

## ASME Fabricated Type Venturi Meter (Pressure Vessel)

### HVT-CV ASME Fabricated Venturi-Pressure Vessel

#### General Description:

Certain users continue to specify and acquire Venturi meters which are manufactured in accordance with the applicable ASME and/or Fluid Meters, 6<sup>th</sup> Edition, codes and practices. PFS, Inc. recommends the HVT product line due to the superiority of metering performance, correspondingly shorter laying lengths and cost benefits associated with this novel design. However, PFS, Inc. possesses the skill, knowledge, experience and equipment to manufacture high quality ASME Venturi meters in full conformance to applicable codes. Notwithstanding, Primary Flow Signal, Inc. attributes no metering performance guaranty and refers users to the ASME codes in this regard, exclusively. As with any other equipment manufactured by PFS, Inc., workmanship and material quality is fully warranted.

#### Applications:

The PFS-CV is designed to measure full pipe, clean gasses or liquids over various temperature and/or pressure ranges. Typical applications include potable water, high pressure steam, combustion air, compressor surge control, oxygen & nitrogen measurement for air separation plants, petrochemical and chemical plants process measurement and control (alcohol, ethylene, chlorine, etc.)

#### Material of Construction:

Due to the fabricated design of the PFS-CV, the flow element can be constructed using any weld able and machinable materials. Typically materials can be mixed to balance economy with process considerations such as all S/S HVT-FV with Monel entrance section for particle impingement considerations in high velocity oxygen service. A list of suitable materials includes but is not limited to:

Carbon Steel	Chrome Moly	Inconel
316 Stainless Steel	Aluminum	Zirconium
304 Stainless Steel	Hastelloy B & C	Titanium
Duplex S/S	Monel	Tantalum

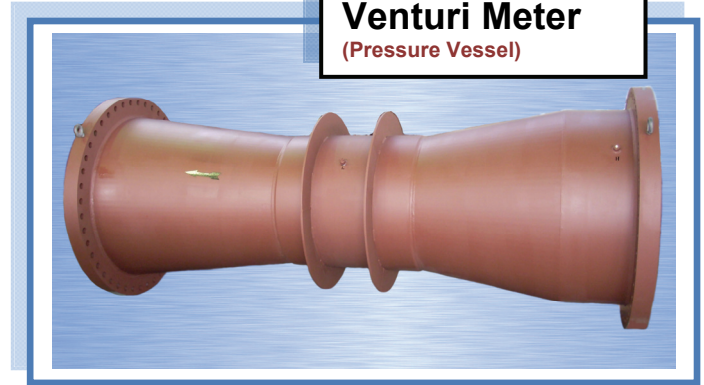
#### Design and Manufacturing Standards:

- All materials are mill certified and of first quality.
- All applicable codes and standards are considered such as section 8 of the Boiler and Pressure Vessel Code as well as ASME B31.1 and 31.3 ASME fluid meters, MFC-3M-1985, ISO 5167, BS-7045, compliant.
- Designed for use with Raised Face, Flat Face, Weld End, Ring Joint or Van Stone Flanges of any flange rating of either U.S. or foreign standards.

*Typically, the line size range covered by contemporary ASME code does not contemplate diameters exceeding 48.0 inches, even though numerous applications worldwide apply the design freely to such larger line size metering applications. In all instances, PFS, Inc. will note exceptions where the code is exceeded but will offer designs and equipment subject to customer written approval.*

#### PFS Classical Venturi Model Numbers:

<b>PFS-CVF</b>	Classical Venturi, Flanged	<b>PFS-CVFR</b>	Classical Venturi, Flanged, Run
<b>PFS-CVW</b>	Classical Venturi, Butt Weld Ends	<b>PFS-CVWR</b>	Classical Venturi, Butt Weld Ends, Run



#### General Features:

- ✓ High Accuracy, Reliability
- ✓ Low Permanent Pressure Loss
- ✓ Produced in Accordance with ASME-MFC-3M-1989
- ✓ Custom Designed for specific application
- ✓ Prompt, reliable response to your technical inquiries, with custom computer generated documentation, calcs and drawings.

#### Product Specifications:

##### Accuracy:

- +/-1.00% of actual reading (per ASME)
- +/-0.25 of actual reading of better based on hydraulic calibration.

##### Operating Conditions:

- Line Fluid Capability:
  - Gas or liquid full pipe flow.
  - Clean with minimal particulate contamination.
  - HVT-SM Sealed System* accommodates contaminated flow applications.

##### Temperature Range:

- As limited only by the materials of construction and capabilities of the associated secondary device(s) used.)

##### Line Pressure Capacity:

- From full vacuum to the limits of materials.

##### Line Size Capability/End Arrangement:

- ASME MFC-3M-1989 specifies line size range between 4.0" and 48.0". PFS can produce any line sizes between 3/8" through 144", as required by application, subject to customer's written authorization. Flange ends, weld end, plain end, mechanical joint or other as required.

##### Beta Ratio Capability:

- Custom sized and designed for Beta ratio range between 0.30 through 0.75.

##### Pipe Reynolds Number $R_D$ Capability:

- ASME code defines the  $R_D$  range at which the discharge coefficient is stable to occur between 200,000 and 6,000,000.

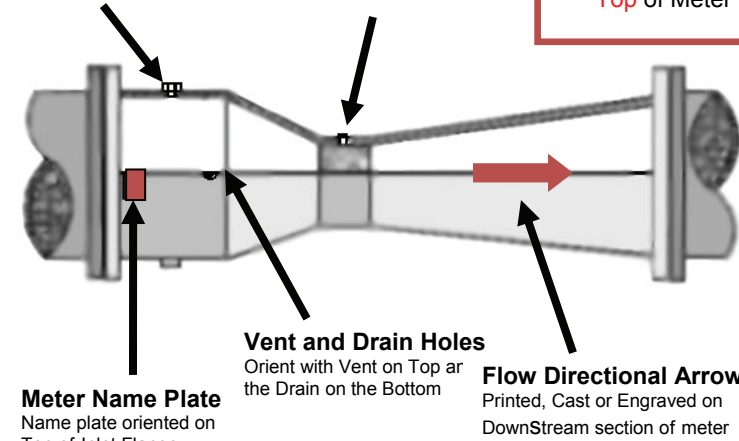
##### Permanent Pressure Loss:

- Varies from 5% to 20% of differential depending on application conditions, beta ratio.

**High Pressure Tap**  
(2)-180 degrees apart

**Low Pressure Tap**  
(2)-180 degrees apart

**Metering Section is in Plan View**  
Looking Down on **Top** of Meter



**FAILURE TO FOLLOW INSTALLATION DIRECTIONS MAY VOID WARRANTY**

### Installation of an ASME Venturi:

1. This is a high quality flow meter! Handle with care during installation.
2. If improperly installed, it must be reinstalled!
3. If damaged, it must be replaced!
4. Handle it from the outside ONLY!
5. Do not damage the inside!
6. Install meter in the pipe line so that the **FLOW DIRECTIONAL ARROW** agrees with the direction of flow!
7. Orient Pressure Taps **Horizontally!**
8. Provide necessary clearances as deemed practical for the installation, inspection and maintenance!
9. Tighten flange bolts according to typical industry flange assembly standards, adequate to prevent leakage from the connections.
10. Tolerances should be within industry standards for these installation instructions.

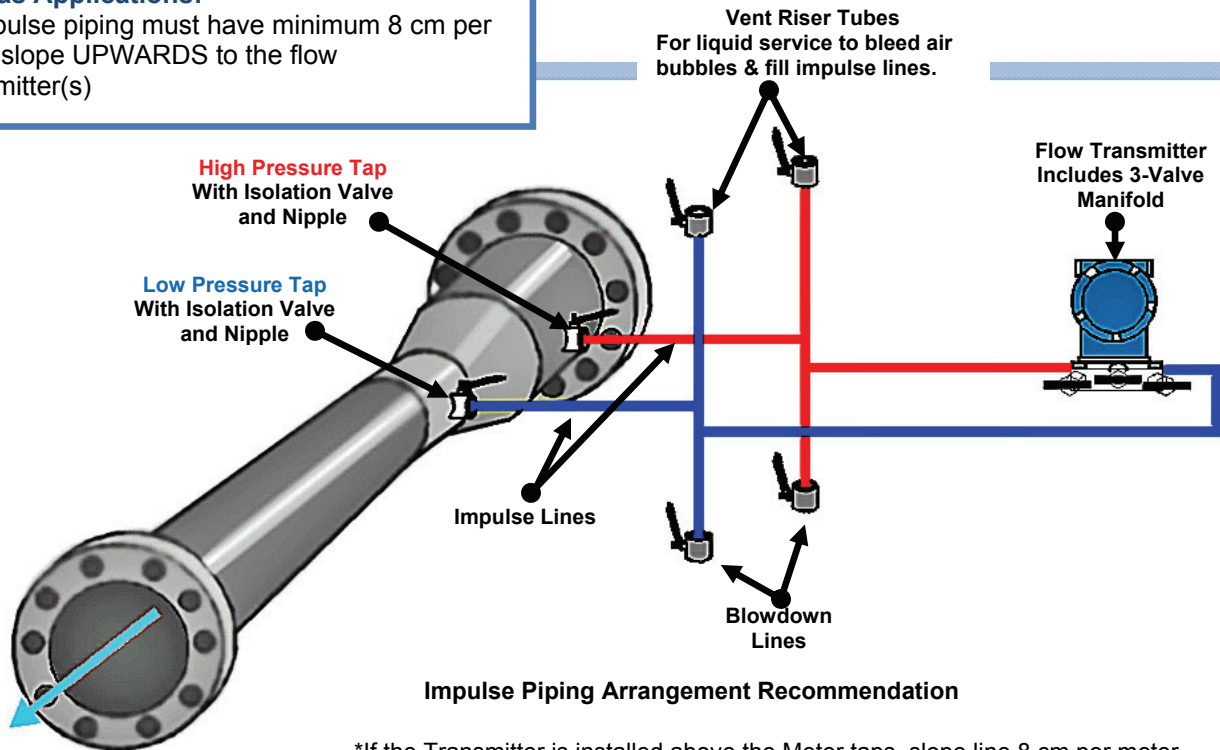
### General Note:

#### \*For Liquid Applications:

All Impulse piping must have minimum 8 cm per meter slope DOWN to the flow Transmitter(s).

#### For Gas Applications:

All Impulse piping must have minimum 8 cm per meter slope UPWARDS to the flow Transmitter(s)



\*If the Transmitter is installed above the Meter taps, slope line 8 cm per meter UPWARDS to Transmitter and install Vent Riser Tubes.