DANIEL®

WEDGE METER
PRODUCT GUIDE

PRIMARY FLOW ELEMENTS

Decades Proven. Field Chosen.™

The wedge meter is a differential producer primary element that offers reliable performance in a wide range of process conditions.

OVERVIEW

This Measurement provides a complete line of wedge meter primary elements that are specifically designed to meet your measurement needs. To maximize operational longevity and product performance, all Daniel wedge meters are built to ISO standards.

While the wedge meter can handle clean liquid, gas and steam, the meter particularly excels at difficult to measure abrasive, corrosive, solid-laden and viscous fluids or fluids that tend to easily foul, that other DP primary elements cannot accurately measure or withstand the wear and tear. Common applications for wedge meters include asphalt, cement, tar-sands, sewage systems, fracking fluids, wastewater and many, other industrial and petrochemical applications where abrasive and/or corrosive fluids need to be measured.

FEATURES

- High accuracy of ±0.5%, Repeatability of ±0.2%
- Wide range of pipe sizes available from 2” to 24”
- End configuration available in flanged, threaded, beveled, hubs and welded
- All grades of SS, Duplex SS, Carbon Steel and other construction materials available by request

BENEFITS

- Engineered V-shaped wedge allows for solids and sludge to pass through without build-up.
- Long Term Durability - tried and true design, no moving parts or sensitive instrumentation.
- Dynamic Capability - ability to measure liquid, mixed gas flow and highly contaminated, abrasive and corrosive slurries.
- Bidirectional Flow Capability - option to measure flow from either direction.
- Designed to withstand high-pressure and high-temperature conditions.

FUNDAMENTALS

PRINCIPLE OPERATION

The wedge meter consists of a length of pipe with an inset, engineered V-shaped wedge. The internal restriction of the wedge is designed to create a differential pressure, which is used to calculate the flow rate using Bernoulli's principle.

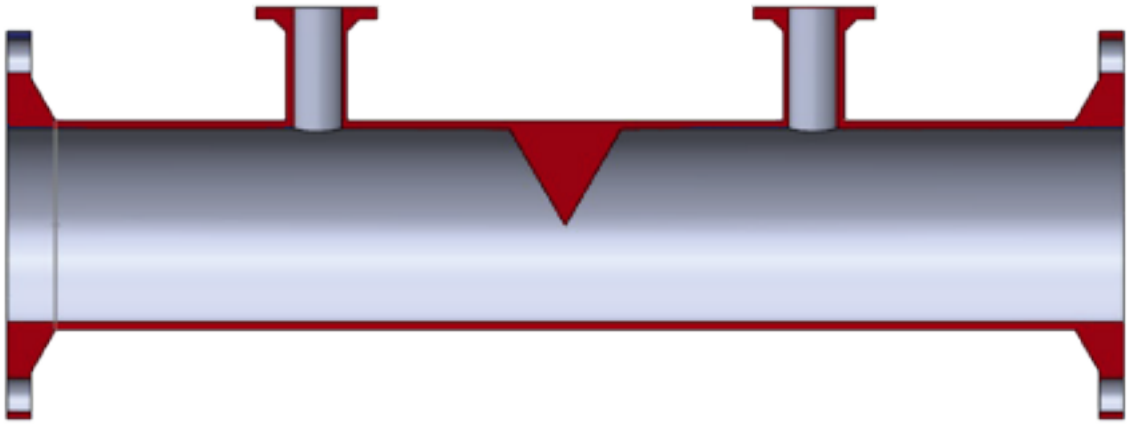
$$Q = K_c \times \sqrt{\Delta P}$$

Where:

- Q Flow Rate
- K_c Proportionality Constant
- ΔP Measured Differential Pressure

Pressure taps positioned on the upstream and downstream sides of the wedge are tailor-made to meet your needs, from ½" NPT threads for smaller wedge meters to larger, remote seals for high volume slurries or corrosive fluids. Daniel can also provide flushing rings for remote pressure seal maintenance and cleaning upon request.

The flow range for the meter is designed by specifying the H/D ratio or Beta ratio, which is the relationship between pipe ID and height of the wedge. See the wedge meter diagram in **Figure 1** for additional details.



Consult the Daniel engineering team to select the proper dimensions, Beta ratio and construction materials to design the correct wedge meter for your application.

SPECIFICATIONS

PERFORMANCE AND PHYSICAL SPECIFICATIONS	
Standard Accuracy	Calibrated: ± 0.5%; Uncalibrated: ±5.0% of actual flow
Flow Ranges (turndown)	10:1 or greater
Repeatability	± 0.2% or better
Permanent Pressure Loss	Varies with DP and Beta (H/D) Ratio
Beta Ratio	0.2, 0.3, 0.4, 0.5; Additional betas available by request.
Line Sizes and Pressure Ratings	2" to 24" – ANSI 150# thru 2500# 26"and larger – available in any flange specification.
Construction Materials	All Grades of Stainless Steel, Carbon Steel and Alloys or any other weldable material
End Configuration	Wafer, Flanged, Beveled, Threaded and Others

Daniel offers tailor-made solutions for your metering needs. Daniel wedge meters are built according to ISO 5167-4. All components are customizable to fit your specific system, just ask our engineering team and we will find the solution.

PIPING INTALLATION REQUIREMET

Daniel follows the recommended ISO 5167-6 guidelines for wedge meter installation. The length of straight pipe required before entering the meter is dependent on the upstream flow system and internal diameter of the pipe. Differential upstream system configurations and the corresponding lenght of straight pipe required are shown in **Table 1.**

TABLA 1: RECOMMENDED UPSTREAM LENGTHS FOR FLOW DISTURBERS	
Single 90° bend	7D
Three 90° bends with parallel exit and oulet	22D
Two 90° bends in the same plane	21D
Concetric expander (D/2 to D)	7D
Concetric reducer (3D/2 to D)	7D
Partially closed valve	15D
Pipe tee - straight run	7D
Pipe tee - used as elbow or tee	8D

WEDGE METER

ORDERING INFORMATION

TO PLACE AN ORDER

Review the wedge meter catalog and select one option from each of the categories below to identify the part number for your application. Provide the part number to Daniel for a detailed quote at sales@daniel.com

WEDGE METER - WGM PART NUMBER STRING (1 OF 2)

WGM	XX	X	XX	XX

Pipe Size

2"	02
3"	03
4"	04
6"	06
8"	08
10"	10
12"	12
14"	14
16"	16
18"	18
20"	20
24"	24
Larger	XX

End Configuration

Flanged	F
Beveled	B
Wafer	W
Other	X

Wedge Material

304/L Stainless	34
316/L Stainless	36
Carbon Steel	CS
Low Temp Carbon Steel	LT
Other	XX

Body Material

304/L Stainless	34
316/L Stainless	36
Carbon Steel	CS
Low Temp Carbon Steel	LT
Other	XX

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WEDGE METER - WGM PART NUMBER STRING (2 OF 2)

WGM	XX	X	XX	XX	X	X	X	X	X

Pipe Schedule

Standard	1
X-StrongWall	2
Other	X

Process Connection

ANSI 150# Flange	1
ANSI 300# Flange	2
ANSI 600# Flange	3
ANSI 900# Flange	4
ANSI 1500# Flange	5
ANSI 2500# Flange	6

Instrument Connection

¼" NPT or SW	1
½" NPT or SW	2
2" Flange Connection	3
3" Flange Connection	4
Chemical-Tee	5
Other	X

Calibration

None	0
Hydro	1
Hydro (bidirectional)	2
Other	X

NDE Testing

Visual Inspection	0
Hydrostatic	1
Radiography	2
Magnetic Particle/Dye Penetrant	3
PMI (SS only)	4
Other	X

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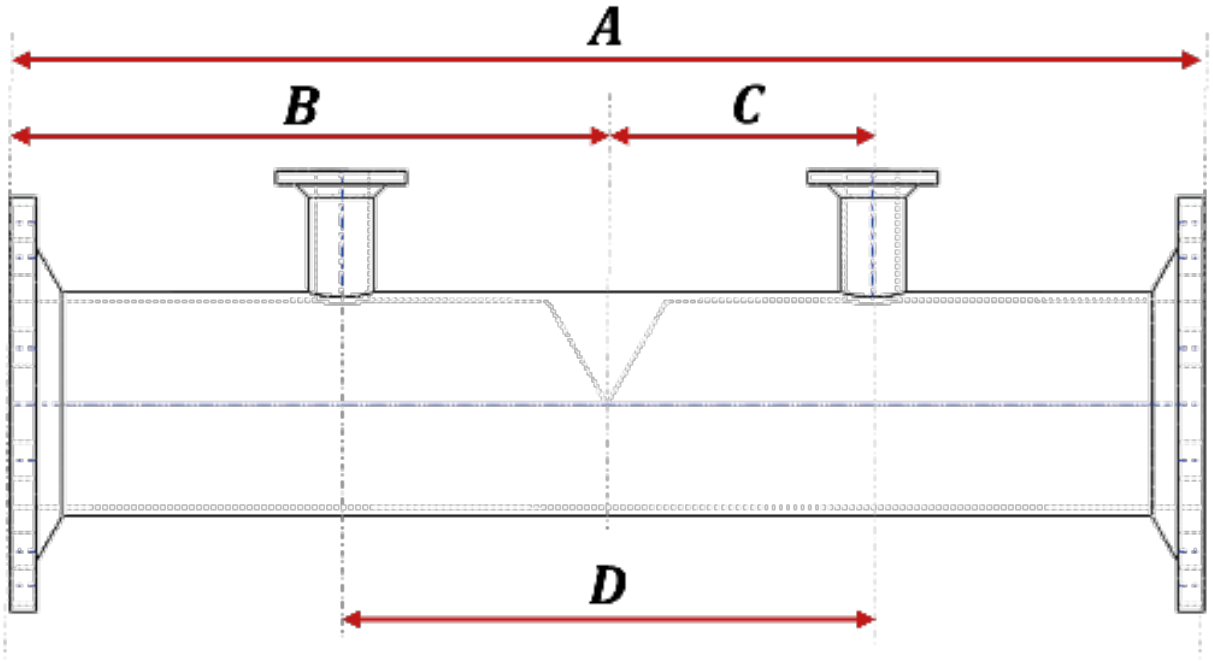
DIMENSIONS



Pipe Size	SECTION LENGTH (INCH / MM)					
	A	B	C	D	150#	300#
2"	28.00 / 711.20	14.00 / 355.60	04.93 / 125.22	09.26 / 235.20	51 / 23.13	55 / 24.95
3"	34.00 / 711.20	17.00 / 431.80	07.56 / 192.02	15.12 / 384.05	69 / 31.29	79 / 35.83
4"	36.00 / 914.40	18.00 / 457.20	07.50 / 190.50	15.00 / 381.00	91 / 41.27	109 / 49.43
6"	40.00 / 1066.80	20.00 / 508.00	09.00 / 228.60	18.00 / 457.20	115 / 52.15	155 / 70.29
8"	42.00 / 1066.80	21.00 / 533.40	10.25 / 260.35	20.50 / 520.70	140 / 63.49	198 / 89.79
10"	45.00 / 1143.00	22.50 / 571.50	11.75 / 298.45	23.50 / 596.90	206 / 93.42	286 / 129.70
12"	47.00 / 1193.80	23.50 / 596.90	13.25 / 336.55	26.50 / 673.10	280 / 126.98	394 / 178.68
14"	49.00 / 1244.60	24.50 / 622.30	14.00 / 355.60	28.00 / 711.20	347 / 157.36	517 / 234.46
16"	49.00 / 1244.60	24.50 / 622.30	15.25 / 387.35	30.50 / 774.70	430 / 195.01	644 / 292.05
18"	52.00 / 1320.80	26.00 / 660.40	16.75 / 425.45	33.50 / 850.90	496 / 224.94	790 / 358.27
20"	56.00 / 1422.40	28.00 / 711.20	18.50 / 469.90	37.00 / 939.80	615 / 278.90	973 / 441.26
24"	62.00 / 1574.80	31.00 / 787.40	21.00 / 533.40	42.00 / 1066.80	848 / 384.57	1192 / 540.57

Weights are based on Schedule 40 pipe. Additional pipe schedules, flange specifications and larger pipe diameters are available by request.

With over 90 years of experience, Daniel is the only manufacturer that has the knowledge and experience to engineer and offer superior products that are trusted to provide the most reliable and accurate measurements in the global oil and gas industry.

Contact Us
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