

Application Guide Oil & Gas

Primary Flow Signal, Inc. and its subsidiary, Turbines, Inc., offer comprehensive and specialized flow measurement resources to meet the requirements of the oil and gas market. Whether traditional petroleum applications, non-traditional sources like shale or tar sands, our broad product range meets and exceeds the exacting requirements of our customers. Highly-skilled engineers, machinists, fabricators and assemblers, with state-of-the-art CNC lathes and machining centers, produce the finest line of flow measuring equipment on the market today.

The PFS difference:

- Products that are highly accurate and reliable over a long service life
- Industry-leading engineering expertise to customize metering to application requirements
- Fast, 24-hour shipment of field-proven, industry-standard products, such as turbine meters

For unparalleled accuracy, reliability, documented performance, longevity, plus the highest level of product engineering, manufacturing quality, and technical support, PFS is your partner for all of your oil and gas flow measurement needs.



Vertically-Integrated Manufacturing in Cranston, RI

- We engineer, manufacture, and calibrate our products in our own modern facilities in the U.S.A. using the highest quality materials and advanced equipment
- Vertically-integrated manufacturing for complete quality and cost control, meaning greater value for our rapidly growing customers throughout the world

PFS's quality management system is certified to ISO 9001, ASME S, U, R, European PED Module H; and other internationally recognized certifications, such as GOST, IBR, and CRN.



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All PFS products are proudly made in the U.S.A.

High Accuracy, High Value Metering for the Oil and Gas Industry

Primary Flow Signal, Inc. is a leader in the design, manufacture, and support of flow metering solutions field-proven and lab calibrated for unparalleled performance within the most extreme oil and gas applications.

We offer our worldwide customers unparalleled engineering expertise, on-site support service, and a broad product range that includes turbine flow meters, orifice plates, WedgeType™ flow meters, differential pressure Venturis, peripheral electronics, and monitors. R&D-driven innovation, vertically-integrated manufacturing, deep inventory, and bankability translates to customized and off-the-shelf solutions that are able to meet our customers' rugged requirements.

Our products are optimized for land and offshore petroleum applications including non-traditional sources like shale and oil sands. We specialize in extraction and custody transfer for gas, water, as well as highly-viscous media, such as tar sands.



Offshore Applications



Extraction Applications



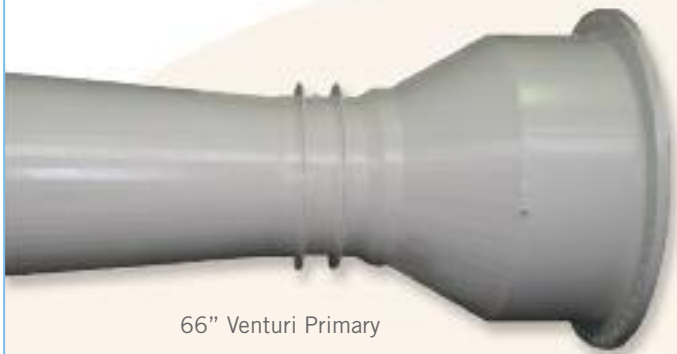
Non-Traditional Applications
(Oil Sands, Shale Gas)



Custody Transfer Applications



Unparalleled metering performance ...



66" Venturi Primary

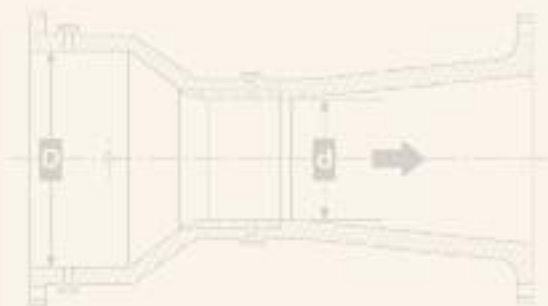
HVT-FV Pressure Vessel

The **HVT-FV Pressure Vessel, Halmi Venturi primary** is a rugged flow meter with the most thoroughly substantiated accuracy and reliability on the market: **+/- 0.25% accuracy (lab calibrated)**. The HVT-FV is field-proven to perform within the extreme temperatures, pressures, and irregular or abrasive line flows of oil and gas applications.

PFS can custom manufacture the HVT-FV in a wide variety of configurations and materials:

- Line sizes from 1" to 180"
- Bi-directional designs
- Almost any machineable material such as: 300-series stainless steel, Monel™, zirconium, Hastelloy®, aluminum, and titanium

Incorporating the HVT-SM Sealed Metering System and other PFS secondary devices allows measurement of solids-bearing (contaminated) line fluids and higher viscosity liquids through fully-integrated technology.



HVT-FI Halmi Pressure Insert Venturi

The **HVT-FI Venturi** performs under pressure, providing a long service life of accurate, reliable metering at low cost, and is well adapted to the exacting standards and harsh conditions of oil and gas applications.

- Lower-cost option for flow metering over extreme temperature and pressure ranges
- Secured by flanges between abutting pipe ends, this meter has no pressure limit beyond that of the pipe itself



- Insert design provides cost savings, while delivering accurate, reliable flow measurement over a long service life

PFS can custom manufacture the HVT-FI in a wide variety of configurations and almost any machineable materials for the most accurate metering solution **(+/- 0.25% lab calibrated, 2 Sigma)**.



HVT-FI Series

... for oil & gas applications



PFS-WM WedgeType Meter

The **PFS-WM WedgeType™ Flow Meter** excels where others fail by accurately measuring highly viscous, rough, or solids-bearing fluids and slurries, as well as gas or steam — even asphalt and tar sands.

- **+/- 0.5% to +/- 1.0% accuracy and +/- 0.25% repeatability based on laboratory calibration**
- Ability to handle low Reynolds numbers
- Multiple tap sets for stacked DP transmitters for wide flow rate range applications; can also be heat jacketed, if necessary

Coupled with PFS secondary instrumentation, the PFS-WM provides the most durable, accurate, and reliable metering solution, and is an ideal choice for tar and oil sands.



WedgeType™ Flow Meter

HP-Series High Pressure Turbine Meter

Specifically designed to withstand harsh oil-field conditions, such as highly abrasive flow and fracking, the **HP-Series High Pressure Turbine Flow Meter**, available via our subsidiary, Turbines, Inc., is ideal for accurate liquid flow metering in extreme applications.



HP-Series

- Factory tested and calibrated to **+/- 1.0% accuracy**
- Connects to WECO®, API®, or other hammer-union style, high-pressure hubs
- Working pressures up to 15,000 PSI
- Stainless steel body
- Tungsten carbide bearings and pickup coil

Matching the HP-Series turbine with one of our low-cost monitors makes for an ideal, integrated solution to meet the demands of oil-field applications on land and offshore.



For more information, visit www.primaryflowsignal.com