



Armstrong®

VERIS ACCELABAR®

SUPERIOR FLOW MEASUREMENT ACCURACY





VERIS Accelabar® – A Superior Idea in Flow Measurement

The Unique VERIS Accelabar® Flow Meter

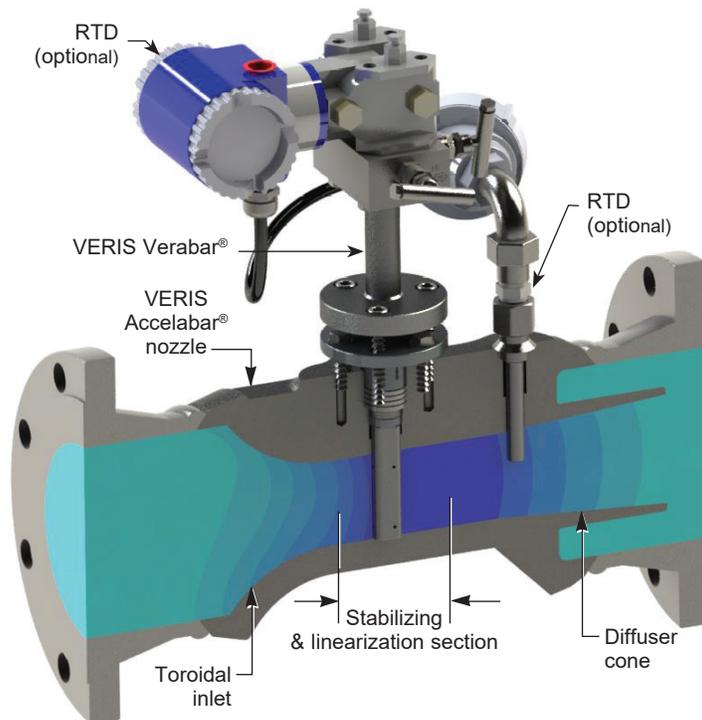
The VERIS Accelabar® is a unique flow meter that combines two differential pressure technologies to produce performance never before attainable in a single flow meter.

The VERIS Accelabar® is capable of measuring gases, liquids, and steam at previously unattainable flow rate turndowns—**with no straight run requirements.**

No Straight Run Required

The VERIS Accelabar® can be used in extremely limited straight run piping configurations. All necessary straight run is integral to the meter. The stabilization and linearization of the velocity profile within the throat of the nozzle eliminates the need for any upstream or downstream pipe runs.

US Patent No. 6,868,741 B2 and various foreign patents pending.



How the VERIS Accelabar® Works

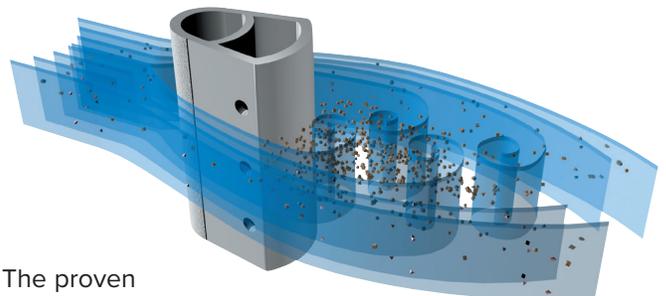
The VERIS Accelabar® combines a unique toroidal nozzle design with the VERIS Verabar® averaging pitot tube.

The nozzle’s patented “settling distance” design accelerates, linearizes, and stabilizes the fluid’s velocity profile. The VERIS Verabar® located within the nozzle then accurately measures that velocity profile.

The nozzle also significantly increases the differential pressure output, thus increasing the operating range (turndown) of the VERIS Accelabar®.

The VERIS Accelabar® has a linear flow coefficient with an accuracy of up to $\pm 0.50\%$.

VERIS Verabar® Provides the Accuracy



The proven technology of the VERIS Verabar® makes the VERIS Accelabar® work. It accurately measures the flow rate within the nozzle. Its unique bullet shape, constant flow coefficient, solid one-piece construction, non-clog design and signal stability make it the only design capable of producing the overall performance.

VERIS Accelabar® – Test Data

Verified Accuracy and Flow Coefficients

Empirical test data from an independent laboratory verified the VERIS Accelabar’s flow coefficient (K) as constant and independent of Reynolds Number. The flow coefficient remained within a $\pm 0.5\%$ error band regardless of upstream flow disturbances, thus validating the assertion: **zero straight run required**.

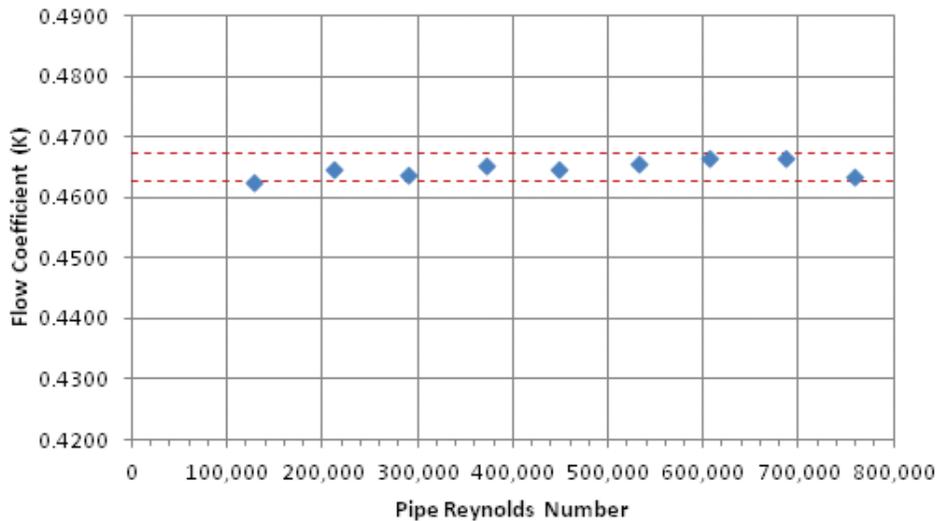
Results

Comparing the two tests shown below reveals that K values remain within $\pm 0.5\%$ of each other and within $\pm 0.5\%$ of the predicted value. This holds true regardless of upstream piping configurations that skew and distort the fluid’s flow profile.

Baseline Test at CEESI (NIST Traceable Flow Lab)

2" SCH 80 pipe Date 11-9-2009

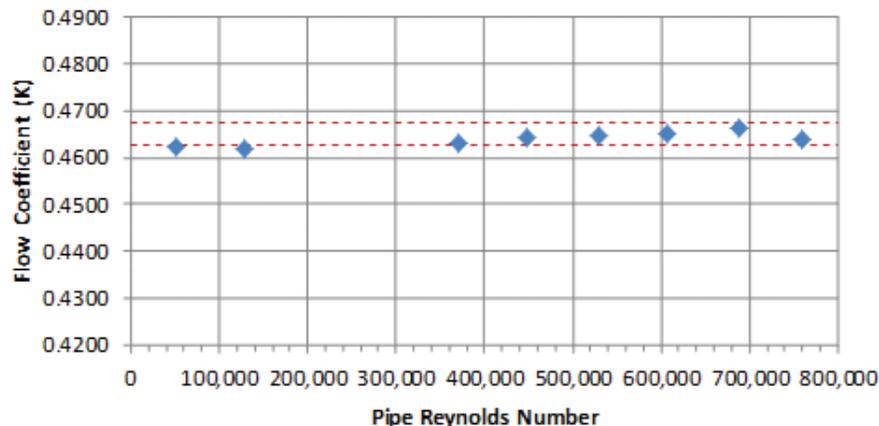
K vs. Reynolds



No Straight Run—Two Elbows Out of Plane—Test

2" SCH 80 pipe Date 11-9-2009

K vs. Reynolds





Armstrong® VERIS Accelabar® – Models and Specifications

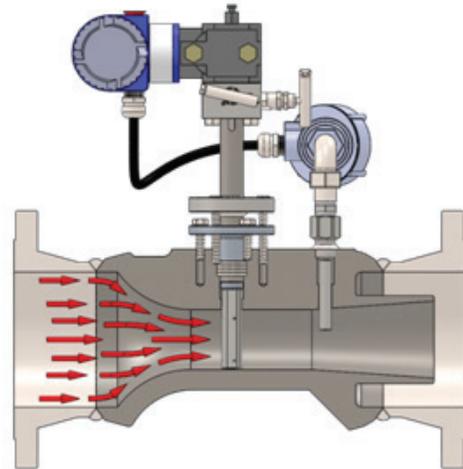
Ready to Install

The VERIS Accelabar® can be furnished as a ready to install flow meter system complete with the primary element, configured transmitter, RTD, and other secondary instrumentation such as a flow computer or data logger.

An optional RTD can be supplied in a thermowell for dynamic compensation of mass flow rates.

Engineering Specifications

- Liquids, gases, and steam
- Accuracy up to $\pm 0.5\%$ of rate over entire recommended flow range
- Repeatability: $\pm 0.5\%$ over entire recommended flow range
- Verified flow coefficients
- Capable of extended turndowns in flowrate
- No straight piping run requirements
- Mass or volumetric flow
- 316SS meter body and sensing element
- 1" – 12" in-line body sizes
- Up to ANSI600 standard & ANSI2500 upon request



Special Application Design Capabilities

Beyond standard model designs, the VERIS Accelabar® is available in an array of exotic materials, connections, and dimensional configurations.

No matter how tough the application, special engineering and design capabilities are available to provide customers the best flow solution possible.

Contact the factory directly for more information regarding special and custom designs.

VERIS Accelabar® Face to Face Dimensions

Meter Size	Face to Face "L"							
	Class 150#	Class 300#	Class 600#	PN10	PN16	PN40	PN63	PN100
1" (DN25)	7.50" (190.5mm)	8.25" (209.6mm)	8.75" (222.3mm)	N/A	N/A	10.15" (257.8mm)	N/A	11.57" (293.9mm)
2" (DN50)	8.75" (222.3mm)	9.38" (238.2mm)	10.13" (257.1mm)	11.54" (293.2mm)	11.54" (293.2mm)	11.78" (299.2mm)	12.88" (327.2mm)	13.35" (339.2mm)
3" (DN80)	13.78" (350.0mm)	14.53" (369.0mm)	15.28" (388.1mm)	12.31" (312.8mm)	12.31" (312.8mm)	12.94" (328.8mm)	14.04" (356.8mm)	14.52" (368.8mm)
4" (DN100)	15.15" (384.8mm)	15.90" (403.9mm)	17.65" (448.3mm)	13.34" (338.9mm)	13.34" (338.9mm)	14.36" (364.9mm)	15.39" (390.9mm)	16.34" (414.9mm)
6" (DN150)	19.15" (486.4mm)	19.90" (505.5mm)	21.90" (556.3mm)	16.58" (421.1mm)	16.58" (421.1mm)	18.15" (461.1mm)	19.73" (501.1mm)	21.30" (541.1mm)
8" (DN200)	21.40" (543.6mm)	22.15" (562.6mm)	24.40" (619.7mm)	18.38" (466.9mm)	18.38" (466.9mm)	20.42" (518.9mm)	22.16" (562.9mm)	23.74" (602.9mm)
10" (DN250)	23.15" (588.0mm)	24.40" (619.8mm)	27.65" (702.3mm)	20.76" (527.3mm)	20.76" (527.3mm)	23.51" (597.3mm)	25.09" (637.3mm)	27.61" (701.3mm)
12" (DN300)	26.22" (665.9mm)	27.47" (697.7mm)	29.97" (761.2mm)	23.41" (594.6mm)	23.41" (594.6mm)	26.32" (668.6mm)	28.29" (718.6mm)	30.65" (778.6mm)

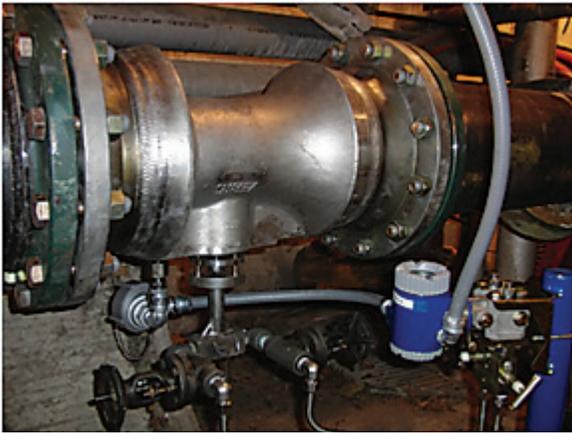
*Face to face dimensions nominal. Custom lengths available.

VERIS Accelabar® – Actual Application Performance

Application 1:

The VERIS Accelabar® is used to sub-meter distributed steam in a district energy grid. The VERIS Accelabar's ability to measure reliably at low flow conditions proves advantageous against other meter technologies.

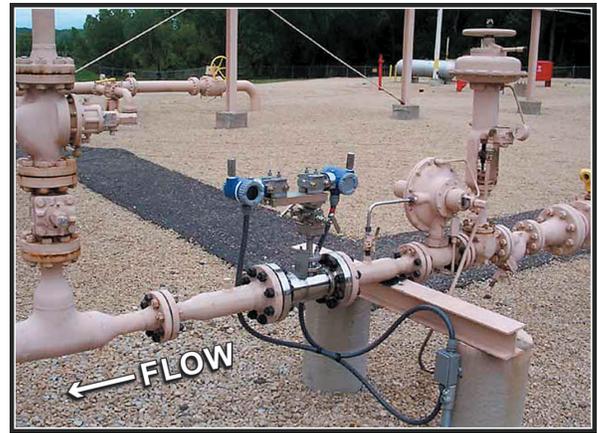
Application:	4" Sch STD Saturated Steam
Flowing Pressure/Temp:	75 PSIG/320°F
Max/Min Flow Rate:	3900 lbm/hr / 265 lbm/hr
Flow Turndown:	15:1



Application 2:

The VERIS Accelabar® is used to meter gas flow to heaters that vaporize LNG to gaseous natural gas for use during peak periods in the winter season. The VERIS Accelabar® was the only solution able to meet installation, turndown, and reliability requirements.

Application:	3" Sch 40 Natural Gas
Flowing Pressure/Temp:	80 PSIG/70°F
Max/Min Flow Rate:	60,000 SCFH / 1,000 SCFH
Flow Turndown:	60:1

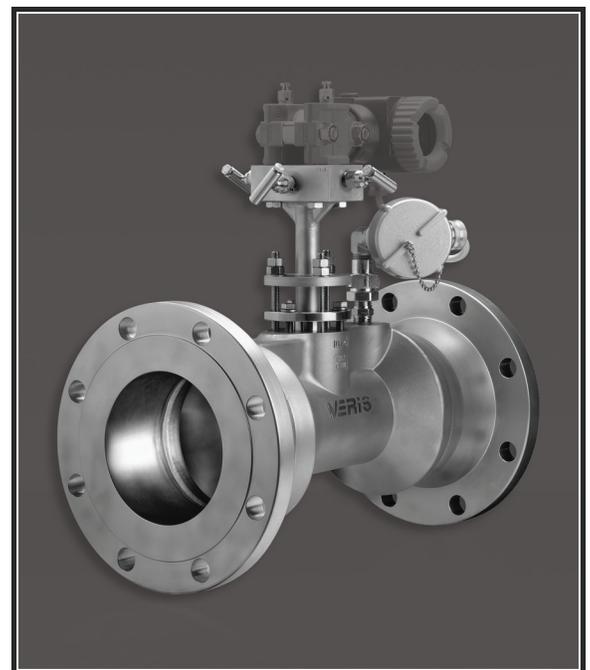


The VERIS Accelabar's Advantage vs. Other Flow Meters

The VERIS Accelabar® is able to overcome the limitations of other flow meters in applications that:

- Do not have sufficient fluid velocity to produce a readable signal or generate adequate turndown
- Require $\pm 0.5\%$ accuracy over a large range of flow rates
- Have limited or no straight piping runs before the meter's installation point

Typical performance characteristics of the VERIS Accelabar® exceed those of traditional differential pressure, vortex, and other flow meter technologies.



VERIS Accelabar® – Ordering Information

Fill in the form below, complete sections 1 through 7 and email to: veris-sales@armstronginternational.com

6315 Monarch Park Place
Niwot, CO 80503 USA

Phone: 303-652-8550

Fax: 303-652-8552

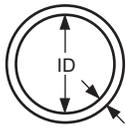
E-Mail: veris-sales@armstronginternational.com

Website: armstronginternational.com/veris

**ISO 9001
Certified**

Date: _____ Tag#: _____ E-mail: _____
 From: _____ Phone: _____ Fax: _____
 Company: _____ Address: _____ City, State, Zip: _____

1. Enter Pipe Dimensions



Pipe Size _____ Sch _____
 Pipe ID _____ Wall _____ Pipe Mat'l _____

Wall

2. Pipe Orientation (Check one box)



(H) Horizontal



(V) Vertical

3. Enter Flow Conditions

Enter Flow Conditions

Fluid Name:		Maximum	Normal	Minimum	Units	Special Instructions
Flow Rate						
All Fluids	Pressure @ Flow					
	Temperature @ Flow					
Gas	Specific Gravity, or					
	Molecular Weight					
Liquid	Specific Gravity					
Steam	VeraCalc Program can calculate Density from Temperature and Pressure					

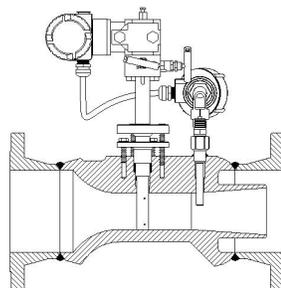
4. Select Model VERIS Accelabar® 316SS (Check one box in each category)

AFS Flanged (ANSI):

- 150# 300#
 600# ABS Bevel for Weld
 ATS MNPT Threaded Ends (1" and 2" meter only)

Specify VERIS Accelabar® Meter Size:

- 1" (DN25) 6" (DN150)
 2" (DN50) 8" (DN200)
 3" (DN75) 10" (DN250)
 4" (DN100) 12" (DN300)



5. Select Instrument Head (Check one box)

Instrument Head Connections (Select Remote or Direct Mount Transmitter — Sold Separately)				
Direct Mount Transmitter (Flanged 450°F/232°C Max.)		Remote Mount Transmitter (1/2" NPT)		
Manifold	Transmount	Valve	Regular	Parallel
Integral		Integral		
<input type="checkbox"/> M	<input type="checkbox"/> F	<input type="checkbox"/> T	<input type="checkbox"/> R	<input type="checkbox"/> P

6. Select Instrument Valves or Manifold, RTD & Cable (Optional)

Manifolds (Optional)				Instrument Valves (Optional)	
Direct Mount				Remote Mount	
3-Valve		5-Valve		Needle	Gate
Soft Seat	Hard Seat	Soft Seat	Hard Seat	1/2" NPT	1/2" NPT
<input type="checkbox"/> F3SC (CS) <input type="checkbox"/> F3SS (SS)	<input type="checkbox"/> F3HC (CS) <input type="checkbox"/> F3HS (SS)	<input type="checkbox"/> F5SC (CS) <input type="checkbox"/> F5SS (SS)	<input type="checkbox"/> F5HC (CS) <input type="checkbox"/> F5HS (SS)	<input type="checkbox"/> C2NC (CS) <input type="checkbox"/> C2NS (SS)	<input type="checkbox"/> C2GC (CS) <input type="checkbox"/> C2GS (SS)

Code	RTD in Thermowell
<input type="checkbox"/> H1	Standard Temperature, 500°F (260°C) Max., Explosion Resistant
<input type="checkbox"/> HT	High Temperature, 900°F (482°C) Max., Moisture and Dust Resistant
Code	Connection Cable to Transmitter (Direct Mount Only)
<input type="checkbox"/> XP	Explosion Resistant
<input type="checkbox"/> N4	Moisture and Dust Resistant

7. Transmitter

Supplied By
<input type="checkbox"/> VERIS
<input type="checkbox"/> Others





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