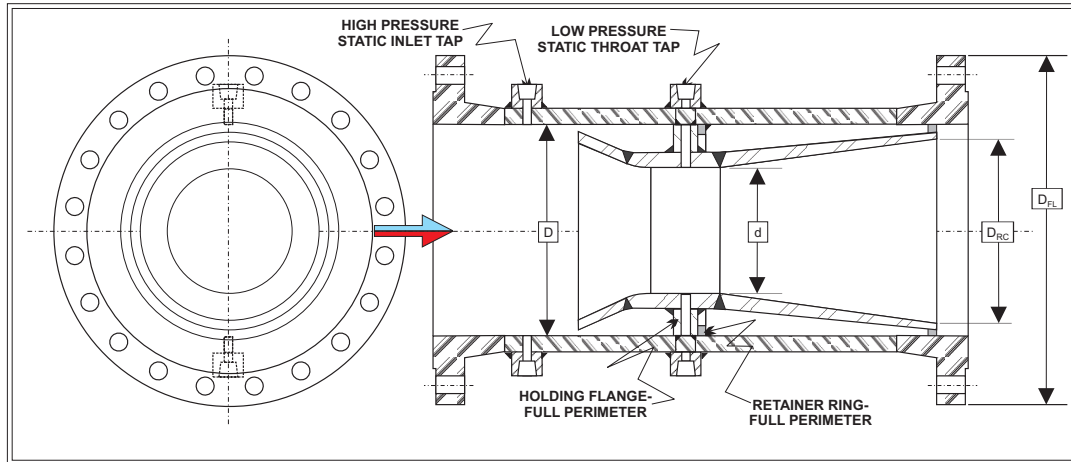


SUITABLE FOR THESE USES:	
<input checked="" type="checkbox"/>	INDUSTRIAL APPLICATIONS
<input checked="" type="checkbox"/>	MUNICIPAL APPLICATIONS

HVT-WI Halmi Fabricated Weld In-Line Venturi



- General Features:**
- ▶ High Accuracy, Reliability
 - ▶ Low Permanent Pressure Loss
 - ▶ Low Installed Cost
 - ▶ Ideal for High Combined stress applications
 - ▶ Unaffected by downstream piping
 - ▶ Custom designed for specific application
 - ▶ Bi-Directional designs are available
 - ▶ Field verifiable
 - ▶ Long Service Life (Up to 25 year warranty)
 - ▶ Total Support from Design through Installation and Beyond

GENERAL DESCRIPTION:

The HVT-WI, Halmi Fabricated Weld In-Line Venturi primary flow element is a full performance, high accuracy and reliability differential producing flow measurement device that is thoroughly substantiated for 2 sigma performance. This design combines benefits of the HVT-FV traditional fabricated pressure vessel design with the fabricated HVT-FI insert design. Apart from greater innate manufacturing economies available in many instances, the HVT-WI configuration permits flow measurement in applications where the combined stresses may render traditional pressure vessel designs untenable. Some stresses are caused by line pressure, thermal expansion differences between dissimilar materials, and materials of disparate thicknesses. Occasionally, external pipe loads can develop high stresses in the throat section due to its smaller section modulus, as compared to the adjacent piping. Accuracy, low installed cost, long service life and design flexibility are key characteristics of these primary flow elements. Special thermal expansion tap cupolas are available, as are grouted-in designs for larger line sizes are available. Please ask for details.

APPLICATIONS:

The HVT-WI, Halmi Fabricated Weld In-Line Venturi primary flow element is designed to measure full pipe, clean gasses or liquids over extreme temperature and/or pressure ranges. The HVT-WI has the advantage of minimum cost, weight, permanent pressure loss and laying length with maximum accuracy, repeatability, reliability and performance substantiation (to 2 sigma.) 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.)

MATERIALS OF CONSTRUCTION:

Due to the fabricated design of the HVT-WI, the flow element can be constructed using any weldable and machinable material(s). Typically materials can be mixed to balance economy with process considerations such as all S/S HVT-FI 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 between raised face, flat faced, ring joint or van stone flanges of any flange rating of either U. S. or foreign standards.

PRODUCT SPECIFICATIONS:

Accuracy:

- +/- 0.50% of actual reading (2 Sigma)
- +/- 0.25% of actual reading or better based on hydraulic calibration.

Range Ability:

100:1 or more depending on secondary group capabilities and arrangement.

Operating Conditions:

- Line Fluid Capability:
 - Gas or liquid full pipe flow.
 - Clean with minimal particulate contamination.
- Temperature Range:
 - Cryogenic to Superheated Steam.
 - 400°F to 1250°F (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 the process piping.

Line Size Capability:

- Unlimited line size capabilities.
- Between 3" through 144" in service.

Beta Ratio Capability:

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

Pipe Reynolds Number R_D Capability:

- Discharge coefficient is constant above 75,000 R_D .
- Discharge coefficient bias and random error between 12,000 R_D and 75,000 R_D is empirically established and highly repeatable.

Permanent Pressure Loss:

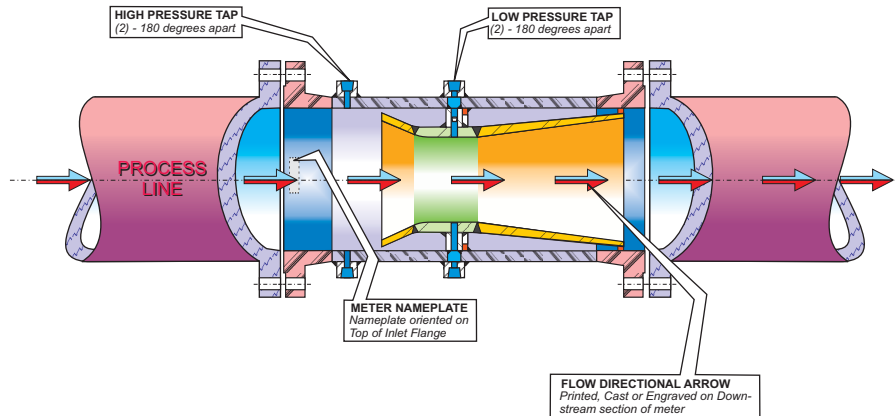
Varies from 3% of differential and up depending on application conditions, beta ratio, and exit cone truncation ratio, and can be engineered to meet your requirements

PLEASE NOTE: Use this data as general application guidance for the equipment and/or services referenced herein. Users may reasonably expect this disclosure to constitute an accurate factual representation at the time of publication, however all data and specifications contained herein are subject to change without prior notice. This is not a contractual obligation of PFS, Inc. Primary Flow Signal, Inc. is bound SOLELY by its official SUBMITTAL document when presented in connection with an actual purchase and sale transaction, which SUBMITTAL shall form the controlling representation of any product or service claimed by Primary Flow Signal, Inc.



INSTALLATION INFORMATION

Typical Installation Arrangement for HVT-WI Pressure Vessel Type Venturi



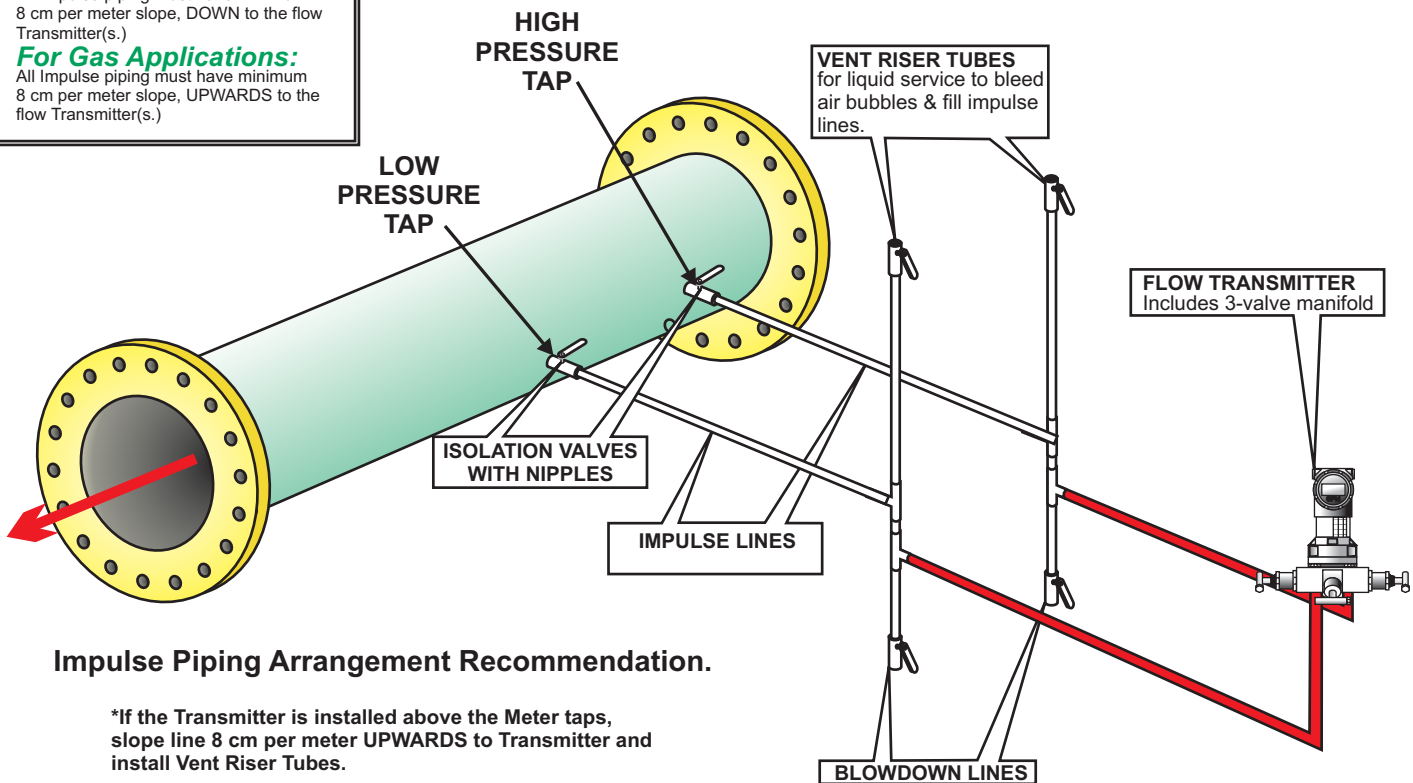
Metering Section is in
PLAN VIEW
LOOKING DOWN
ON TOP OF METER

--- FAILURE TO FOLLOW INSTALLATION DIRECTIONS MAY VOID WARRANTY! ---

The Proper Method of Installing a Halmi Venturi Meter PRESSURE VESSEL DESIGN

- Item 1:
This is a high quality flow meter! Handle with care during installation.
- Item 2:
If improperly installed, it must be reinstalled!
- Item 3:
If damaged, it must be replaced!
- Item 4:
Handle it from its outside ONLY!
- Item 5:
Do not damage its inside!
- Item 6:
Install meter in the pipe line so that the *Flow Directional Arrow* agrees with the direction of the flow!
- Item 7:
Orient Pressure Taps HORIZONTALLY!
- Item 8:
Provide necessary clearances as deemed practical for installation, inspection and maintenance!
- Item 9:
Tighten flange bolts according to typical industry flange assembly standards, adequate to prevent leakage from connection.
- Item 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.)



Impulse Piping Arrangement Recommendation.

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