_v K_v
3 DN80	3.500 88.9	440 379
4 DN100	4.500 114.3	820 707
5 DN125	5.563 141.3	1200 1034
6 DN150	6.625 168.3	1800 1552
8 DN200	8.625 219.1	3400 2931
10 DN250	10.750 273.0	5800 5000

5.0 COMPONENT PERFORMANCE (CONTINUED)

Butterfly Valve Flow Characteristics





Size		Flow Coefficients					
		Disc Position (Degrees Open)					
		90	70	60	50	40	30
Nominal inches DN	Actual Outside Diameter inches mm	 Cv Kv	 Cv Kv	 Cv Kv	 Cv Kv	 Cv Kv	 Cv Kv
3 DN80	3.500 88.9	440 379	230 198	140 121	90 78	50 43	26 22
4 DN100	4.500 114.3	820 707	430 371	250 216	160 138	100 86	50 43
5 DN125	5.563 141.3	1200 1034	620 534	370 319	240 207	140 121	70 60
6 DN150	6.625 168.3	1800 1552	940 8190	560 483	360 310	220 190	110 95
8 DN200	8.625 219.1	3400 2931	1770 1526	1050 905	670 578	410 353	200 172
10 DN250	10.750 273.0	5800 5000	3020 2603	1800 1552	1150 991	700 603	350 302

5.1 COMPONENT PERFORMANCE

Check Valve Flow Characteristics

Cv/Kv values for flow of water at +60°F/+16°C at full open are shown in the table below.

Formulas for Cv/Kv values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

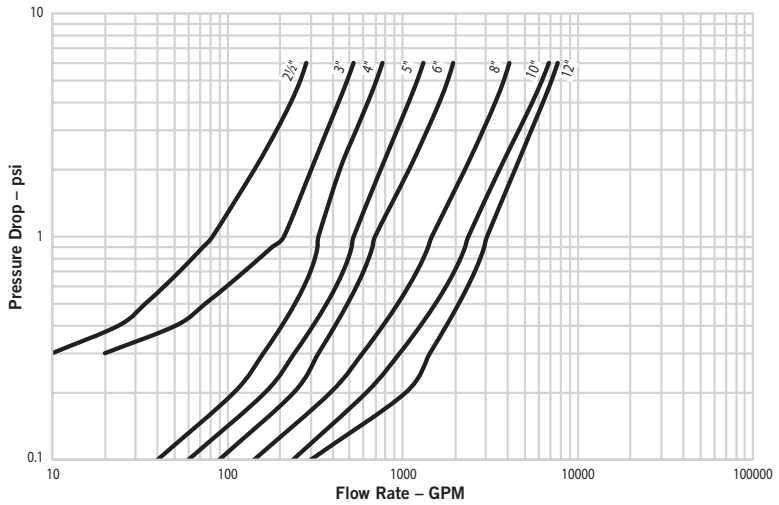
Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

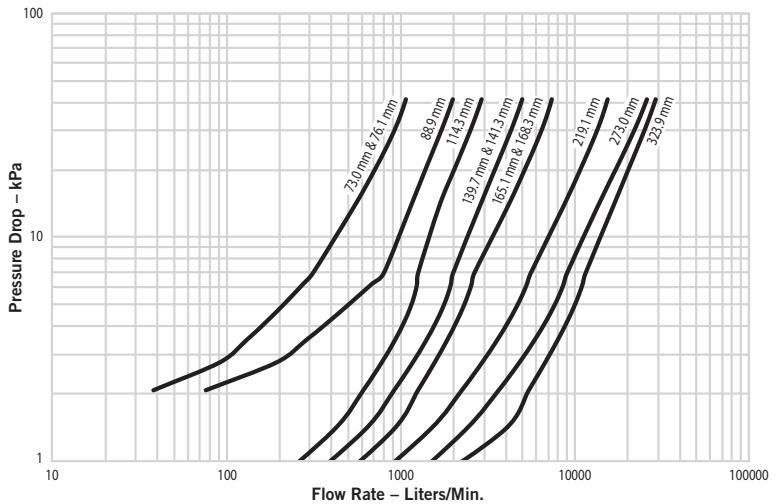
$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

Size			Size		
Nominal inches DN	**Actual Outside Diameter** inches mm	**(Full Open)** Cv Kv	**Nominal** inches DN	**Actual Outside Diameter** inches mm	**(Full Open)** Cv Kv
3 DN80	3.500 88.9	315 273	8 DN200	8.625 219.1	1800 1557
4 DN100	4.500 114.3	390 337	10 DN250	10.750 273.0	3000 2595
5 DN125	5.563 141.3	700 606			
6 DN150	6.625 168.3	1000 865			





5.2 COMPONENT PERFORMANCE

Suction Diffuser Flow Characteristics

Formulas for C_v/K_v values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

Size						Flow Data	C_v K_v
Nominal inches DN			Actual Outside Diameter inches mm				
3 DN80	x	2 DN50	3.500 88.9	x	2.375 60.3	A	79 68
		2½			2.875 73.0	A	79 68
		3 DN80			3.500 88.9	B	90 79
4 DN100	x	2½	4.500 114.3	x	2.875 73.0	D	144 125
		3 DN80			3.500 88.9	D	144 125
		4 DN100			4.500 114.3	E	161 139
5	x	2½	5.563 141.3	x	2.875 73.0	F	206 178
		3 DN80			3.500 88.9	F	206 178
		4 DN100			4.500 114.3	G	232 200
		5			5.563 141.3	H	251 217
6 DN150	x	3 DN80	6.625 168.3	x	3.500 88.9	I	295 255
		4 DN100			4.500 114.3	I	295 255
		5			5.563 141.3	J	361 312
		6 DN150			6.625 168.3	J	361 312
8 DN200	x	4 DN100	8.625 219.1	x	4.500 114.3	L	509 440
		5			5.563 141.3	L	509 440
		6 DN150			6.625 168.3	M	575 497
		8 DN200			8.625 219.1	N	642 555
10 DN250	x	6 DN150	10.750 273.0	x	6.625 168.3	O	821 710
		8 DN200			8.625 219.1	P	917 793
		10 DN250			10.750 273.0	Q	1003 867

5.2 COMPONENT PERFORMANCE (CONTINUED)

Suction Diffuser Flow Characteristics

Formulas for C_v/K_v values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

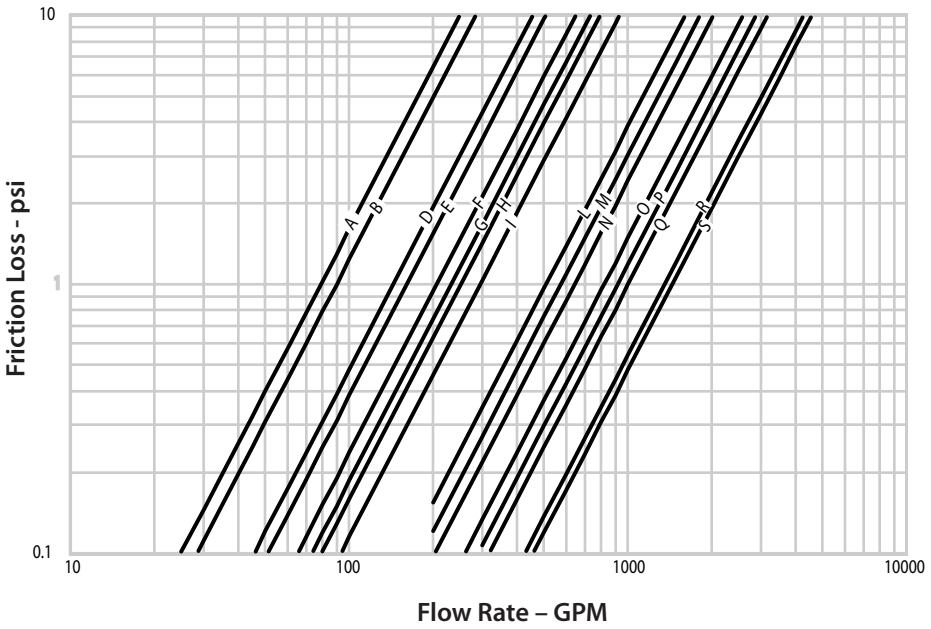
$$Q = C_v \times \sqrt{\Delta P}$$

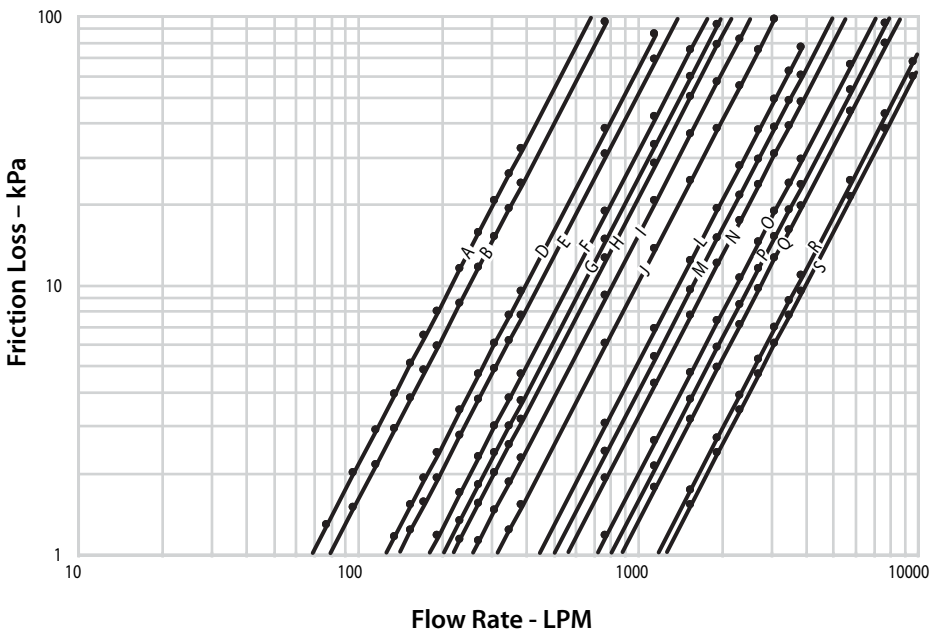
Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient





5.3 COMPONENT PERFORMANCE

Strainer Flow Characteristics

Cv/Kv values for flow of water at 60°F/16°C are shown in tables below.

Formulas for Cv/Kv values:

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (GPM)
ΔP = Pressure Drop (psi)
C_v = Flow Coefficient

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:
Q = Flow (m^3/hr)
ΔP = Pressure Drop (Bar)
K_v = Flow Coefficient

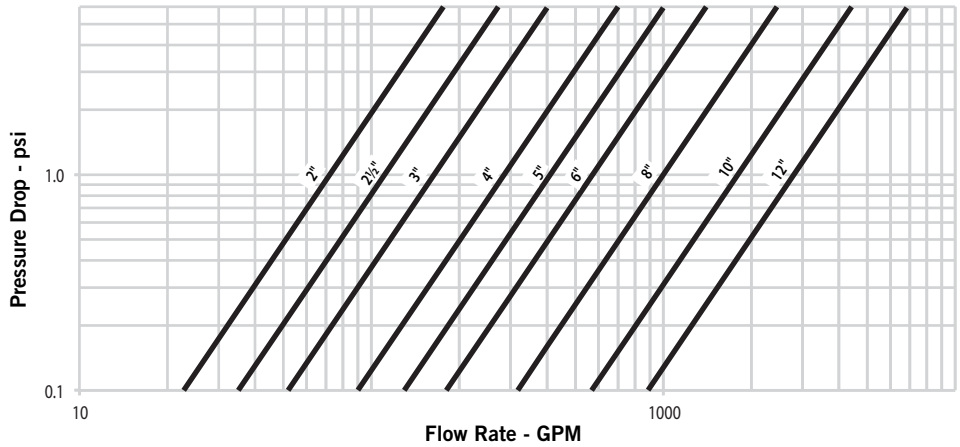
Size		
Nominal inches DN	**Actual Outside Diameter** inches mm	Cv Kv
3 DN80	3.500 88.9	164 142
4 DN100	4.500 114.3	285 247
5 DN125	5.563 141.3	410 355
6 DN150	6.625 168.3	597 516
8 DN200	8.625 219.1	1000 862
10 DN250	10.750 273.0	1800 1557

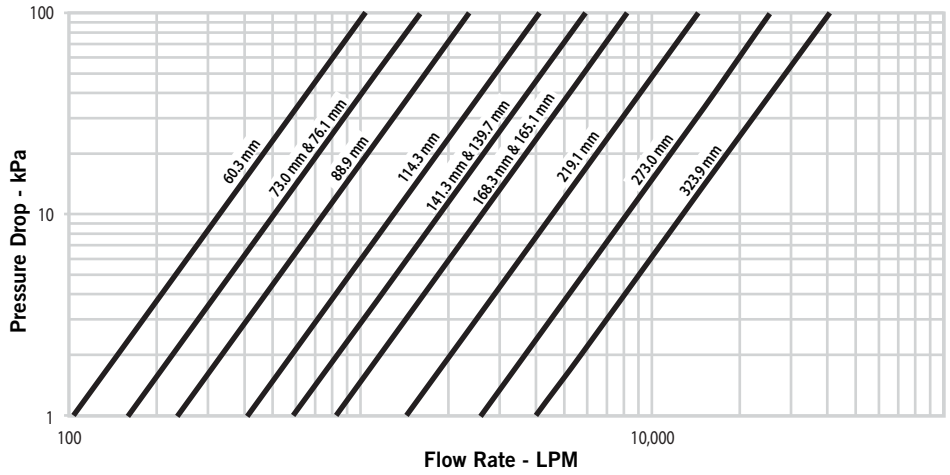
5.3 COMPONENT PERFORMANCE (CONTINUED)

Strainer Flow Characteristics

Flow characteristics are based on standard, clean baskets. Flow may vary from these figures.

The charts below expresses the flow of water at 65ºF/18ºC through strainer.





5.4 COMPONENT PERFORMANCE

Balancing Valve Flow Characteristics

Size		Min Flow	Nominal Range of Flow	Max Flow
Nominal inches DN	Actual Outside Diameter inches mm	GPM LPM	GPM LPM	GPM LPM
3 DN80	3.500 88.9	1.5 5.7	31.0 – 130.0 117.0 – 493.0	410.0 1551.9
4 DN100	4.500 114.3	1.9 7.2	68.0 – 200.0 257.0 – 757.0	650.0 2460.3
5	5.563 141.3	4.2 15.9	90.0 – 320.0 341.0 – 1211.0	1020.0 3860.7
6 DN150	6.625 168.3	5.0 18.9	182.0 – 450.0 689.0 – 1703.0	1430.0 5214.6
8 DN200	8.625 219.1	30.0 113.6	367.0 – 820.0 1389.0 – 3104.0	2600.0 9841.0
10 DN250	10.750 273.0	70.0 265.0	540.0 – 1300.0 2044.0 – 4921.0	4040.0 15291.4

NOTE

- For more information, please refer to publication 08.16: Victaulic Balancing Valves: TA Series 786H/787H.788.789 and Series 78KH.

5.5 COMPONENT PERFORMANCE

Flow Data – Frictional Resistance

The chart expresses the frictional resistance of Victaulic tees as equivalent feet of straight pipe.

Size		Dimensions	
		Tees	
Nominal inches DN	Actual Outside Diameter inches mm	Branch feet meters	Run feet meters
3 DN80	3.500 88.9	13.0 4.0	5.0 1.5
4 DN100	4.500 114.3	16.0 4.9	6.8 2.1
5	5.563 141.3	21.0 6.4	8.5 2.6
6 DN150	6.625 168.3	25.0 7.6	10.0 3.0
8 DN200	8.625 219.1	33.0 10.1	13.0 4.0
10 DN250	10.750 273.0	41.0 12.5	17.0 5.2

5.5 COMPONENT PERFORMANCE (CONTINUED)

Flow Data – Frictional Resistance

Base Support Elbows

The chart expresses the frictional resistance of Victaulic base support elbows as equivalent feet of straight pipe.

Size		Base Support Elbows feet meters
Nominal inches DN	**Actual Outside Diameter** inches mm	
3 DN80	3.500 88.9	3.8 1.2
4 DN100	4.500 114.3	5.0 1.5
6 DN150	6.625 168.3	7.5 2.3
8 DN200	8.625 219.1	9.8 3.0
10 DN250	10.750 273.0	12.0 3.7
12 DN300	12.750 323.9	14.5 4.4

Reducing Base Support Elbows

The chart expresses the frictional resistance of Victaulic reducing base support elbows as equivalent feet of straight pipe.

Size						Reducing Base Support Elbows[2] feet meters
Nominal inches DN			**Actual Outside Diameter** inches mm			
4 DN100	x	3 DN80	4.500 114.3	x	3.500 88.9	5.3 1.6
5	x	4 DN100	5.563 141.3	x	4.500 114.3	6.4 2.0
6 DN150	x	3 DN80	6.625 168.3	x	3.500 88.9	14.9 4.5
		4 DN100			4.500 114.3	9.1 2.8
		5			5.563 141.3	7.9 2.4
8 DN200	x	4 DN100	8.625 219.1	x	4.500 114.3	19.4 5.9
		5			5.563 141.3	12.8 3.9
		6 DN150			6.625 168.3	10.9 3.3
10 DN250	x	6 DN150	10.750 273.0	x	6.625 168.3	15.6 4.8
		8 DN200			8.625 219.1	13.2 4.0
12 DN300	x	8 DN200	12.750 323.9	x	8.625 219.1	16.4 5.0
		10 DN250			10.750 273.0	15.4 4.7

[2] The equivalent length presented here is for the larger end size pipe diameter.

6.0 NOTIFICATIONS

⚠ WARNING

- **Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

06.23: Victaulic QuickVic™ Rigid Coupling Style 107N
06.24: Victaulic QuickVic™ Flexible Coupling Style 177N
07.01: Victaulic Grooved End Fittings
07.13: Victaulic Base Support Elbows
102.10: Victaulic Discharge Vibration Isolation Pump Drop Series 380/380G
102.11: Victaulic Suction Vibration Isolation Pump Drop Series 381/381G
102.12: Victaulic Strainer Vibration Isolation Pump Drop Series 382/382G
102.13: Victaulic Discharge CBV Vibration Isolation Pump Drop Series 383/383G
I-100 Field Installation Handbook

