



ERRE DI

VR-CONO



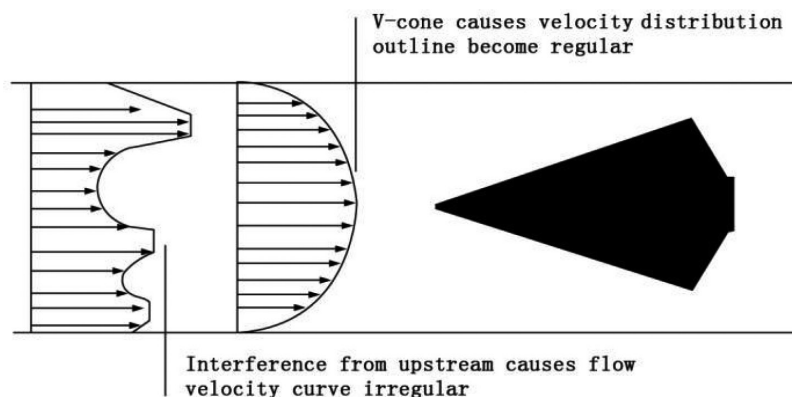
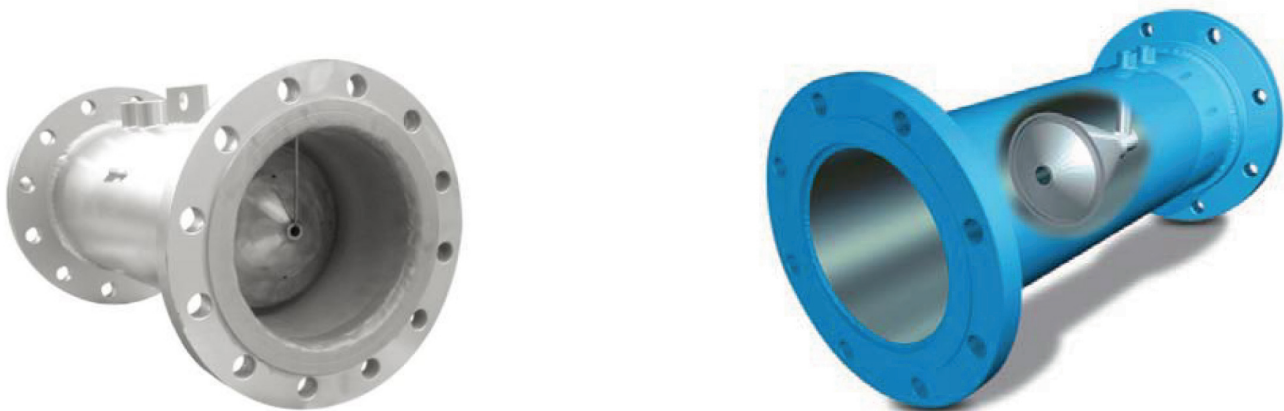
VR-CONO

HIGH PERFORMANCE

- VR Cone is an innovative flow meter that takes differential pressure- type flow measurement to another level.
- VR Cone solves the many limitations of traditional differential pressure devices and the most of the flow technologies.
- VR Cone is designed for the toughest operating environments and for the widest variety of fluids.
- VR Cone operates on the same physical principle as other differential pressure-type flow meters, using the theorem of conservation of energy in fluid flow through a pipe.
- VR Cone offers installation flexibility and reduced maintenance and acts as own flow conditioner fully conditioning and mixing the flow prior to measurement. The result is a low amplitude, high frequency signal with little "signal bounce". Readings are always accurate and reliable, including in low pressure flow situations.

ACCURACY

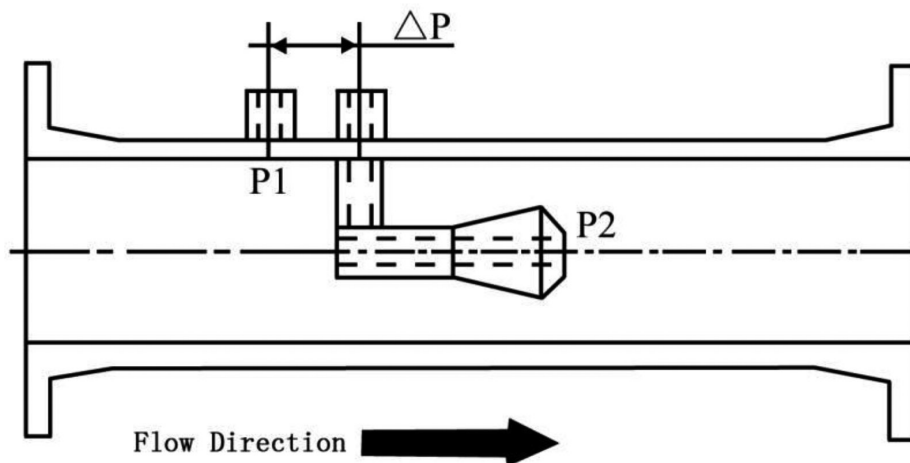
- VR Cone provides repeatable accuracy better than 1% of rate over a wide range of Reynolds numbers, under all kinds of conditions and for a variety of fluids.
- VR Cone is suitable for liquids, steam and gas also containing water and solids. It has a unique advantage in measurement of coke oven gas, blast furnace gas, natural gas, liquefied petroleum gas and steam.



VR-Cono

WORKING PRINCIPLE

The VR Cone flowmeter operates on the physical principle of differential pressure, referred to the theorem of conservation of energy in fluid flow through a pipe, incorporated into a derivation of the Bernoulli equation to determine the fluid flow rate.



$$\beta = \sqrt{1 - \frac{d^2}{D^2}}$$

$$Q = KE \sqrt{\frac{\Delta P}{\rho}}$$

$$\Delta P = P1 - P2$$

β – Ratio of Diameters

D – Inner Diameter of Pipe d - Outer Diameter of Cone Q – Flow Rate m^3/h

k – Efflux Coefficient, no dimension, depending on each flow meter

E – Gas Expansion Coefficient, no dimension, for liquids $E = 1$

ΔP – Differential Pressure Pa

ρ – Density kg/m^3

PERFORMANCE & CHARACTERISTICS

The VR Cone's performance characteristics are the result of its unique design. The cone interacts with the fluid flow, reshaping the fluid's velocity 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 VR 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 can then be 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, assuring highly accurate, reliable flow measurement regardless of the condition of the flow upstream of the meter.

Generating more stable differential pressure signal to make small flow measurement more accurate

Differential pressure of V-cone makes fluid gradually contract and flow velocity stably change through the middle cone, thus weakening the amplitude of pressure fluctuation in flowfield. The differential pressure signal generated is more stable. This is helpful for small flow measurement.

• Wider Measuring Range

The unique structure of VR cone flowmeter makes differential pressure with enough resolution generate even in low flow, making lower range of differential pressure lower than traditional differential pressure meters and the span expand to the lower range, up to 10:1 and more.

• High Repeatability & Accuracy

Repeatability better than $\pm 0.2\%$; Measuring accuracy better than 1%

• Wear-resistant, self-cleaning, long-term good stability and long service life

VR cone flowmeter will form boundary layer on cone surface when fluid flows. When fluid leaves the cone throttling end, because of boundary layer effect, dredges fluid leave to reduce the possibility of wear. At the same time its self-cleaning characteristics and the long-term stable throttling size make it stable for long term.

• Short Straight Tube Section Requirements

Generally upstream 0-3 D, downstream 0-1 D. In case of valves being installed at upstream of VR cone flowmeter, the distance before flowmeter and valve should be at least 3 D.

For orifice plate and other differential pressure type meters, it is very difficult to make sure enough straight tube section length, thus bringing additional measuring error. The cone structure of cone flowmeter works as a flow field rectifier to ensure the accuracy of measurement.

• Low Pressure Loss

Because the outlet of flowmeter body is not sharp edge, the pressure change of fluid is gentle, thus the pressure loss brought by spiral produced by friction will be smaller.

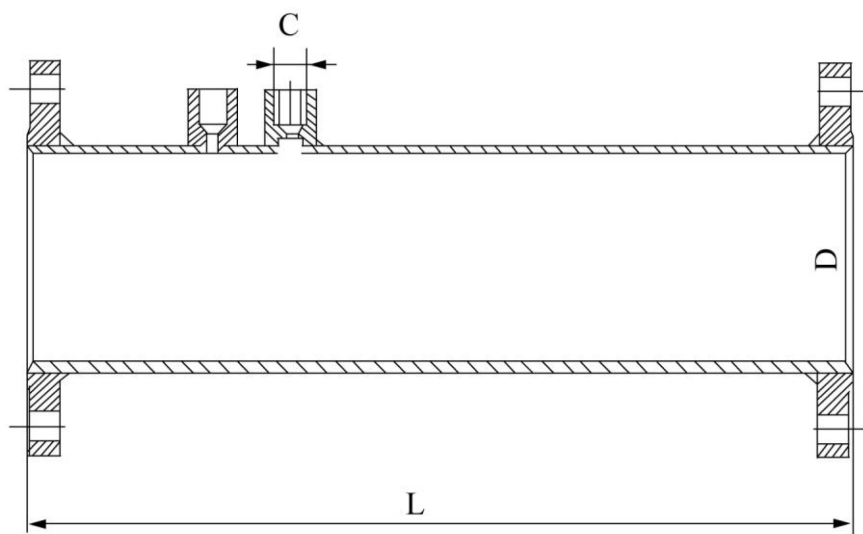
• Instrumentation supplied:

- Differential Pressure transmitter
- Flow Computer for calculating the compensated flowrate, in massflow and energy



VR-Cono

Nominal Diameter	L (mm)	C
DN25	150	M12 × 1.25
DN32	165	M12 × 1.25
DN40	200	M12 × 1.25
DN50	250	M20 × 1.5
DN65	275	M20 × 1.5
DN80	300	M20 × 1.5
DN100	350	M20 × 1.5
DN125	400	M20 × 1.5
DN150	450	M20 × 1.5
DN175	500	M20 × 1.5
DN200	550	M20 × 1.5
DN225	600	M20 × 1.5
DN250	650	M20 × 1.5
DN300	700	M20 × 1.5





ERRE.DI. s.r.l.

Offices and production

Via dei Lavoratori, 15 - 20092 Cinisello Balsamo (MI) - Italy

Tel. (+39) 02 66040229 Fax (+39) 02 6128041

www.erredisrl.it - strumentazione@erredisrl.it

