Venturi Brochure

Product Overview

CLASSICAL STYLE VENTURI TUBES
CATALOG 4200

- **Increased accuracy**
- **Low erosion**
- **High pressure recovery**

Daniel has designed its Classical Style Venturi Tubes to meet each customer's specific flow measurement needs with engineering that covers a wide range of applications. These maintenance free tubes offer a constant degree of accuracy, a low susceptibility to erosion, high pressure recovery, and they can be installed at any angle from horizontal to vertical.

Daniel manufactures venturi tubes in sizes ranging from 2" to 48" and larger in accordance with A.S.M.E. Standard MFC-3M 1985. Customers can specify tubes for high and low pressures, volumes, and temperatures. Construction materials include carbon, alloy, and stainless steels. Daniel can supply other materials on request for special applications.

Throughout the manufacturing process, skilled machinists and welders proceed according to A.S.M.E.-approved procedure specifications with supporting procedure qualification records. Daniel has A.S.M.E. authorization to use the "PP" (Power Piping) code symbol. Stringent inspection procedures assure conformity to code or customer specifications.

Daniel manufactures its venturi tubes to have an accuracy of ±1%* uncalibrated and ±25%* for a calibrated venturi tube and pipe section.

VERSATILE

- Can be used in air, water, vapor, steam, gas, chemical, sludge, and slurry applications.
- Available in carbon, alloy, and stainless steels as well as other materials, based on request and design stability.

ECONOMICAL

- Short upstream piping required.
- No moving parts, simple configuration, maintenance-free.
- Lower susceptibility to erosion.
- Lighter than cast type, fabricated from plate, pipe, and bar stock.
- Lower installation costs.

EFFICIENT

- High pressure recovery.
- Sustained accuracy*.
- Wide rangeability--will operate down to 200,000 pipe Reynolds number. Daniel recommends laboratory flow calibrations below 200,000 pipe Reynolds number.
- High repeatability due to simple configurations and no moving parts.

*Accuracy contingent upon proper installation and on Beta Ratio and Reynolds number.

Venturi Numbering System

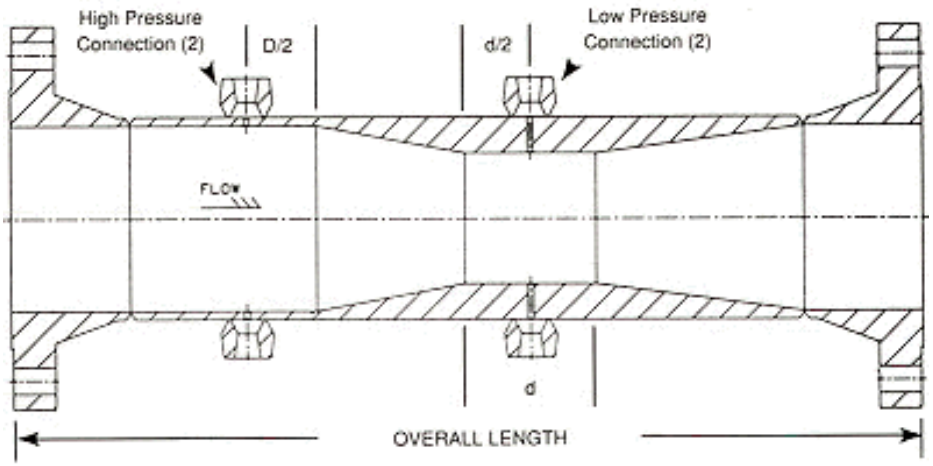
8" -- 42 0 3 -- A -- D

Code	Explanation/Example
8"	Nominal diameter of line in which Venturi is installed
42	Product Number
0	End Connections 8 Beveled for welding both ends 0 Raised face flanges both ends 4 Ring-type joint flanges both ends
3	ANSI Class 0 Unrated 1 Class 150 3 Class 300 4 Class 400 5 Class 600 6 Class 900 7 Class 1500 8 Class 2500
A	Form A Short Form B Long Form
D	Style C Machined style* D Fabricated style

*Available in sizes 6" and smaller.

Short Form Venturi Tube

TYPICAL SPECIFICATIONS, SHORT FORM VENTURI TUBES



			OVERALL LENGTH (APPROX.)			WEIGHT (LBS) (APPROX.)	
LINE SIZE	BETA RATIO	BEVEL ENDS	150# FLANGES	300# FLANGES	BEVEL ENDS	150# FLANGES	300# FLANGES
4" - 40	0.40	21 3/8	27 3/8	28 1/8	21	53	73
4.026	0.55	18	24	24 3/4	19	51	71
I.D.	0.70	14 5/8	20 5/8	21 3/8	15	47	67
6" - 40	0.40	32 1/8	39 1/8	39 7/8	56	106	146
6.065	0.55	27 1/8	34 1/8	34 7/8	47	97	137
I.D.	0.70	22 1/8	29 1/8	29 7/8	40	90	130
8" - 40	0.40	42 1/4	50 1/4	51	112	192	252
7.481	0.55	35 3/4	43 3/4	44 1/2	96	176	236
I.D.	0.70	29 1/8	37 1/8	37 7/8	81	161	221
10" - 40	0.40	53	61	62 1/4	199	311	387
10.020	0.55	44 7/8	52 7/8	54 1/8	171	283	359
I.D.	0.70	36 1/2	44 1/2	45 3/4	143	255	331
12" - Std.	0.40	63 1/2	72 1/2	73 3/4	291	463	571
12.000	0.55	55 5/8	64 5/8	65 7/8	250	422	530
I.D.	0.70	43 3/4	52 3/4	54	209	381	489
14" - Std.	0.40	70 1/8	80 1/8	81 3/8	353	575	733
13.250	0.55	59 1/4	69 1/4	70 1/2	304	526	684
I.D.	0.70	48 3/8	58 3/8	59 5/8	254	476	634
16" - Std.	0.40	80 3/4	90 3/4	92 1/4	466	748	966
15.250	0.55	68 1/4	78 1/4	79 3/4	400	682	900
I.D.	0.70	55 5/8	65 5/8	67 1/8	335	617	835
18" - Std.	0.40	91 3/8	102 3/8	103 7/8	594	900	1204

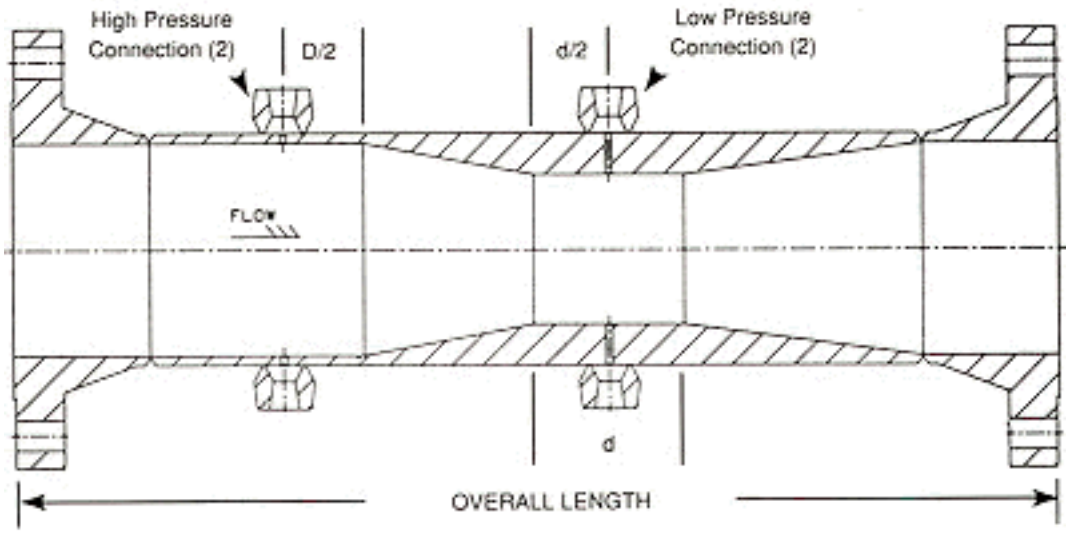
17.250	0.55	77 1/8	88 1/8	89 5/8	510	816	1120
I.D.	0.70	63	74	75 1/2	426	732	1036
20" - Std.	0.40	102	113 3/8	114 3/4	736	1112	1496
19.250	0.55	86 1/8	97 1/2	98 7/8	632	1008	1392
I.D.	0.70	70 1/4	81 5/8	83	529	905	1289
24" - Std.	0.40	112 1/8	124 1/8	125 3/8	1070	1610	2150
23.250	0.55	104	116	117 1/4	919	1459	1999
I.D.	0.70	84 7/8	96 7/8	98 1/8	767	1307	1847
30" - Std.	0.40	155			1661		
29.250	0.55	130 7/8			1422		
I.D.	0.70	106 3/4			1184		
36" - Std.	0.40	186 1/4			2374		
35.250	0.55	157 5/8			2028		
I.D.	0.70	128 5/8			1683		
42" - Std.	0.40	218 1/2			3216		
41.250	0.55	184 1/2			2742		
I.D.	0.70	150 1/2			2270		
48" - Std.	0.40	250 1/4			4184		
47.250	0.55	211 3/8			3564		
I.D.	0.70	172 3/8			2944		

NOTE: All dimensions and weights are approximate and subject to change without notice.
Other line I.D.'s available on request. Minimum pipewall in 8" sizes and larger is .250".

DANIEL Industries, Inc.

Long Form Venturi Tube

TYPICAL SPECIFICATIONS, LONG FORM VENTURI TUBES



LINE SIZE	BETA RATIO	OVERALL LENGTH (APPROX.)	WEIGHT (LBS.) (APPROX.)
4" - 40	0.40	31 7/8	28
4.026	0.55	25 7/8	22
I.D.	0.70	19 7/8	17
6" - 40	0.40	48 1/8	80
6.065	0.55	39 1/8	66
I.D.	0.70	30 1/8	53
8" - 40	0.40	63 1/4	162
7.481	0.55	51 1/2	134
I.D.	0.70	39 1/2	106
10" - 40	0.40	79 2/3	288
10.020	0.55	64 5/8	238
I.D.	0.70	49 5/8	188
12" - Std.	0.40	95	421
12.000	0.55	79 1/4	348
I.D.	0.70	59 1/2	274
14" - Std.	0.40	105	512
13.250	0.55	85 3/8	422
I.D.	0.70	65 3/4	333

16" - Std.	0.40	120 3/4	674
15.250	0.55	98 1/4	557
I.D.	0.70	75 5/8	439
18" - Std.	0.40	136 5/8	860
17.250	0.55	111 1/8	710
I.D.	0.70	85 5/8	559
20" - Std.	0.40	152 1/2	1066
19.250	0.55	124	880
I.D.	0.70	95 1/2	693
24" - Std.	0.40	173 1/4	1557
23.250	0.55	149 3/4	1279
I.D.	0.70	115 1/2	1008
30" - Std.	0.40	231 3/4	2419
29.250	0.55	188 1/2	1991
I.D.	0.70	145 1/8	1562
36" - Std.	0.40	278 7/8	3475
35.250	0.55	227 1/8	2854
I.D.	0.70	174 7/8	2232
42" - Std.	0.40	326 3/4	4719
41.250	0.55	265 3/4	3870
I.D.	0.70	204 5/8	3021
48" - Std.	0.40	374 3/8	6156
47.250	0.55	304 1/2	5043
I.D.	0.70	234 1/2	3931

NOTE: All dimensions and weights are approximate and subject to change without notice.
Other line I.D.'s available on request. Minimum pipewall in 8" sizes and larger is .250".

Piping Requirements for Daniel Venturi Tubes

Diameter Ratio	Single 90° Short Radius Bend	Two or More 90° Bends in the Same Plane (Note 1)	Two or More 90° Bends in Different Plane (Note 2)	Reducer 3*D* to *D* Over a Length of 3.5*D*	Expander 0.75*D* to *D* Over a Length of *D*	Ball or Gate Valve Fully Open
0.30	1.0	1.0	1.0	1.0	1.0	1.0
0.35	1.0	1.0	1.0	1.0	1.0	1.0
0.40	1.0	1.0	1.0	1.0	1.0	3.0
0.45	1.0	1.0	1.0	1.0	2.0	3.0
0.50	1.0	3.0	17.0	1.0	3.0	3.0
0.55	1.0	3.0	25.0	1.0	3.0	5.0
0.60	2.0	5.0	35.0	1.0	3.0	5.0
0.65	3.0	5.0	47.0	3.0	5.0	5.0
0.70	4.0	5.0	55.0	5.0	7.0	7.0
0.75	6.0	7.0	59.0	7.0	9.0	7.0

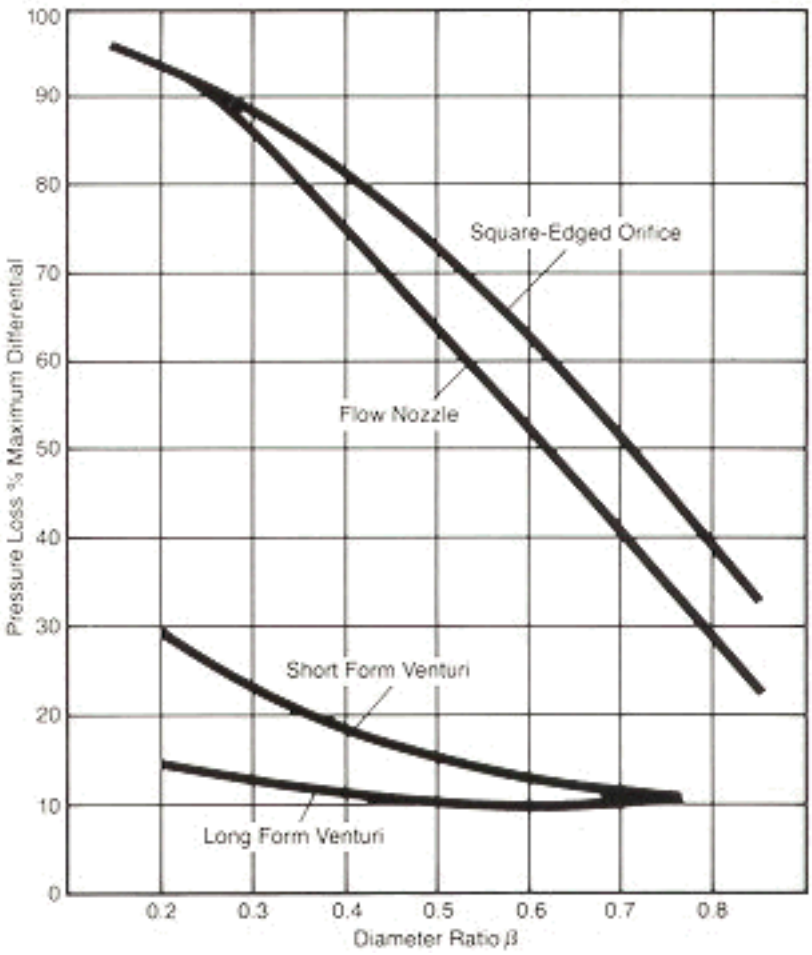
NOTES:

1. Inserting 5D to 10D of straight pipe between bends will allow use of lengths in the left column (single bend).
2. Recommended downstream straight lengths. Fittings and other disturbances as indicated in the above table, situated at least 4 throat diameters downstream of the throat tap, do not affect the accuracy of the measurement.

Overall Pressure Loss Through Several Primary Elements

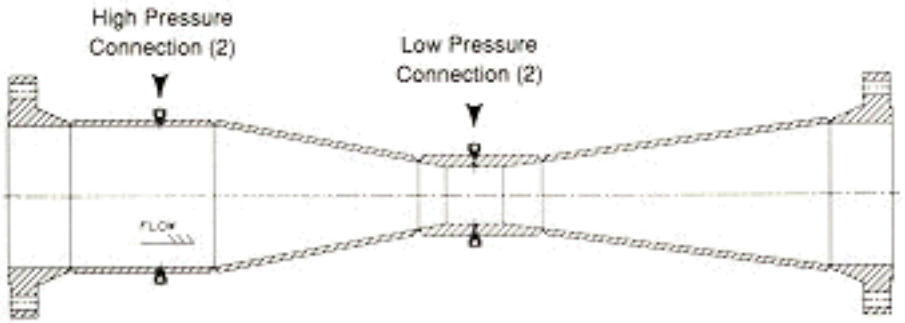
OVERALL PRESSURE LOSS THROUGH SEVERAL PRIMARY ELEMENTS

With today's emphasis on energy conservation, the venturi tube shows its efficiency in this chart. The venturi is outstanding at measuring high or low volumes at high or low pressures at high or low temperatures, but its primary use is in low static line pressure applications where high pressure recovery is necessary.

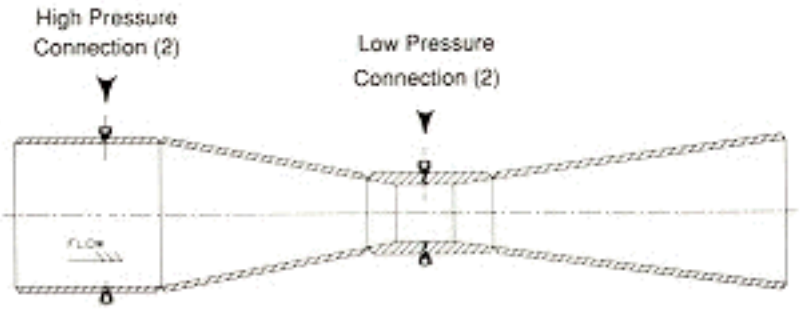


Representative Schematics

FABRICATED TYPE WITH FLANGED ENDS
(2 sets taps standard)

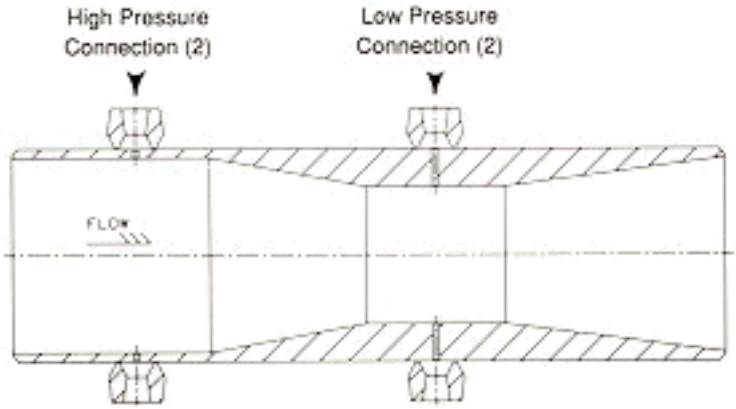


WELD-END TYPE

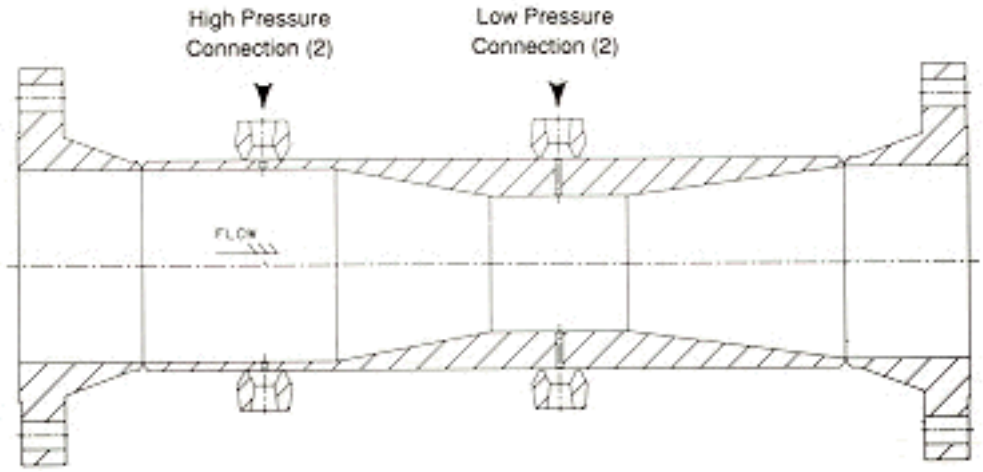


MACHINED STYLE WITH WELD ENDS

(6" and below)



MACHINED STYLE WITH FLANGED ENDS



Classical Style Venturi Tubes

CATALOG 4200

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DANIEL Flow Products

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