The McCrometer V-Cone Flowmeter technology accurately measures flow over a wide range of Reynolds numbers, under all kinds of conditions and for a variety of fluids. It operates on the same physical principle as other differential pressure-type flowmeters, using the theory of conservation of energy in fluid flow through a pipe. The V-Cone’s remarkable performance characteristics, however, are the result of its unique design. It features a centrally-located cone inside the tube. The cone interacts with the fluid flow, reshaping the fluid’s flow profile and creating a region of lower pressure immediately downstream of itself. The pressure difference, exhibited between the static line pressure and the low pressure created downstream of the cone, can be measured via two pressure sensing taps. One tap is placed slightly upstream of the cone, the other is located in the downstream face of the cone itself. The pressure difference is then incorporated into a derivation of the Bernoulli equation to determine the fluid flow rate.

The cone’s central position in the line optimizes the velocity of the flow at the point of measurement, ensuring highly accurate, reliable flow measurement regardless of the flow condition upstream of the meter.
The V-Cone’s contour-shaped flow conditioner disrupts the flow prior to passing the cone. These short vortices create a low amplitude, high frequency signal for excellent signal conditioning disrupted outside wall effectively directs flow to the measurement ports. This allows the V-Cone to act as its own flow conditioner by disrupting the flow without impacting it against an abrupt surface. As a result, the V-Cone's ability to condition the flow prior to measurement results in another significant benefit: installation flexibility.

The key benefit to the V-Cone’s unique design is its ability to provide repeatable accuracy of up to ±0.5% of rate under laboratory conditions.

High Performance in ‘Real World’ Applications

McCrometer V-Cone is an innovative flowmeter that takes differential pressure flow measurement to another level. Designed for mild to harsh operating environments, and for a wide variety of fluids, this advanced flowmeter consistently outperforms traditional DP devices and other flow technologies. The V-Cone offers better accuracy and repeatability, wider rangeability, installation flexibility and reduced maintenance. Its performance is so outstanding, some users say it deserves a technology name all its own.

Accuracy You Can Count On

The V-Cone’s enhanced performance is due to the shape and position of the cone in relation to the measurement ports. This allows the V-Cone to act as its own flow conditioner by disrupting all controlled flow disturbances. This fully mixed and conditioned flow results in a low amplitude, high frequency signal with little “signal noise.” Readings are always precise and reliable including low pressure flow situations.

Maximum Installation Flexibility

The V-Cone’s ability to condition the flow prior to measurement results in another significant benefit: installation flexibility. Because the V-Cone can accurately measure disturbed flow, it doesn’t require the upstream or downstream straight pipe runs of many other flowmeters. This key feature means the V-Cone can be installed virtually anywhere in a piping system or easily retrofit into an existing piping layout. The result can be significant cost savings. It also means the V-Cone can fit where other flowmeters can’t due to limited space or weight requirements.

Low-to-No Operating Costs

The V-Cone assures long term performance. It has no moving parts to replace and in addition, the contoured shape of the cone directs the flow without impacting it against an abrupt surface. Instead, a boundary layer forms along the cone, directing flow away from the beta edge. Because the beta remains unchanged, the calibration of the meter is accurate for a much longer time, possibly indefinitely.

Flexible Design Meets Range of Needs

The V-Cone Flowmeter offers exceptional sizing flexibility. It can be sized for line diameters of 1/2” to over 120” and is available in a wide range of construction materials. The V-Cone Flowmeter offers exceptional sizing flexibility. It can be sized for line diameters of 1/2” to over 120”. An extensive variety of construction materials are also available.

McCrometer Application Support

At McCrometer, all we make are flowmeters. We have over 50 years of flow measurement experience in municipal, industrial and agricultural markets.

Our knowledgeable staff are accurately evaluate your flow application and specify the best metering technology for your specific flow condition. For an evaluation of your flow application or to find out about our other flowmeter products, contact your McCrometer representative today.
The V-Cone offers better accuracy and repeatability, wider reproducibility, installation flexibility and reduced maintenance. In performance is so outstanding, some users say it deserves a technology name all its own.

**Accuracy You Can Count On**

The key benefit to the V-Cone’s unique design is its ability to provide repeatable accuracy of up to ±0.3% of rate under even the most difficult flow conditions, and over a wide range of Reynolds numbers. Whether measuring swirling fluids or low pressure flows, the V-Cone delivers the accuracy and reliability other devices only achieve under laboratory conditions.

**Acts As Own Flow Conditioner**

The V-Cone’s enhanced performance is due to the shape and position of the cone in relation to the measurement ports. This allows the V-Cone to act as its own flow conditioner by disrupting all detrimental flow disturbances. This fully mixed and conditioned flow results in a low amplitude, high frequency signal with little “signal noise.” Readings are always precise and reliable, including low pressure flow situations.

**Maximum Installation Flexibility**

The V-Cone’s ability to condition the flow prior to measurement results in another significant benefit: installation flexibility. Because the V-Cone can accurately measure disturbed flow, it doesn’t require the upstream or downstream straight pipeline runs of many other flowmeters. This key feature means the V-Cone can be installed virtually anywhere in a piping system or easily retrofit into an existing piping layout. The result can be significant cost savings. It also means the V-Cone can fit where other flowmeters can’t due to limited space or weight requirements.

**Low-To-No Operating Costs**

The V-Cone assures long-term performance. It has no moving parts to replace and in addition, the contoured shape of the cone directs the flow without impacting it against an abrupt surface. Instead, a boundary layer forms along the cone, directing fluid away from the beta edge. Because the beta remains unchanged, the calibration of the meter is accurate for a much longer time, possibly indefinitely.

**Flexible Design Meets Range of Needs**

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**Performance Advantages**

- high accuracy
- high repeatability
- self conditioning
- minimum straight pipe requirements
- broad rangeability
- low headloss
- clean or dirty liquids, wet gases, slurry
- low signal noise
- virtually no maintenance
The V-Cone’s unique design allows it to provide repeatable accuracy of up to 0.3% of range under even the most difficult flow conditions, and over a wide range of Reynolds numbers. Whether measuring swirling fluids or low pressure flows, the V-Cone delivers the accuracy and reliability other devices only achieve under laboratory conditions. Acts As Own Flow Conditioner

The V-Cone’s enhanced performance is due to the shape and position of the cone in relation to the measurement ports. This allows the V-Cone to act as its own flow conditioner by disrupting the measurement results in another significant benefit: installation flexibility. Because the V-Cone can accurately measure disturbed flow, it doesn’t require the upstream or downstream straight pipe runs of many other flowmeters. This key feature means the V-Cone can be installed virtually anywhere in a piping system or easily retrofit into an existing piping layout. The result can be significant cost savings. It also means the V-Cone can fit where other flowmeters can’t due to limited space or weight requirements.

Low-to-No Operating Costs

The V-Cone offers exceptional versatility. It can be sized for flow diameters of 1/2” to over 120”. An extensive variety of construction materials are also available.

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High Performance in ‘Real World’ Applications

McCrometer V-Cone is an innovative flowmeter that takes differential pressure flow measurement to another level. Designed for mid to harsh operating environments, and a wide variety of fluids, this advanced flowmeter consistently outperforms traditional DP devices and other flow technologies. The V-Cone offers better accuracy and repeatability, wider rangeability, installation flexibility and reduced maintenance. Its performance is so outstanding, some users say it deserves a technology name all its own.

Accuracy You Can Count On

The key benefit to the V-Cone’s unique design is its ability to provide repeatable accuracy of up to 0.3% of range under even the most difficult flow conditions, and over a wide range of Reynolds numbers. Whether measuring swirling fluids or low pressure flows, the V-Cone delivers the accuracy and reliability other devices only achieve under laboratory conditions.

Maximum Installation Flexibility

The V-Cone’s ability to condition the flow prior to measurement results in another

Conditioner Acts As Own Flow

The V-Cone forms very short vortices at all flow passes the cone. These short vortices create a low amplitude, high frequency signal with little "signal noise." Readings are always precise and reliable, including low pressure flow situations.

Central Location of Flow Conditioning

The contoured shape and location of the suspended cone in the V-Cone Flowmeter reshapes the velocity profile. As the flow hits the cone, it is redirected away from the beta edge. Instead, a boundary layer forms along the cone, directing fluid away from the beta edge. Because the beta edge remains unchanged, the calibration of the meter is accurate for a much longer time, possibly indefinitely. The V-Cone assures long-term stability.

Operating Costs

The V-Cone Flowmeter offers exceptional versatility. It can be sized for flow diameters of 1/2” to over 120”. An extensive variety of construction materials are also available.

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High Performance

V-Cone - A Superior DP Technology

Designed for Difficult-to-Measure Applications

The V-Cone’s enhanced performance is due to the shape and position of the cone in relation to the measurement ports. This allows the V-Cone to act as its own flow conditioner by disrupting the measurement results in another significant benefit: installation flexibility. Because the V-Cone can accurately measure disturbed flow, it doesn’t require the upstream or downstream straight pipe runs of many other flowmeters. This key feature means the V-Cone can be installed virtually anywhere in a piping system or easily retrofit into an existing piping layout. The result can be significant cost savings. It also means the V-Cone can fit where other flowmeters can’t due to limited space or weight requirements.

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Ideal For Tough Applications

Real World Measurement Applications

- oil & gas production and delivery
- petroleum refining
- municipal water & wastewater
- chemical/pharmaceutical processing
- power/co-generation
- mining
- pulp & paper
- industrial manufacturing
- food & beverage

**Standard Accuracy**: From ± 0.5% of actual flow (certified fluid and Reynolds number applications require special calibrations to achieve this level). Repeatability: ± 0.1% or better. **Flow Ranges**: 1:1 and greater. **Standard Beta Ratio**: 0.45 through 0.80; special betas available. **Head Loss**: Varies with flow rate and DP. **Installation Piping Requirements**: Typically 1-3 diameters upstream and 0.5 diameters downstream of the cone are required depending on fittings or valves in the adjacent pipeline. **Materials of Construction Include**: Duplex 2205, 304, or 316 stainless steel, Hastelloy, C-276, 314, SWG carbon steel. Special materials on request. **Line Sizes**: 0.5” to 120” or larger. **End Fittings**: Flanged, threaded, hub or weld-end standard. Others on request. **Configurations**: Precision flow tube and wafer types.
- Calibrated for customer application. 
- ASME B31.3 construction available.

**Approvals for the V-Cone**
- Canadian custody transfer approved.
- Meters in compliance with PED 97/23/EC are available upon request.

**For The Real World.**
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Advanced DP Technology: Principles of Operation

The McCrometer V-Cone Flowmeter technology accurately measures flow over a wide range of Reynolds numbers, under all kinds of conditions and for a variety of fluids. It operates on the same physical principle as other differential pressure-type flowmeters, using the theory of conservation of energy in fluid flow through a pipe. The V-Cone’s remarkable performance characteristics, however, are the result of its unique design. It features a centrally-located cone inside the tube. The cone interacts with the fluid flow, reshaping the fluid flow profile and creating a region of lower pressure immediately downstream of itself. The pressure difference, exhibited between the static line pressure and the low pressure created downstream of the cone, can be measured via two pressure sensing taps. One tap is placed slightly upstream of the cone, the other is located in the downstream face of the cone itself. The pressure difference is then incorporated into a derivation of the Bernoulli equation to determine the fluid flow rate.

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Advanced Differential Pressure Flowmeter Technology

For The Real World.

www.mccrometer.com
1225 West Stetson Avenue, Hemet, California 92545 USA
Phone 800-220-2279 | 951-652-6811 | Fax 951-652-3078

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U.S.; Other U.S. and Foreign patents pending