

# **About Us**

Flow Measures is a technology-driven company that offers complete comprehensive solutions of integrated flow measurement packages and solutions in Power, Water & Wastewater, Food & Beverages, Oil & Gas, Chemical, Pharmaceutical & Commercial/Residential building automation. Our team always takes a customer-centric approach in understanding customer needs and wins customer satisfaction by providing cost-effective, innovative, feature-rich, customized flow measurement solutions. With our expertise & specialization in Instrumentation, Mechanical Engineering & Fluid Dynamics, we are always focused on serving customers with our diverse products, solutions, superior after-sales service & maintenance support. As Lord Kelvin Said "If you cannot measure it, you cannot improve it", so, we provide a holistic solution to flow measurement challenges, when time is of the essence. Flow Measures has the advantage big enough to offer experience and innovation and small enough to provide flexible solutions and work within your budget. We're focused on serving emerging markets and providing superior after-sales service and maintenance support with a diverse portfolio of products and solutions.

## Our Mission:

Committed to innovation, engineering and development of custom precision flow measurement solutions

## Our Vision:

To help our clients in solving their unique problems with custom flow measurement solutions





device. It works on Bernoulli's principle and measures flow by detecting the differential pressure created across the throat and the upstream side. Medium entering the venturi through the upstream side is accelerated through a converging nozzle, followed by a diverging diffuser section. Venturi tube is suitable for measuring the flow velocity with minimal pressure drop as the diffuser allows the medium to regain most of its original pressure.

#### **SPECIAL FEATURES**

- Suitable for liquid, gas and steam flow measurement
- Accuracy ≤±0.5 % of actual flow rate
- Repeatability of measurement 0.1 %
- Lowest pressure loss in the family of primary flow elements
- Calibration may be performed, if required
- Venturi tube design based on ISO5167, ASME.MFC.3M and ISO TR15377:2007 industry standards
- Accuracy, repeatability and reliability of the flow element
- Very low pressure loss
- Low requirements in terms of upstream and downstream lengths
- Suitable for all types of fluids, large flow range
- Long working life
- Different types of venturi tubes: machined from a bar stock or rolled and welded from a metal sheet or casted

- Oil and Gas
- Power generation
- Water and waste water treatment and distribution
- Gas processing and transmission
- Chemical and Petrochemical Industries
- Food and Beverages

#### **Design Standards:**

ISO 5167-4, ASME MFC-3M & ISO TR 15377:2007 Industry Standards

#### Pressure rating:

Flange Class 150~2500 lbs, ISO PN 20-420.

#### Material:

Carbon steel, AISI 316, Duplex, Super Duplex, Inconel 825/625 (others on request)

#### Mounting style:

Weld ends / Flanges /Grayloc Clamp connections.

#### Pressure taps:

Weld ends Ø 21.3 mm, 26.9 mm, Thread connection 3/8", 1/2" BSP, 1/2"NPT, or flanged. (others on request)

#### Tapping:

Single pressure tapping or 2x4 tapping each arranged with an external annular ring to equalize the pressure.

#### **Outlet cone:**

 $7^{\circ} - 15^{\circ}$ 

#### Pressure loss:

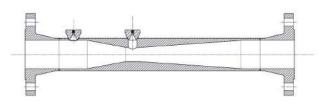
Depending on outlet cone between 10 - 15 % of the differential pressure measured

#### Limits for Re. No.:

 $2 \times 10^5 < ReD < 2 \times 10^6$  according to ASME

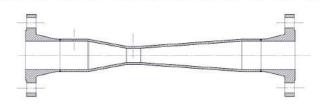
# **Ordering information**

Model / Nominal size / Pipe schedule Nominal pressure rating / Sealing face Pressure tappings / Material



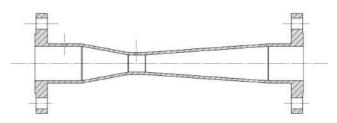
#### Venturi tube - From bar stock

Sizes: (other sizes on request).: DN 50 - 250 according to ISO 5167, 2"- 10" according to ASME **Beta** (d/D):  $0.4 \le \beta \le 0.75$ 



#### Venturi tube - From welded sheet

Sizes: (other sizes on request). DN 200 - 1,200 according to ISO 5167, 8" - 48" according to ASME **Beta** (d/D):  $0.4 \le \beta \le 0.70$ 



#### Venturi tube - From cast

Sizes: (other sizes on request). DN 100 - 800 according to ISO 5167, 4" - 32" according to ASME **Beta** (d/D):  $0.3 \le \beta \le 0.75$ 

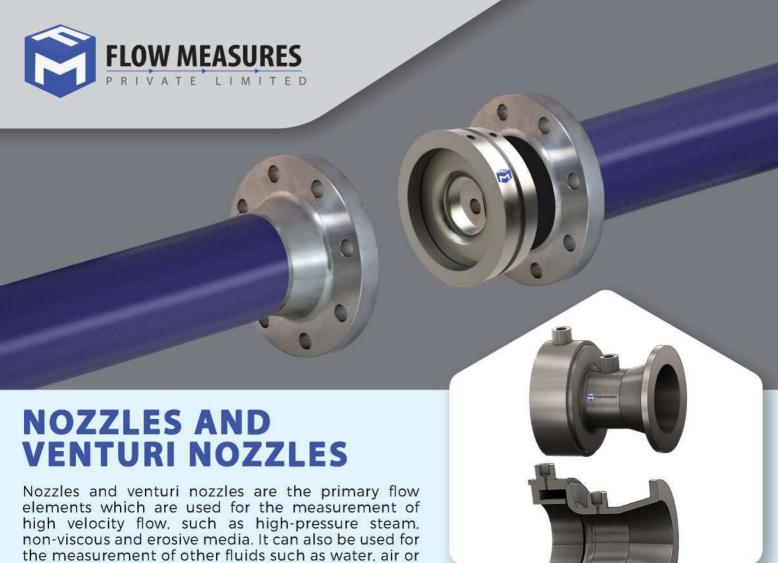


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other gases. The design of the nozzles and venturi nozzles are based on Bernoulli's equation and consists of a convergent section with a rounded profile and a cylindrical throat. Due to its rigidity the nozzle is dimensionally more stable at higher temperature and flow rates.

## **SPECIAL FEATURES**

- Suitable for liquid, gas and steam flow measurement
- Proven technology and robust design
- Calibration may be performed, if required
- Flow nozzle design based on ISO5167, ASME.MFC.3M and ISA1932 industry standards
- Accurate, repeatable and reliable
- Accurate flow metering of high velocity steam and gas.
- Optimum solution for measuring the flow of steam
- Flow nozzles are accurate devices for measuring the flow of high velocity, non-viscous fluids and particularly suitable for erosive fluids where the sharp edge of an orifice plate could quickly deteriorate
- Accuracy typically ±3% un-calibrated, ±1% calibrated
- Extended working life

#### **TYPES**

- ISA 1932 nozzle
- Long radius high beta
- Long radius low beta
- Venturi nozzle-truncated
- Venturi nozzle -non truncated

- Oil and gas industry
- Steam process and high velocity process for erosive fluids
- Power generation
- Water treatment and distribution
- Gas processing and transmission
- Chemical and petrochemical Industries
- Food and beverages
- All sorts of flow measurements in liquid, gas or steam applications of various industries

## **Design Standards:**

ISO 5167-3, ASME MFC-3M, ASME PTC-6,ASME PTC-19.5and ISA1932 Industry Standards

#### Line Size:

DN50 (1") to DN1000(40"), Larger lines sizes available on request

## **Pressure Rating:**

Ranging from ANSI 150# to 2500#

## Flow Nozzle Material:

CarbonSteel, Low Temperature Carbon Steel, Stainless Steel, Chrome Molv Steel, Duplex, Super Duplex, 6 Mo. Aluminum(Further materials are available on request

## Flange Material:

SA105 / SA182F11 / SA182F22 / SA182 F91

## **Mounting Style:**

Flanged / Butt weld /Insert type

## Types of Tappings:

Flanged / NPT / Socket Weld / Thread O'let / Socket O'let, further types are available on request

## Markings:

Marked with the line size, bore size and material of construction.

### B Ratio:

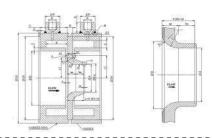
0.2 to 0.8 (Nozzle Type Dependant)

# **Design Specifications:**

#### ISA 1932:

Sizes:DN 50mm - 500mm Design standard: perISO 5167 Beta (d/D):  $0.3 \le \beta \le 0.8$ 

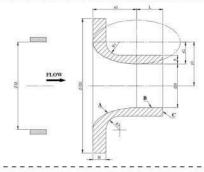
Reynolds number:  $10^4 \le \text{Re} \le 10^7$ 



## Long Radius High Beta:

Sizes: DN 50mm - 630mm Design standard: per ISO 5167 Beta (d/D):  $0.25 \le \beta \le 0.8$ 

Reynolds number:  $10^4 \le \text{Re} \le 10^7$ 

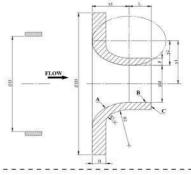


## Long Radius Low Beta:

Sizes: DN 50mm - 630mm Design standard: per ISO 5167

Beta (d/D):  $0.2 \le \beta \le 0.5$ 

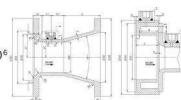
Reynolds number: 10<sup>4</sup> ≤ Re ≤ 10<sup>7</sup>



#### Venturi Nozzle-Truncated:

Sizes: DN 65mm - 500mm Design standard: per ISO 5167 Beta (d/D):  $0.316 \le \beta \le 0.775$ 

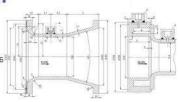
Reynolds number:  $1.5x10^5 \le Re \le 2x10^6$ 



#### **Venturi Nozzle-Non Truncated:**

Sizes: DN 65mm - 500mm Design standard: per ISO 5167 Beta (d/D):  $0.316 \le \beta \le 0.775$ 

Reynolds number:  $1.5x10^5 \le Re \le 2x10^6$ 



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orifice, through which the fluid flows. The differential Pressure generated is directly proportional to the fluid flow rate. Material of construction is guided by the process parameters including temperature, process medium etc, flowing through the pipe. It is one of the most accepted, efficient and versatile methods of measuring flow.

#### **SPECIAL FEATURES**

- Suitable for liquid, gas and steam flow measurement
- Accuracy ≤±0.1 % with calibrated spool, typically ≥ 2 to
- Calibration may be performed, if required
- Proven technology
- Easy installation and maintenance
- Orifice design based on ISO5167-2, ISO TR15377, ASME MFC-3M and AGA3 industry standards
- Accurate, repeatable and reliable
- Applicable for viscous, highly viscous liquid contains sediments and suspended solid, hydrocarbon and contaminated fluid
- Unique design ensures the proper alignment within pipe, resulting in higher accuracy
- Application with low Reynolds number
- Extended working life

### **TYPES**

- Concentric square edged
- Quarter circle
- Conical entrance
- Segmental
- Eccentric

- Oil and gas Industry
- Process measurement allocation
- Water and waste water treatment and distribution
- Chemical and petrochemical Industry
- Mining and basic material industry
- Pulp and paper industry
- Power generation
- All sorts of flow measurements in liquid, gas or steam applications of various industries

## **Design Standards:**

ISO 5167-2, ISO TR 15377, ASME MFC-3M and AGA-3 Industry Standards

#### Line size:

DN15 (½") to DN1200 (48") (Special sizes are available)

## Pressure rating:

150# to 2500#

#### Material:

Orifice Plates: 304SS/316SS/321SS, UNS S31803/UNS S32760/UNS S31254 Alloy 400/625/825/C276

Tantalum, Titanium (Others available on request)

Flange: Carbon steel & SS Standard. Specials DSS, SDSS & Monel. Others on request.

#### Plate size:

Available for line sizes from 25 mm to 1250 mm

## Plate thickness:

Standard thickness of 3mm & 10mm. Flanges (API / ASME), Hubs, Carriers and Welded directly into piping.

#### Pressure taps:

Corner pressure tap, D & D/2 pressure tap and flange pressure tap.

## Marking:

All plates are marked with the line size, bore size, material of plate, customer's Tag Number, Flange Class and Face type

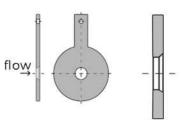
## β ratio:

0.15 to 0.80 (Dependent on design of orifice plate)

## **Design Specifications:**

## Concentric type:

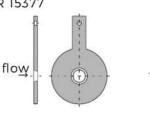
Design standard-per ISO5167-2 Size ≥ 2" (50mm) Beta (d/D):  $0.2 \le \beta \le 0.75$ 



## Quarter circle type:

Design standard-per ISO5167-2 /TR 15377 Size ≥ 2" (50mm)

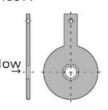
Beta (d/D):  $0.245 \le \beta \le 0.600$ 

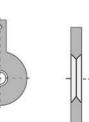


#### Conical entrance type:

Design standard-per ISO5167-2 /TR 15377

Size ≥ 2" (50mm) Beta (d/D):  $0.100 \le \beta \le 0.316$ 



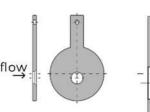


#### **Eccentric type:**

Design standard-per ISO5167-2 /TR 15377

Size ≥ 4" (100mm)

Beta (d/D):  $0.460 \le \beta \le 0.840$ 

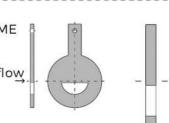


#### Segmental type:

Design standard-per ISO5167-2/ASME

Size ≥ 4" (100mm)

Beta (d/D):  $0.350 \le \beta \le 0.800$ 



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V-shaped wedge is fitted. Through this constriction, a pressure differential is generated proportional to the volume flow rate. Due to the symmetry of the wedge meter, measurement is possible in both directions. The pressure tappings are on either sides of the wedge. Wedge Meter is best suited for the measurement of challenging process fluids such as slurry, liquids with entrained gas, liquids with particles, abrasive fluids etc.

## **SPECIAL FEATURES**

- Accurate flow metering of highly viscous liquids with suspended solids
- Wedge meter design based on ISO5167-6 industry standards
- Accurate, repeatable and reliable
- Low maintenance
- Low permanent pressure loss
- Extended working life
- For very high and very low Reynolds numbers
- Bi-directional measurement possible

- Oil and Gas
- · Water and waste water treatment and distribution
- Chemical and Petrochemical Industries
- Mining and basic material industry
- Pulp and paper industry
- Cement manufacturing industry

## **Design Standards:**

ISO 5167-6 Industry Standards

#### Line Size:

DN50mm to DN800mm larger lines sizes available on request

## **Pressure Rating:**

Ranging from ANSI 150# -2500# (The max. operating pressure of the wedge flow meter depends upon the pipe class and is limited through the maximum permissible operating pressure of the flange or the end connection)

#### Material:

Carbon steel, Low-temperature carbon steel, Stainless steel, Duplex, Super Duplex, 6 Mo, Aluminium, Monel, Hastelloy, Inconel

## **Mounting Style:**

Flanged/Butt welded/Hub (Possible to install vertically or horizontally)

## **Types of Tappings:**

Flanged, Thread O'let / Socket O'let, Remote Seals

## Wedge Ratio:

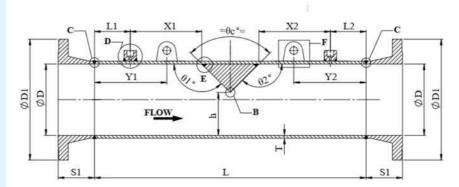
0.2 to 0.6 (Ratio of Wedge height to pipe diameter, determining the discharge coefficient)

## Markings:

Marked with the line size, bore size, material of contsruction and additional technical details as per request

## **Design Specifications:**

#### **WEDGE METER:**



Sizes:DN 50mm - 600mm Design standard: ISO 5167-6 Beta (d/D):  $0.377 \le \beta \le 0.791$ Wedge ratio:  $0.2 \le h/D \le 0.6$ 

Reynolds number: 1×10<sup>4</sup> ≤ ReD ≤ 9×10<sup>6</sup>

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#### **SPECIAL FEATURES**

gas or wet steam.

 Suitable for liquid, gas and steam flow measurement

demanding conditions delivering accurate

repeatable measurements. Well suited for low viscosity liquid or gas and also it can be leveraged to measure wet

- •Cone meter design based on ISO5167-5 industry standards
- Accurate, repeatable and reliable
- Short upstream and the downstream straight requirements
- Low maintenance
- Extended working life

- Oil and Gas Industry
- Power generation
- Water and waste water treatment and distribution
- Chemical Petrochemical and Industries
- Mining and basic materials industry
- All sorts of flow measurements in liquid, gas or steam applications of various industries

## **Design Standards:**

ISO 5167-5 Industry Standards

#### Line Size:

DN 50mm to 500mm (Other sizes on request)

## **Pressure Rating:**

Ranging from ANFI 150# to 2500# (The max. operating pressure depends on the pipe class, the flange and the end connection)

#### **Material:**

Main body- Carbon steel, Low-temperature carbon steel, Stainless steel. Other materials on request (e.g. Duplex SS, Hastelloy, Monel)

Primary element (Cone)-Stainless steel 316/316L (Other materials on request)

## **Mounting Style:**

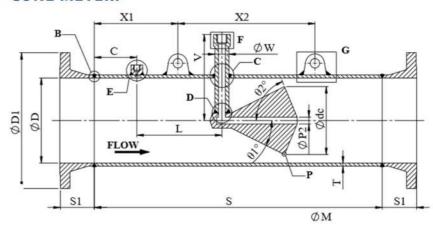
Flanged /Weld end (Others on request)

#### Markings:

Marked with the line size, bore size, material of contsruction and additional technical details as per request

## **Design Specifications:**

#### **CONE METER:**



Sizes:DN 50mm - 500mm Design standard: perISO 5167-5 Beta (d/D):  $0.45 \le \beta \le 0.75$ 

Reynolds number: 8×10<sup>4</sup>≤ReD≤ 1.2×10<sup>7</sup>

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Electromagnetic flow meter works under the principle of Faraday's law of electromagnetic induction. The meter can measure the emf produced from the magnetic field created by the conductive liquids flowing through it. It consists of a transmitter and a sensor which placed inline. Both the transmitter and sensor together measure the flow. Flow meter sensor can measure the induced voltage generated by the fluid passing through the pipe. The transmitter takes the voltage from the sensor and convert it in to a flow measurement.

#### SPECIAL FEATURES

- Bi-Directional Flow Measurement
- Built-in Totalizer
- Remote Monitoring
- Obstruction less and cost effective
- Confirms to international manufacturing standards
- High accurate volumetric flow rate
- Low pressure drop and low maintenance
- Accuracy: ±0.2%; ±0.5%

- Sewage treatment plants
- Coal Slurry
- Pharmaceutical Industry
- Food and Beverages
- Alkalis and acids
- Chemical industry
- Metal and mining industry
- Paper and pulp industry

## Line Size:

DN15mm to 2000mm

## Pressure Rating:

Ranging from ANSI150# to 2500#

## **Body Material:**

SS. CS

## Lining Material:

PTFE, PFA, Rubber

#### **Electrode Material:**

Stainless steel coated with carbonized tungsten, Stainless steel containing MO, Hastelloy C, Hastelloy B, Titanium, Tantalum, Platinum-Iridium alloy

## Supply Voltage:

110V AC, 230V AC, A4V DC

## **Output:**

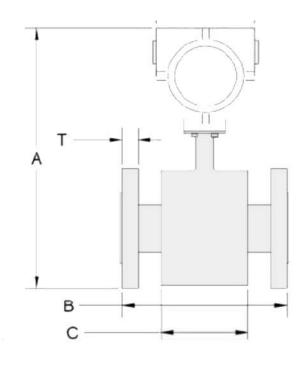
4-20mA. Pulse

## **End Connection:**

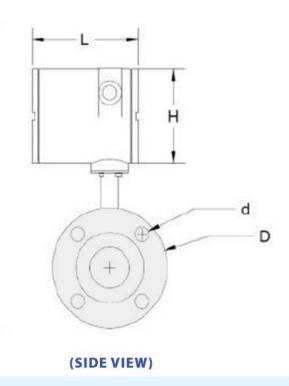
Flanged, Threaded and Clamping

#### Communication:

RS-485, support standard Modbus-RTU protocol, GPRS



(FRONT VIEW)



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# AND PITOT STATIC TUBE

Pitot tube is a primary flow element which is used to measure the flow rate based on the differential pressure measurement principle. By using Bernoulli's principle it can calculate the volumetric flow rate through the calculation of static and dynamic pressure difference.

Average pitot tube uses multiple ports in the upstream section which are positioned at equal annular points. The total pressure developed at each port are averaged within the tube and represented at the head as the high pressure component. A single sensing port located at the downstream section can provide the low pressure component. The differential pressure created by the dynamic force at the inlet and static force at the output, creates the average at the output to enable the flowrate measurement.

## **SPECIAL FEATURES**

- Averaging Pitot Tube is suitable for clean liquid, gas flow measurement
- Accuracy ± 2 % of actual flow rate
- Repeatability of measurement ± 0.2 %
- Short upstream and downstream straight pipe lengths
- Long term accuracy
- Less pressure loss
- Dual averaging for better accuracy
- Lower material cost for large line sizes
- Reduced installation time & cost

- Oil production and refining
- Water treatment and distribution
- Gas processing and transmission
- Chemical and petrochemical industries
- Aerospace Industry

## **Design Standards:**

ISO-3966

#### Line Size:

DN 50mm to 2000mm (1" to 80")

## Pressure rating:

Ranging from ANSI 150# to ANSI 2500#

## **Averaging Pitot Tube Material**

Stainless Steel, Duplex, Super Duplex, 6 Mo, Monel 400 and Inconel 625 (additional material on request)

## Mounting style:

Flanged, Compression Fittings

## Tapping type:

Flanged / NPT / Socket Weld

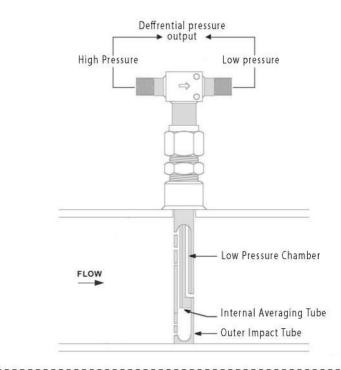
## Reynolds number:

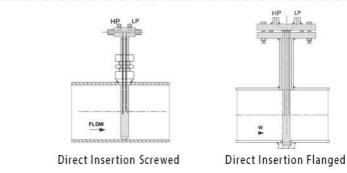
Ranging from 104 up to 107

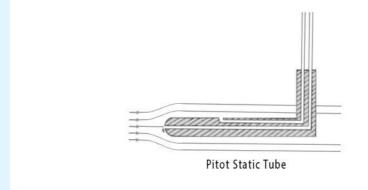
## Marking:

Marked with the line size, bore size, material of construction and additional technical details as per request

## **Design Specifications:**







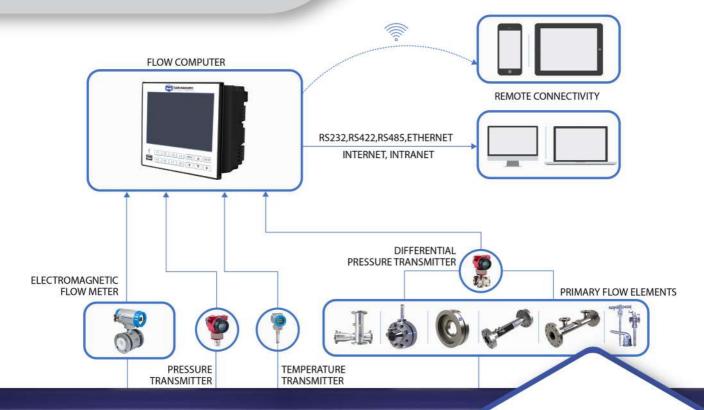
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# FLOW COMPUTER

The measurement details from the various Flow Meters will be received to the Back-end CPU, the flow computer which will process, display and send the data to Server. The flow computer is designed specifically for use in reception of various flow measurement data reception and logical calculations display, transmission to back end etc. The field data differential pressure flow measurement. electromagnetic flow measurement, etc from many kinds of flow meter sensor or transmitter is essential for logical calculation, display, transmission for getting the various details about the flow parameters.



#### **SPECIAL FEATURES**

- For gas and liquid flow measurement, single or multi stream
- Easy setup and operation
- · Realtime monitoring and historical data back up
- Individual Meter and total system diagnostics
- Additional data logging storage facility
- Alarm setting and performance monitoring
- · Remote access and e reporting

- Oil and Gas Industry
- Water and Waste Water Industry
- Pharmaceutical Industry
- Food and Beverages
- Chemical industry
- Metal and mining industry
- Paper and pulp industry

## Inputs:

- · 3 Channels for P.DP and T 4-20mA,0-20mA,0-5V,1-5V,0-10V,0-50mV
- · Volumetric input flow rate from flow instruments.

## Readings:

- · Totalized flow
- · Flow rate calculation using primary flow elementbased on ISO-5167
- · Continuous memory, stores last reading of the totalized flow
- · Registers maximum and minimum readings of

## **Power Supply:**

- · Current mode switching power supply.
- \* 85-260VAC, 6 W, 45...65 Hz.
- \* 20-60VDC, 6 W, (optional)

## **Outputs:**

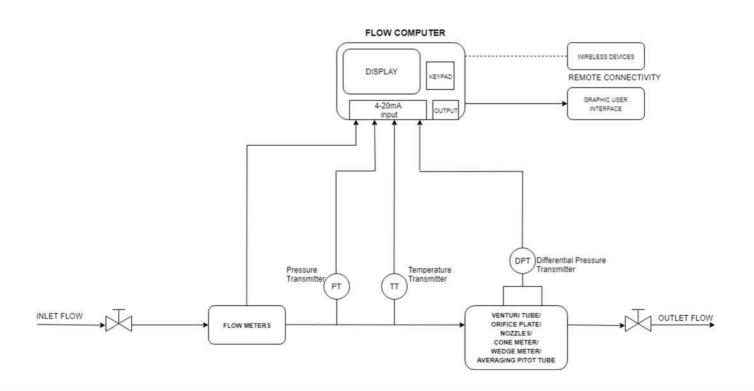
· Relays, 2 outputs for alarms 250VAC/3A., normally open or normally close by soft-

#### Optional:

- \* 4-20mA, loop powered, Vdrop 4.5V max. opto isolated (5kV).
- \* 4-20mA, Active loop, opto isolated (5kV).
- \* 0-10V, opto isolated (5kV).
- \* RS485 modbus RTU serial communications. opto isolated (5kV).

#### Communications:

· RS485 Modbus RTU serial communications/ wireless communications reports data to a PC/PLC/Handheld devices



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# CONTACT AND ADDRESS



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