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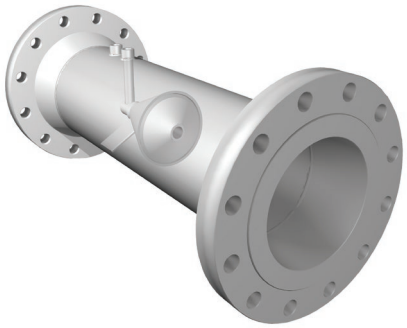


# Robust Flow Measurement Solutions for Wet Gas Applications

## The V-Cone® flow meter is a proven, low-maintenance technology taking differential pressure flow measurement for wet gas to a new level

### ROBUST

The V-Cone flow meter assures long-term performance. It has no moving parts to replace and maintain. In addition, damage tests indicate that the V-Cone can withstand up to 60% damages with only a 0.005% shift in the Cd value.

### PROVEN

McCrometer invented and patented the V-Cone in 1985. Designed for mild to harsh operating environments, the V-Cone consistently outperforms other flow technologies. Additionally, the V-Cone boats a proven lifespan of 25+ years.

### FLEXIBLE

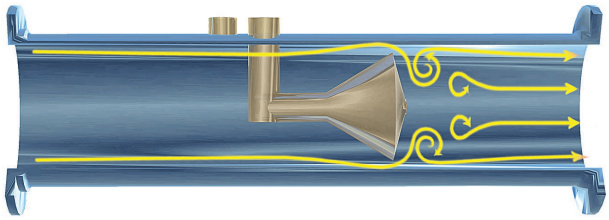
Because the V-Cone flow meter can accurately measure disturbed flow, it doesn't require the upstream or downstream straight pipe runs of other flow meters. This means the V-Cone flow meter can be installed virtually anywhere.

### Wet Gas Applications

- ✓ Wellhead flows
- ✓ Production manifold outlet
- ✓ Separator gas outflow
- ✓ Onshore upstream
- ✓ Subsea
- ✓ Wet steam
- ✓ LVF change detection (optional)

VCONE®

*As the flow approaches the cone, the flow profile "flattens" toward the shape of a well developed profile – even in extreme wet gas conditions.*



*The cone forms very short vortices as the flow passes the cone. These short vortices create a low amplitude, high frequency signal for excellent signal stability.*

## Ideal for Wet Gas

Due to proprietary flow equations, the V-Cone flow meter's ability to measure wet gas is unique in the industry. In side-by-side tests with other dP technologies, the V-Cone flow meter provided the best measurement of challenging wet gas flow regimes.

## Low Installed Cost

Because it does not require long straight pipe runs or flow conditioning devices, the V-Cone flow meter can fit into tight spaces. When retrofitting existing applications, the V-Cone flow meter typically fits right in place without having to re-engineer the piping layout. This installation flexibility saves cost, space and minimizes weight penalty problems without compromising the accuracy of the measurements. Future changes to upstream or downstream piping configurations will not affect the performance of the V-Cone flow meter.

## Superior Performance

The V-Cone flow meter delivers an accuracy to ±2-4% of rate (depending on Lockhart-Martinelli <0.3 and Froude number <5.0 with correction). It also handles turndowns of 10:1 and greater, without loss of accuracy. In addition, the V-Cone flow meter for wet gas has an unprecedented long life of twenty-five years or more.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## Specifications for Wet Gas

| | |
|---|---|
| Standard Accuracy for Wet Gas: | From ± 2 - 4% (accuracy dependent on Lockhart-Martinelli <0.3 and Froude number <5.0) |
| Operating Range: | 90 - 100% GVF |
| Design Pressure: | Up to 15,000 psi |
| Repeatability: | ±0.1% or better |
| Flow Ranges: | 10:1 and greater |
| Standard Beta Ratios: | 0.55 and 0.75 with correction (0.45 - 0.85 without correction) |
| Head Loss: | Varies with beta ratio and DP |
| Installation Piping Requirements: | Typically 0 - 3 diameters upstream and 0 - 1 diameters downstream of the cone are required, depending on fittings or valves in the adjacent pipeline |
| Materials of Construction Include: | Duplex, 304, or 316 stainless steel, Hastelloy C-276, 6MO, carbon steels. Other materials on request |
| Meter Line Size: | 2" to 12" with correction (½" to 120" without correction) |
| End Fittings: | ANSI, API compact flange, hub connectors. Others on request |
| Configurations: | Precision flow tube and wafer-type<br>• Calibrated for customer application<br>• ASME B31.3 construction standard |
| Approvals for the V-Cone Flow Meter: | • Canadian custody transfer approved<br>• Meters in compliance with PED2014/68/EU are available upon request<br>• ISO 9001:2008 certified quality management system |
| Performance Verification Testing: | ISO 17025 accreditation<br>Tested at an API Registered MPMS Test Facility according to the requirements of API MPMS Chapter 22.2 |