



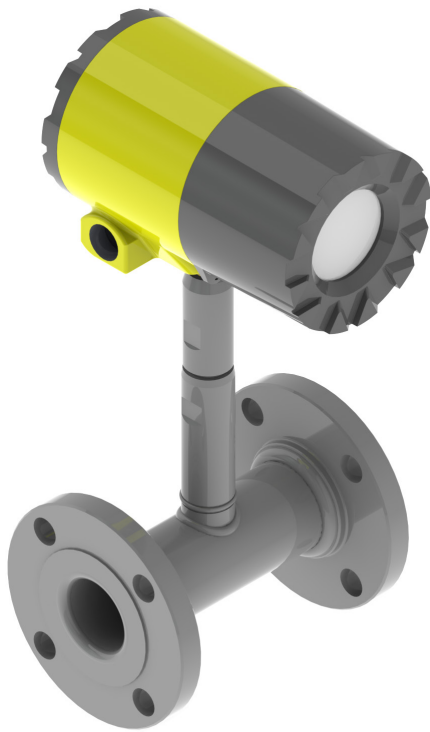
**Armstrong In-Line and Insertion  
Vortex Flow Meters**



## In-Line Vortex Flow Meter

Armstrong International is pleased to offer vortex technology for measurement of steam, liquid, and gas flows. All AVF in-line models provide multivariable measurement and mass flow output for applications in industrial and institutional environments.

The flow meter is available from ½" (15 mm) (DN 15) to 12" (300 mm) (DN 300) meter sizes handling process temps from -330°F (-200°C) to 750°F (400°C) and process connections up to ANSI Class 600 (PN 64). Multivariable options include temperature, pressure, and velocity measurements for a fully compensated mass flow rate. Output communication is available via analog 4-20ma, HART™ protocol, Modbus, and BACnet™.



**Flanged Connection**



**Wafer Connection**

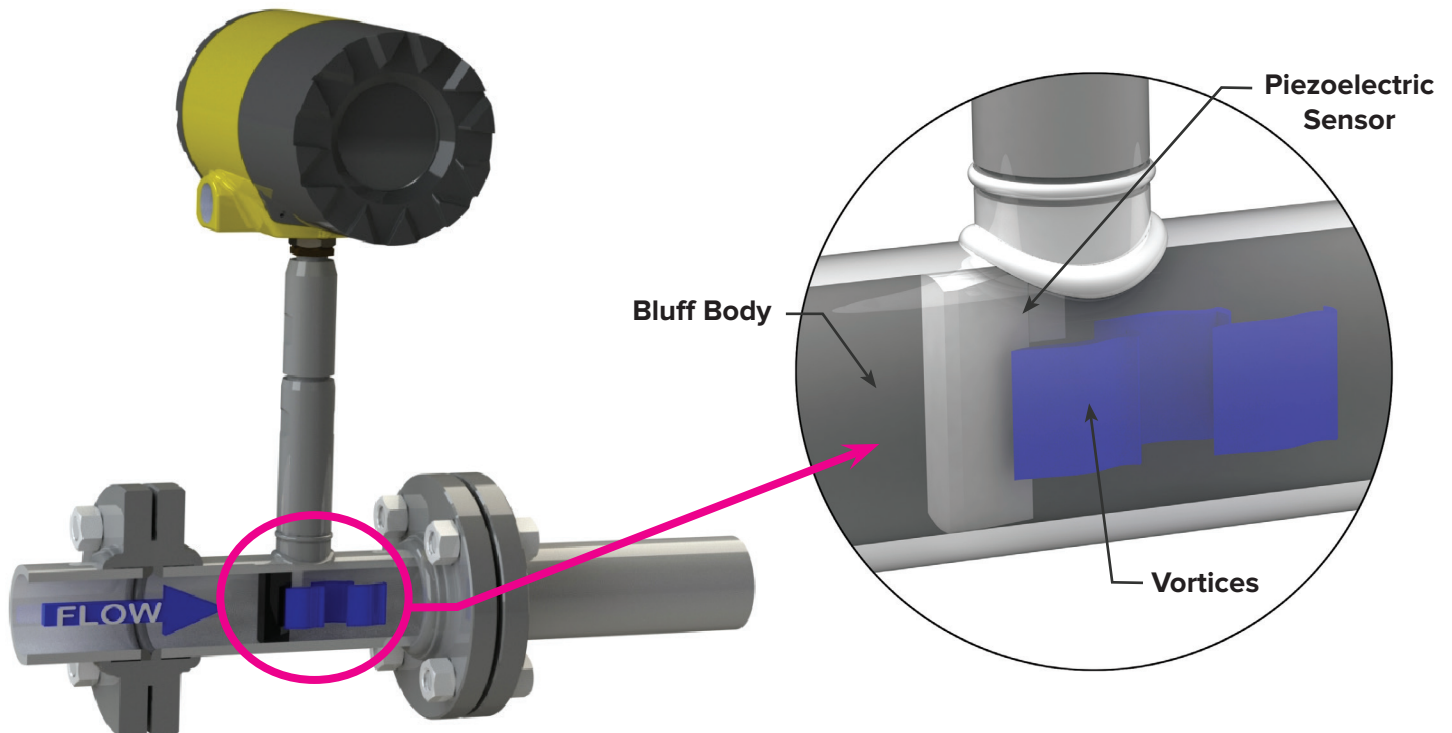
### Features

- Volumetric or mass flow
- Velocity, temperature, pressure measurements integral to meter body
- Energy calculation and output available
- 1.5% of rate accuracy or better
- Turndown up to 100:1
- Push button digital display
- Remote electronics available
- FM, FMC, ATEX, IECEx - Approvals Pending

## Vortex Shedder Technology

Since the early 1970s, vortex meters have been used as a versatile, reliable measurement solution. Applicable in a variety of fluids, vortex meters can be easily installed and deliver accurate measurement over a potentially impressive turndown.

Based on the Kármán vortex street, a vortex meter measures the frequency of vortices that are shed behind a bluff body that is placed in a flow stream. As each vortex is shed, it creates high and low pressure zones which are sensed by a piezoelectric crystal. The flow meter's electronics convert these pressure pulses into electrical signals. Because the frequency of the vortices is directly proportional to the fluid's velocity, the electric signals can be used to calculate a flow rate.



## Multivariable Options

### V1 – Volumetric

Simply measures velocity and provides a volumetric flow rate. Typical for water and non-compressible fluid applications.

### V2 – Velocity and Temperature

Added temperature measurement via integral RTD is used to calculate compensated mass flow rate. Typical for saturated steam flows.

### V3 – Velocity, Temperature, and Pressure

Integral temperature and pressure sensors for fully compensated mass flow calculations. Capable of providing 3 outputs from a choice of 5 different process measurements: volumetric flow rate, mass flow rate, pressure, temperature, and density.

### E1 – Energy

Energy measurement (Btu, joules, calories, Watt-hours, Megawatt-hours, HP-hours) using integral temperature reading for either supply or return side. Must be paired with a second temperature sensor on the opposite side (supply or return) of the process.



## Performance Specifications

| Accuracy   |                     |                     |
|--|---------------------|---------------------|
| Variable   | Liquids             | Gas & Steam         |
| Volumetric Flow Rate   | ±0.7% of rate       | ±1.0% of rate       |
| Mass Flow Rate   | ±1.0 % of rate      | ±1.5% of rate       |
| Temperature  | ±2.0°F (±1°C)       | ±2.0°F (±1°C)       |
| Pressure   | ±0.3% of full scale | ±0.3% of full scale |
| Density  | ±0.3% of reading    | ±0.5% of reading    |
| <b>*Mass flow rate accuracy of gas and steam is based on 50-100% of pressure range</b> |                     |                     |

| Repeatability                    |                      |
|----------------------------------|----------------------|
| Mass Flow Rate                   | ±0.2% of rate        |
| Volumetric Flow Rate             | ±0.1% of rate        |
| Temperature                      | ±0.2°F (±0.1°C)      |
| Pressure                         | ±0.05% of full scale |
| Density                          | ±0.1% of reading     |
| Stability Over 12 Months         |                      |
| Mass Flow Rate                   | ±0.2% of rate        |
| Volumetric Flow Rate             | Negligible           |
| Temperature                      | ±0.9°F (±0.5°C)      |
| Pressure                         | ±0.1% of full scale  |
| Density                          | ±0.1% of reading     |
| Response Time                    |                      |
| Adjustable from 1 to 100 seconds |                      |

| Process and Ambient Temperature       |                                   |
|---------------------------------------|-----------------------------------|
| Process Standard Temperature (code T) | -330°F to 500°F (-200°C to 260°C) |
| Process High Temperature (code H)     | -330°F to 750°F (-200°C to 400°C) |
| Ambient Operating                     | -40°F to 140°F (-40°C to 60°C)    |
| Ambient Storage                       | -40°F to 185°F (-40°C to 85°C)    |
| Pressure Transducer Ratings           |                                   |
| Full Scale Operating Pressure         | Max. Over-Range Pressure          |
| 30 psia (2 bara)                      | 60 psia (4 bara)                  |
| 100 psia (7 bara)                     | 200 psia (14 bara)                |
| 300 psia (20 bara)                    | 600 psia (40 bara)                |
| 500 psia (35 bara)                    | 1000 psia (70 bara)               |
| 1500 psia (100 bara)                  | 2500 psia (175 bara)              |

| Power Requirements   |  |
|--|--|
| LP Option  | 12-36 VDC, 25mA, 1W max  |
| DC Option  | 12-36 VDC, 300mA, 9W max   |
| AC Option  | 100-240 VAC, 50/60Hz line power, 5W                                  |
| Output Signals   |  |
| Analog   | 4-20 mA  |
| Alarm  | Solid state relay, 40 VDC  |
| Totalizer Pulse  | 50 millisecond pulse, 40 VDC   |
| Volumetric or LP Mass  | One analog, one totalizer pulse, HART™                               |
| Multivariable  | Up to three analog signals, three alarms, one totalizer pulse, HART™ |
| Multivariable  | Modbus or BACnet™ process monitoring                                 |
| Display  |  |
| Alphanumeric 2 line x 16 character LCD digital display                             |  |
| Six pushbuttons for full field configuration                                       |  |
| Pushbuttons can be operated with magnetic wand without removal of enclosure covers |  |
| Display can be mounted in 90° intervals for better viewing                         |  |

# AVF Specifications & Sizing

## Physical Specifications

| Wetted Materials    |   |
|---------------------|---|
| Standard            | 316L Stainless Steel  |
| Optional            | Carbon Steel or Hastelloy C   |
| Approvals (Pending) |   |
| FM, FMC             | CLASS I, DIV. 1, GROUPS B, C, D<br>CLASS II/III, DIV. 1, GROUPS E, F, G<br>Type 4X and IP66, T6, Ta = -40°C to 60°C |
| ATEX                | II 2 G Ex d IIB + H2 T6<br>II 2 D EX tD A21 IP66 T85°C, Ta = -40°C to 60°C  |
| IECEX               | Ex d IIB + H2 T6<br>Ex tD A21 IP66 T85°C, Ta = -40°C to 60°C  |

## Sizing Considerations

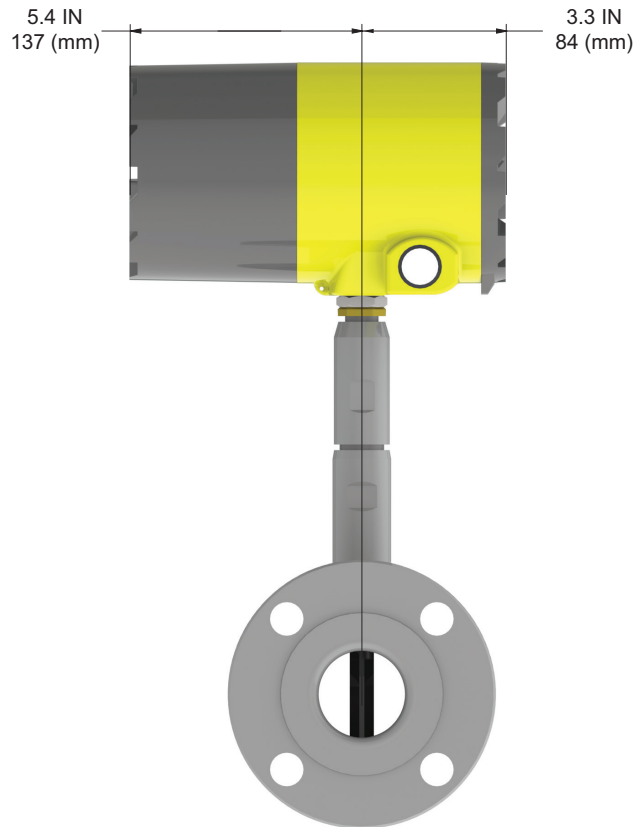
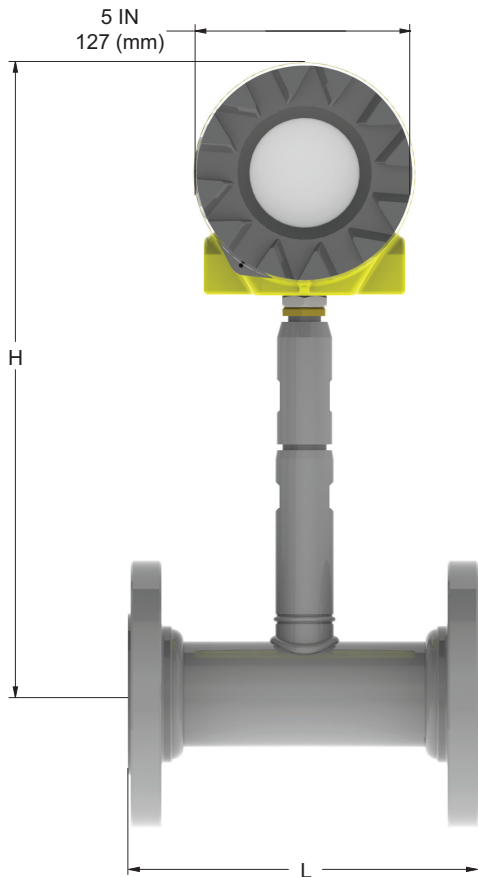
| Required Straight Piping Conditions      |                    |            |
|--|--------------------|------------|
| Condition                                | Pipe Diameters (D) |            |
|  | Upstream           | Downstream |
| One 90° elbow before meter               | 10D                | 5D         |
| Two 90° elbow before meter               | 15D                | 5D         |
| Two 90° elbows out of plane before meter | 25D                | 5D         |
| Reduction before meter                   | 10D                | 5D         |
| Expansion before meter                   | 20D                | 5D         |
| Partially open valve before meter        | 25D                | 5D         |

| Velocity Range                 |  |
|--------------------------------|--|
| Maximum velocity, liquid       | 30 ft/sec (9 m/sec)  |
| Minimum velocity, liquid       | 1 ft/sec (0.3 m/sec)   |
| Maximum velocity, gas or steam | 300 ft/sec (90 m/sec)  |
| Minimum velocity, gas or steam | $\frac{5}{\sqrt{\text{density (Lb/ft}^3\text{)}}}$ for ft/sec<br>$\frac{6.1}{\sqrt{\text{density (kg/m}^3\text{)}}}$ for m/sec |



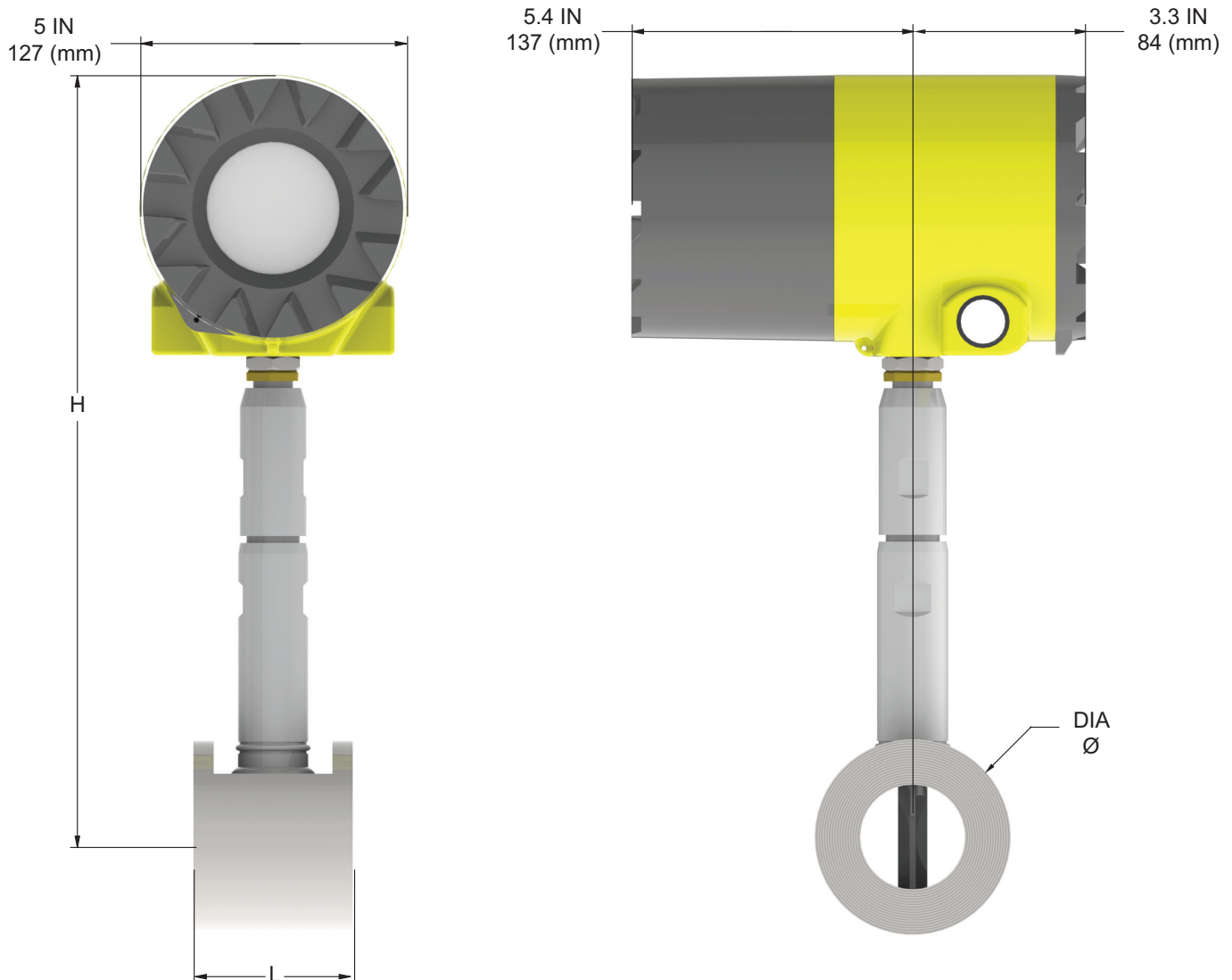
# AVF Dimensions - Flanged

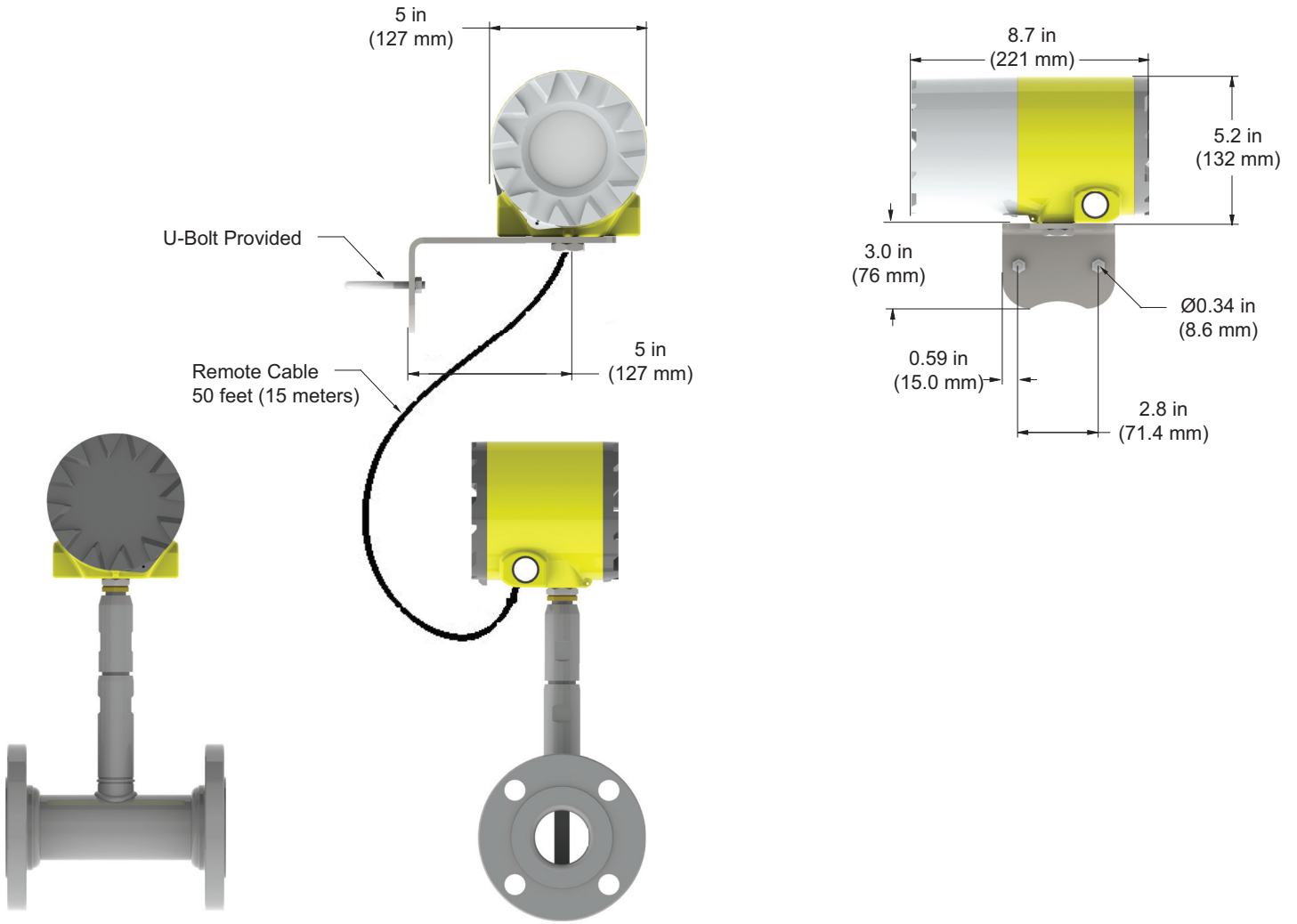
| Model AVF<br>Class 150, 300, 600, and PN 16, PN 40, PN 64 |                 |                 |
|---|-----------------|-----------------|
| Nominal Size  | L Dim           | H Dim           |
| ½ inch (15 mm)  | 7.88" (200 mm)  | 13.40" (340 mm) |
| ¾ inch (20 mm)  | 7.88" (200 mm)  | 13.50" (343 mm) |
| 1 inch (25 mm)  | 7.88" (200 mm)  | 13.60" (345 mm) |
| 1 ½ inch (40 mm)  | 7.88" (200 mm)  | 13.90" (353 mm) |
| 2 inch (50 mm)  | 7.88" (200 mm)  | 14.20" (361 mm) |
| 3 inch (80 mm)  | 7.88" (200 mm)  | 14.70" (373 mm) |
| 4 inch (100 mm)   | 9.85" (250 mm)  | 15.20" (386 mm) |
| 6 inch (150 mm)   | 11.82" (300 mm) | 16.30" (414 mm) |
| 8 inch (200 mm)   | 11.82" (300 mm) | 17.30" (439 mm) |
| 10 inch (250 mm)  | 14.79" (376 mm) | 18.30" (465 mm) |
| 12 inch (300 mm)  | 17.73" (450 mm) | 19.30" (490 mm) |



# AVF Dimension - Wafer

| Model AVF-W<br>Wafer ANSI Class 600 |               |                 |                |
|-------------------------------------|---------------|-----------------|----------------|
| Nominal Size                        | L Dim         | H Dim           | Diameter Ø     |
| ½ inch (15 mm)                      | 2.56" (65 mm) | 13.60" (345 mm) | 1.38" (35 mm)  |
| ¾ inch (20 mm)                      | 2.56" (65 mm) | 13.60" (345 mm) | 1.69" (43 mm)  |
| 1 inch (25 mm)                      | 2.56" (65 mm) | 13.60" (345 mm) | 2.00" (51 mm)  |
| 1 ½ inch (40 mm)                    | 2.56" (65 mm) | 13.90" (353 mm) | 2.88" (73 mm)  |
| 2 inch (50 mm)                      | 2.56" (65 mm) | 14.10" (358 mm) | 3.62" (92 mm)  |
| 3 inch (80 mm)                      | 2.56" (65 mm) | 14.60" (371 mm) | 5.00" (127 mm) |
| 4 inch (100 mm)                     | 2.56" (65 mm) | 15.10" (384 mm) | 6.19" (157 mm) |





**Remote electronics option available on all models**



# AVF Ordering Information

| Product Code                 |   |
|------------------------------|---|
| <b>AVF</b>                   | Armstrong Inline Vortex   |
| <b>Process Connections</b>   |   |
| <b>150</b>                   | ANSI 150# Flange  |
| <b>300</b>                   | ANSI 300# Flange  |
| <b>600</b>                   | ANSI 600# Flange  |
| <b>W</b>                     | Wafer ANSI 600#   |
| <b>16</b>                    | PN 16   |
| <b>40</b>                    | PN 40   |
| <b>64</b>                    | PN 64   |
| <b>Body Size</b>             |   |
| <b>05</b>                    | ½ inch nominal bore (15 mm)   |
| <b>75</b>                    | ¾ inch nominal bore (20 mm)   |
| <b>1</b>                     | 1 inch nominal bore (25 mm)   |
| <b>15</b>                    | 1 ½ inch nominal bore (40 mm)   |
| <b>2</b>                     | 2 inch nominal bore (50 mm)   |
| <b>3</b>                     | 3 inch nominal bore (80 mm)   |
| <b>4</b>                     | 4 inch nominal bore (100 mm)  |
| <b>6</b>                     | 6 inch nominal bore (150 mm)  |
| <b>8</b>                     | 8 inch nominal bore (200 mm)  |
| <b>10</b>                    | 10 inch nominal bore (250 mm)   |
| <b>12</b>                    | 12 inch nominal bore (300 mm)   |
| <b>Body Material</b>         |   |
| <b>SS</b>                    | 316 Stainless Steel   |
| <b>CS</b>                    | Carbon Steel  |
| <b>H</b>                     | Hastelloy   |
| <b>Electronics</b>           |   |
| <b>D</b>                     | NEMA 4X Enclosure   |
| <b>R1</b>                    | Remote NEMA 4X Enclosure, 50 foot cable (15 meters)   |
| <b>R2</b>                    | Remote NEMA 4X Enclosure, 25 foot cable (7 meters)  |
| <b>Multivariable Options</b> |   |
| <b>V1</b>                    | Volumetric  |
| <b>V2</b>                    | Velocity, Temperature   |
| <b>V3</b>                    | Velocity, Temperature, Pressure   |
| <b>V4</b>                    | Velocity, Temperature, External Pressure  |
| <b>E1</b>                    | Energy  |
| <b>E2</b>                    | Energy, Pressure  |
| <b>Input Power</b>           |   |
| <b>LP</b>                    | 12-36VDC, 25mA, 1W max, loop powered, output option 1 only                                      |
| <b>DC</b>                    | 12-36VDC, 300mA, 9W max, output options 2, 3, 4, 5, 6, 7  |
| <b>AC</b>                    | 10-240VAC, 5W max, output options 2, 3, 4, 5, 6, 7  |
| <b>Output</b>                |   |
| <b>1</b>                     | One 4-20mA analog output, scaled frequency, one pulse, HART™, LP power only                     |
| <b>2</b>                     | One 4-20mA analog output, scaled frequency, one alarm, one pulse, HART™, DC or AC power         |
| <b>3</b>                     | One 4-20mA analog output, scaled frequency, one alarm, one pulse, Modbus, DC or AC power        |
| <b>4</b>                     | One 4-20mA analog output, scaled frequency, one alarm, one pulse BACnet™, DC or AC power        |
| <b>5</b>                     | Three 4-20mA analog outputs, scaled frequency, three alarms, one pulse, HART™, DC or AC power   |
| <b>6</b>                     | Three 4-20mA analog outputs, scaled frequency, three alarms, one pulse, Modbus, DC or AC power  |
| <b>7</b>                     | Three 4-20mA analog outputs, scaled frequency, three alarms, one pulse, BACnet™, DC or AC power |
| <b>Temperature Options</b>   |   |
| <b>T</b>                     | Standard temperature, Process temperature -330°F - 500°F (-200°C - 260°C)                       |
| <b>H</b>                     | High temperature, Process temperature up to 750°F (400°C)                                       |
| <b>Pressure Options</b>      |   |
| <b>N</b>                     | No pressure sensor  |
| <b>1</b>                     | Maximum 30 psia (2 bara), Proof 60 psia (4 bara)  |
| <b>2</b>                     | Maximum 100 psia (7 bara), Proof 200 psia (14 bara)   |
| <b>3</b>                     | Maximum 300 psia (20 bara), Proof 600 psia (41 bara)  |
| <b>4</b>                     | Maximum 500 psia (34 bara), Proof 1000 psia (64 bara)   |
| <b>5</b>                     | Maximum 1500 psia (100 bara), Proof 2500 psia (175 bara)  |

AVF 150 4 SS D V2 DC 2 T N

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit [armstronginternational.com/veris](http://armstronginternational.com/veris) for up-to-date information.

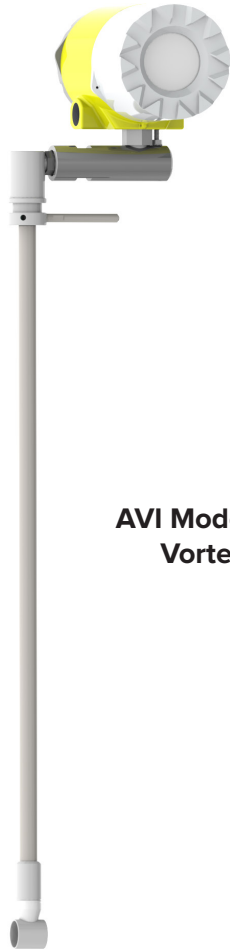


# Insertion Vortex Flow Meter

## Introducing the Insertion Vortex Flow Meter

The AVI insertion models provide all the same multivariable measurement and mass flow output features as the AVF in-line model in a robust, welded design.

The AVI is available for pipe sizes 2" (50 mm) (DN 50) and above with either flanged or NPT process connections up to ANSI Class 600 (PN64). Optional retractor tool provides easy hot-tap installation and removal.



**AVI Model Insertion  
Vortex Meter**



**AVI Model with Packing Gland  
and Retractor Options**

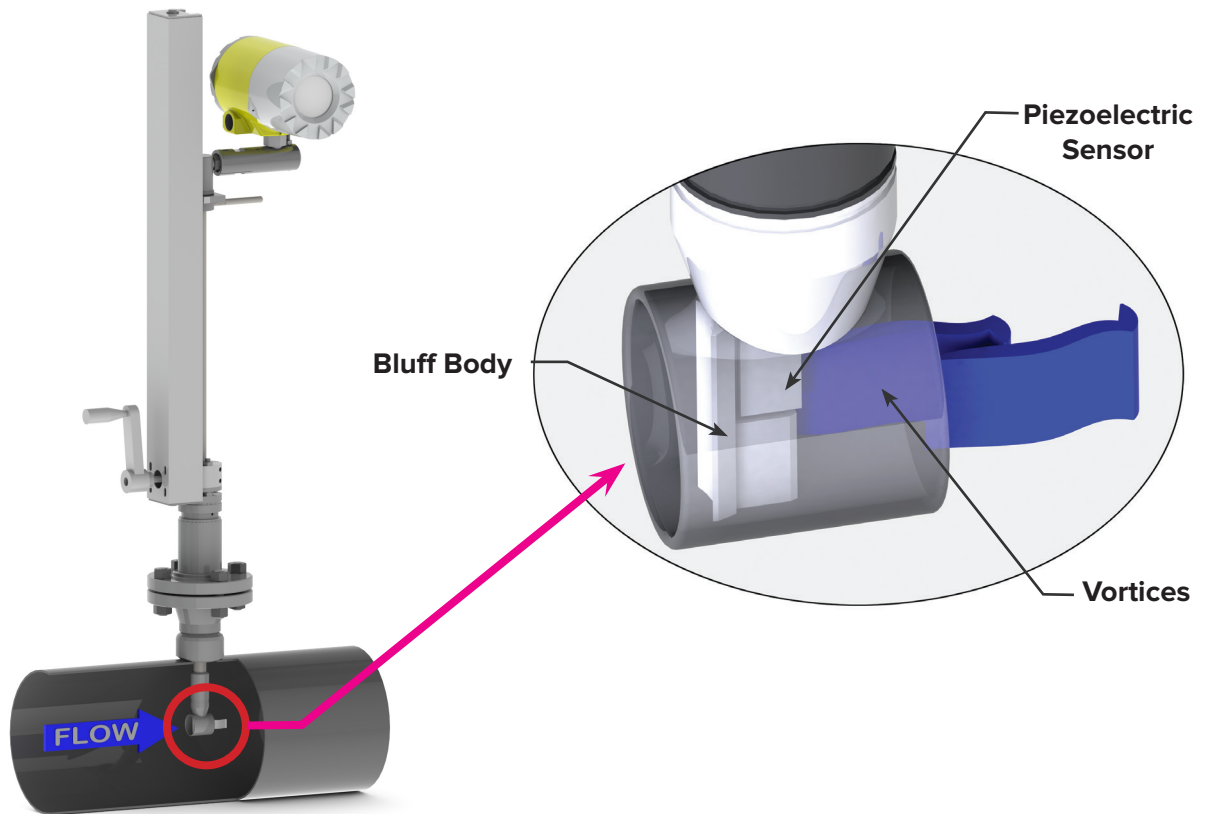
## Features

- Compensated mass flow and energy calculations for gases, liquids, and steam
- Hot tap installation does not require shut down or process interruption
- Up to  $\pm 1.5\%$  accuracy over a wide turndown in flow rates
- Reliable construction – no moving parts
- Analog, HART™, Modbus, and BACnet™ communication
- FM, FMC, ATEX, IECEx Approvals Pending

## Insertion Meter Measurement Principle

The insertion vortex utilizes the same operating principle of the in-line meter. However, rather than placing a bluff body across the entire pipe ID, the bluff body is strategically placed in a position within the pipe to measure a single local velocity and yield an average volumetric flow rate.

Multivariable measurement is available through the incorporation of temperature and pressure sensors for an output of compensated mass flow rate for gases, liquids, and steam.



## Sizing Considerations

| Required Straight Piping Conditions      |                    |            |
|--|--------------------|------------|
| Condition                                | Pipe Diameters (D) |            |
|  | Upstream           | Downstream |
| One 90° elbow before meter               | 10D                | 5D         |
| Two 90° elbow before meter               | 15D                | 5D         |
| Two 90° elbows out of plane before meter | 25D                | 5D         |
| Reduction before meter                   | 10D                | 5D         |
| Expansion before meter                   | 20D                | 5D         |
| Partially open valve before meter        | 25D                | 5D         |

| Velocity Range                 |   |
|--------------------------------|---|
| Maximum velocity, liquid       | 30 ft/sec (9 m/sec)   |
| Minimum velocity, liquid       | 1 ft/sec (0.3 m/sec)  |
| Maximum velocity, gas or steam | 300 ft/sec (90 m/sec)   |
| Minimum velocity, gas or steam | $\frac{5}{\sqrt{\text{density (Lb/ft}^3\text{)}}}$ for ft/sec |
|                                | $\frac{6.1}{\sqrt{\text{density (kg/m}^3\text{)}}}$ for m/sec |



## Performance Specifications

| Accuracy   |                     |                     |
|--|---------------------|---------------------|
| Variable   | Liquids             | Gas & Steam         |
| Volumetric Flow Rate   | ±1.2% of rate       | ±1.5% of rate       |
| Mass Flow Rate   | ±1.5 % of rate      | ±2.0% of rate       |
| Temperature  | ±2.0°F (±1°C)       | ±2.0°F (±1°C)       |
| Pressure   | ±0.3% of full scale | ±0.3% of full scale |
| Density  | ±0.3% of reading    | ±0.5% of reading    |
| <b>*Mass flow rate accuracy of gas and steam is based on 50-100% of pressure range</b> |                     |                     |

| Repeatability                    |                      |
|----------------------------------|----------------------|
| Mass Flow Rate                   | ±0.2% of rate        |
| Volumetric Flow Rate             | ±0.1% of rate        |
| Temperature                      | ±0.2°F (±0.1°C)      |
| Pressure                         | ±0.05% of full scale |
| Density                          | ±0.1% of reading     |
| Stability Over 12 Months         |                      |
| Mass Flow Rate                   | ±0.2% of rate        |
| Volumetric Flow Rate             | Negligible           |
| Temperature                      | ±0.9°F (±0.5°C)      |
| Pressure                         | ±0.1% of full scale  |
| Density                          | ±0.1% of reading     |
| Response Time                    |                      |
| Adjustable from 1 to 100 seconds |                      |

| Process and Ambient Temperature       |                                   |
|---------------------------------------|-----------------------------------|
| Process Standard Temperature (code T) | -330°F to 500°F (-200°C to 260°C) |
| Process High Temperature (code H)     | -330°F to 750°F (-200°C to 400°C) |
| Ambient Operating                     | -40°F to 140°F (-40°C to 60°C)    |
| Ambient Storage                       | -40°F to 185°F (-40°C to 85°C)    |
| Pressure Transducer Ratings           |                                   |
| Full Scale Operating Pressure         | Max. Over-Range Pressure          |
| 30 psia (2 bara)                      | 60 psia (4 bara)                  |
| 100 psia (7 bara)                     | 200 psia (14 bara)                |
| 300 psia (20 bara)                    | 600 psia (40 bara)                |
| 500 psia (35 bara)                    | 1000 psia (70 bara)               |
| 1500 psia (100 bara)                  | 2500 psia (175 bara)              |

| Power Requirements   |  |
|--|--|
| LP Option  | 12-36 VDC, 25mA, 1W max  |
| DC Option  | 12-36 VDC, 300mA, 9W max   |
| AC Option  | 100-240 VAC, 50/60Hz line power, 5W                                  |
| Output Signals   |  |
| Analog   | 4-20 mA  |
| Alarm  | Solid state relay, 40 VDC  |
| Totalizer Pulse  | 50 millisecond pulse, 40 VDC   |
| Volumetric or LP Mass  | One analog, one totalizer pulse, HART™                               |
| Multivariable  | Up to three analog signals, three alarms, one totalizer pulse, HART™ |
| Multivariable  | Modbus or BACnet™ process monitoring                                 |
| Display  |  |
| Alphanumeric 2 line x 16 character LCD digital display                             |  |
| Six pushbuttons for full field configuration                                       |  |
| Pushbuttons can be operated with magnetic wand without removal of enclosure covers |  |
| Display can be mounted in 90° intervals for better viewing                         |  |

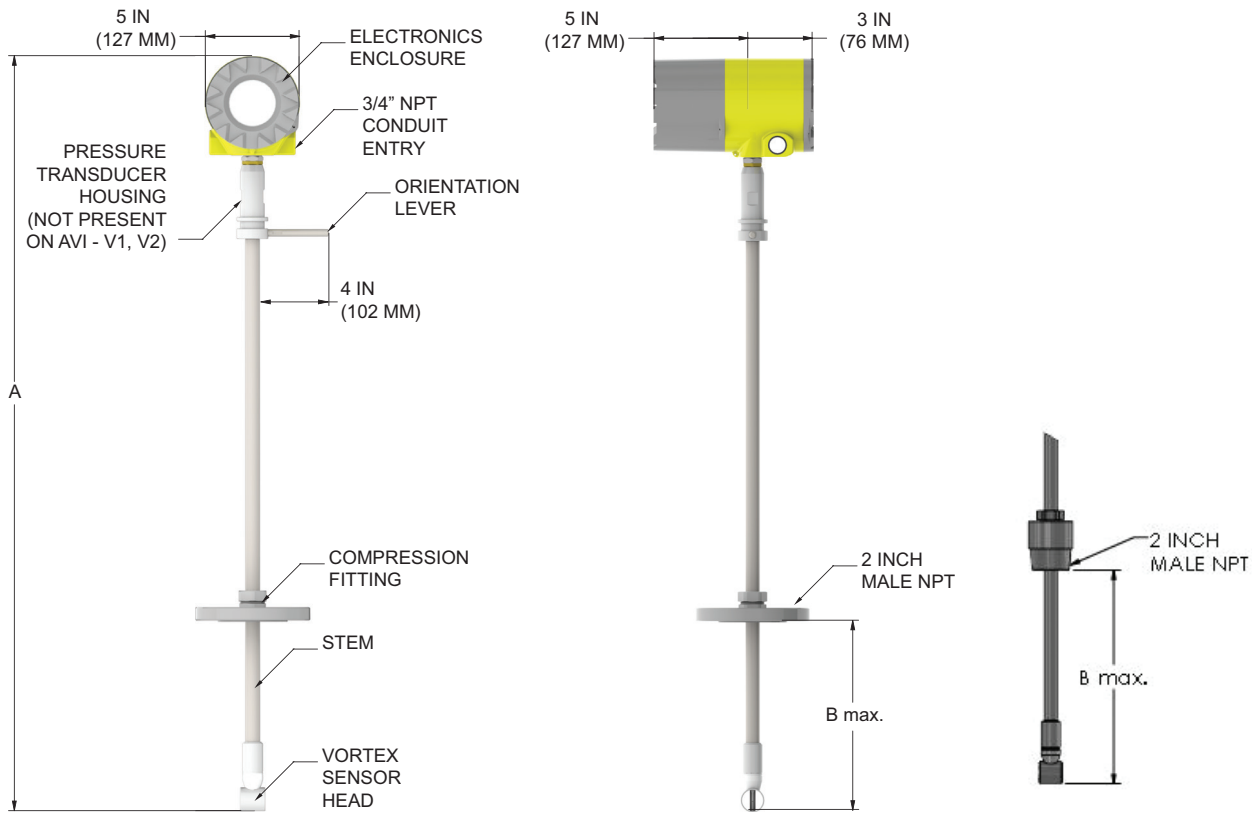
## Operating Specifications

| Pressure Ratings                    |                        |                    |          |
|-------------------------------------|------------------------|--------------------|----------|
| Style Connection                    | Process                | Rating Code        | Ordering |
| Compression Fitting                 | 2" (50 mm) MNPT        | ANSI 600#          | CT8      |
|                                     | 2" (50 mm) 150# flange | ANSI 150#          | CF8150   |
|                                     | 2" (50 mm) 300# flange | ANSI 300#          | CF8300   |
|                                     | 2" (50 mm) 600# flange | ANSI 600#          | CF8600   |
| Packing Gland                       | 2" (50 mm) MNPT        | 50 psig (3.5 barg) | PT8      |
|                                     | 2" (50 mm) 150# flange | 50 psig (3.5 barg) | PF8150   |
|                                     | 2" (50 mm) 300# flange | 50 psig (3.5 barg) | PF8300   |
| Packing Gland & Removable Retractor | 2" (50 mm) MNPT        | ANSI 300#          | PT8RR    |
|                                     | 2" (50 mm) 150# flange | ANSI 150#          | PF8150RR |
|                                     | 2" (50 mm) 300# flange | ANSI 300#          | PF8300RR |
| Packing Gland & Permanent Retractor | 2" (50 mm) MNPT        | ANSI 600#          | PT8R     |
|                                     | 2" (50 mm) 150# flange | ANSI 150#          | PF8150R  |
|                                     | 2" (50 mm) 300# flange | ANSI 300#          | PF8300R  |
|                                     | 2" (50 mm) 600# flange | ANSI 600#          | PF8600R  |

## Physical Specifications

| Wetted Materials  |   |
|---|---|
| Standard  | 316L Stainless Steel  |
| DuPont Teflon based thread sealant on models with pressure transducer   |   |
| DuPont Teflon packing on standard temperature models with packing gland |   |
| Graphite based packing on high temperature models with packing gland    |   |
| Approvals (Pending)   |   |
| FM, FMC   | CLASS I, DIV. 1, GROUPS B, C, D<br>CLASS II/III, DIV. 1, GROUPS E, F, G<br>Type 4X and IP66, T6, Ta = -40°C to 60°C |
| ATEX  | II 2 G Ex d IIB + H2 T6<br>II 2 D EX tD A21 IP66 T85°C, Ta = -40°C to 60°C  |
| IECEX   | Ex d IIB + H2 T6<br>Ex tD A21 IP66 T85°C, Ta = -40°C to 60°C  |

## AVI Compression Fitting Models

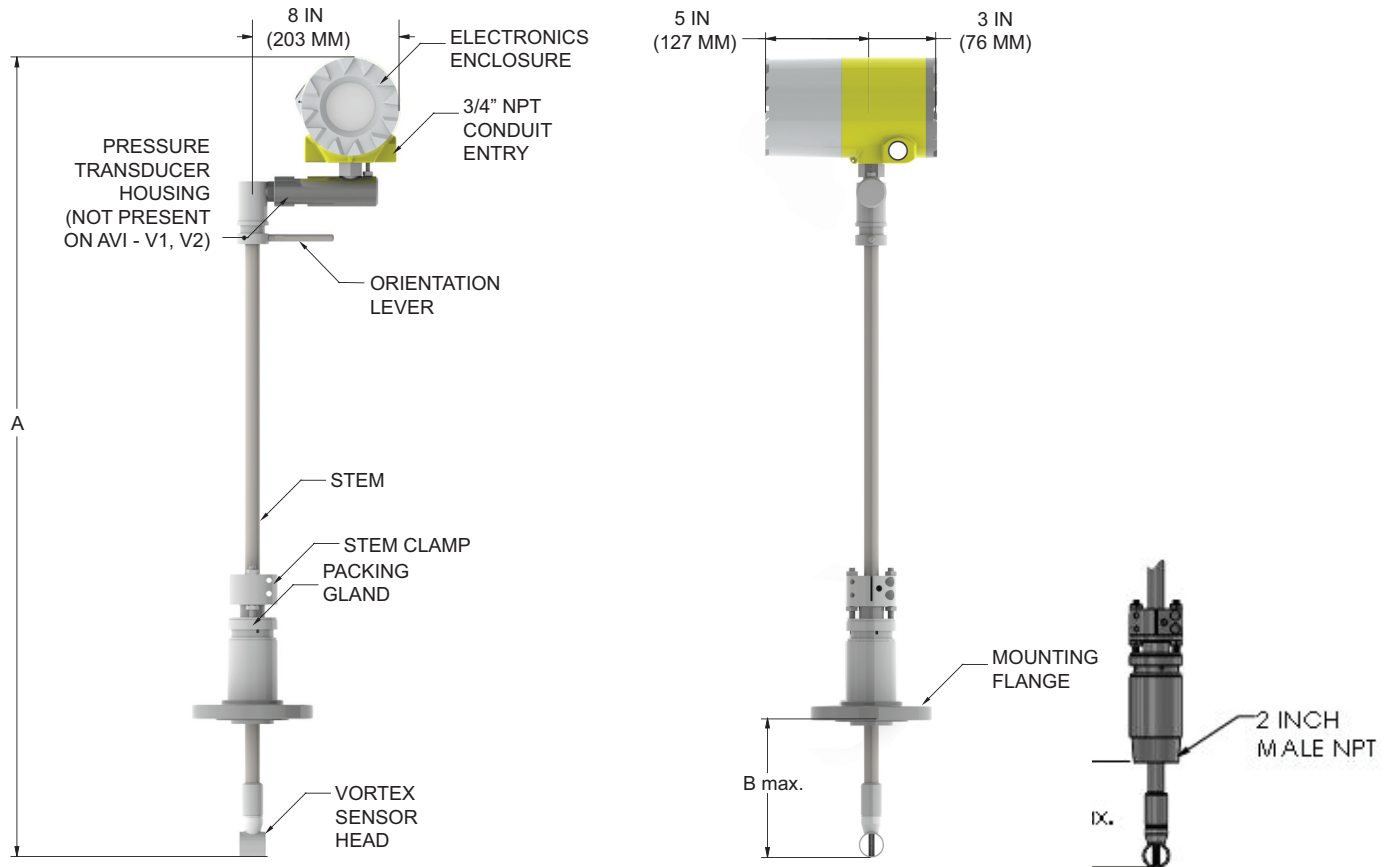


| Model AVI - V1, V2 |  | CL/Comp Act Length in (mm) |            | SL/Standard Length in (mm) |            | EL/Extended Length in (mm) |            |
|--------------------|--|----------------------------|------------|----------------------------|------------|----------------------------|------------|
|                    |  | A                          | B          | A                          | B          | A                          | B          |
| CT8                | Compression Fitting, Male NPT              | 21.6 (549)                 | 9.8 (249)  | 38.0 (965)                 | 26.2 (665) | 50 (1 270)                 | 38.2 (970) |
| CF8150             | Compression Fitting, 2 Inch, 150 LB Flange | 21.6 (549)                 | 10.9 (277) | 38.0 (965)                 | 27.3 (693) | 50 (1 270)                 | 39.3 (998) |
| CF5016             | Compression Fitting, DN50, PN16 Flange     | 21.6 (549)                 | 10.9 (277) | 38.0 (965)                 | 27.3 (693) | 50 (1 270)                 | 39.3 (998) |
| CF8300             | Compression Fitting, 2 Inch, 300 LB Flange | 21.6 (549)                 | 10.8 (274) | 38.0 (965)                 | 27.2 (691) | 50 (1 270)                 | 39.2 (996) |
| CF5040             | Compression Fitting, DN50, PN40 Flange     | 21.6 (549)                 | 10.8 (274) | 38.0 (965)                 | 27.2 (691) | 50 (1 270)                 | 39.2 (996) |
| CF8600             | Compression Fitting, 2 Inch, 600 LB Flange | 21.6 (549)                 | 10.4 (264) | 38.0 (965)                 | 26.8 (681) | 50 (1 270)                 | 38.8 (986) |
| CF5064             | Compression Fitting, DN50, PN64 Flange     | 21.6 (549)                 | 10.4 (264) | 38.0 (965)                 | 26.8 (681) | 50 (1 270)                 | 38.8 (986) |

| Model AVI - V3 |  | CL/Comp Act Length in (mm) |            | SL/Standard Length in (mm) |            | EL/Extended Length in (mm) |            |
|----------------|--|----------------------------|------------|----------------------------|------------|----------------------------|------------|
|                |  | A                          | B          | A                          | B          | A                          | B          |
| CT8            | Compression Fitting, Male NPT              | 24.6 (625)                 | 9.8 (249)  | 41.0 (1 041)               | 26.2 (665) | 53 (1 346)                 | 38.2 (970) |
| CF8150         | Compression Fitting, 2 Inch, 150 LB Flange | 24.6 (625)                 | 10.9 (277) | 41.0 (1 041)               | 27.3 (693) | 53 (1 346)                 | 39.3 (998) |
| CF5016         | Compression Fitting, DN50, PN16 Flange     | 24.6 (625)                 | 10.9 (277) | 41.0 (1 041)               | 27.3 (693) | 53 (1 346)                 | 39.3 (998) |
| CF8300         | Compression Fitting, 2 Inch, 300 LB Flange | 24.6 (625)                 | 10.8 (274) | 41.0 (1 041)               | 27.2 (691) | 53 (1 346)                 | 39.2 (996) |
| CF5040         | Compression Fitting, DN50, PN40 Flange     | 24.6 (625)                 | 10.8 (274) | 41.0 (1 041)               | 27.2 (691) | 53 (1 346)                 | 39.2 (996) |
| CF8600         | Compression Fitting, 2 Inch, 600 LB Flange | 24.6 (625)                 | 10.4 (264) | 41.0 (1 041)               | 26.8 (681) | 53 (1 346)                 | 38.8 (986) |
| CF5064         | Compression Fitting, DN50, PN64 Flange     | 24.6 (625)                 | 10.4 (264) | 41.0 (1 041)               | 26.8 (681) | 53 (1 346)                 | 38.8 (986) |

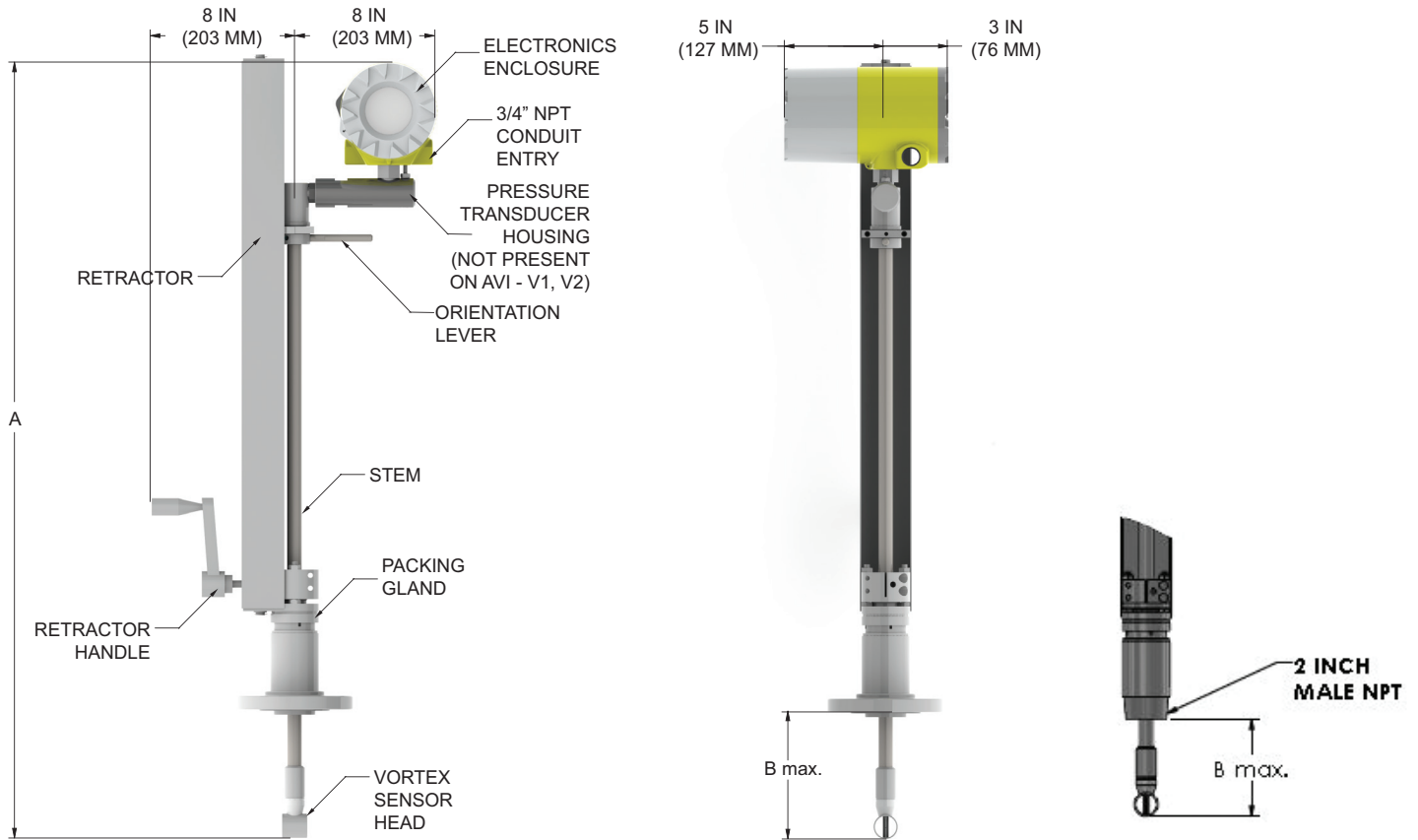
## AVI Packing Gland Models

**REMOVABLE RETRACTOR CAN BE USED WITH THESE MODELS**



| Model AVI |                                      | SL/Standard Length<br>in (mm) |            | EL/Extended Length<br>in (mm) |            |
|-----------|--------------------------------------|-------------------------------|------------|-------------------------------|------------|
|           |                                      | A                             | B          | A                             | B          |
| PT8       | Packing Gland, Male NPT              | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF8150    | Packing Gland, 2 Inch, 150 LB Flange | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF5016    | Packing Gland, DN50, PN16 Flange     | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF8300    | Packing Gland, 2 Inch, 300 LB Flange | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF5040    | Packing Gland, DN50, PN40 Flange     | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF8600    | Packing Gland, 2 Inch, 600 LB Flange | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF5064    | Packing Gland, DN50, PN64 Flange     | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |

## AVI Packing Gland Models with Permanent Retractor



| Model AVI<br>With Permanent Retractor |                                      | SL/Standard Length<br>in (mm) |            | EL/Extended Length<br>in (mm) |            |
|---------------------------------------|--------------------------------------|-------------------------------|------------|-------------------------------|------------|
|                                       |                                      | A                             | B          | A                             | B          |
| PT8R                                  | Packing Gland, Male NPT              | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF8150R                               | Packing Gland, 2 Inch, 150 LB Flange | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF5016R                               | Packing Gland, DN50, PN16 Flange     | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF8300R                               | Packing Gland, 2 Inch, 300 LB Flange | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF5040R                               | Packing Gland, DN50, PN40 Flange     | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF8600R                               | Packing Gland, 2 Inch, 600 LB Flange | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |
| PF5064R                               | Packing Gland, DN50, PN64 Flange     | 40.5 (1 029)                  | 21.5 (546) | 52.5 (1 334)                  | 33.5 (851) |



# AVI Ordering Information

| Product Code                 |   |
|------------------------------|---|
| AVI                          | Armstrong Insertion Vortex  |
| <b>Process Connections</b>   |   |
| CT8                          | Compression, 2 inch NPT   |
| CF8150                       | Compression, 2 inch 150# Flange   |
| CF5016                       | Compression, DN50 PN16 Flange   |
| CF8300                       | Compression, 2 inch 300# Flange   |
| CF5040                       | Compression, DN50 PN 40 Flange  |
| CF8600                       | Compression, 2 inch 600# Flange   |
| CF5064                       | Compression, DN50 PN64 Flange   |
| PT8                          | Packing Gland, 2 inch NPT   |
| PF8150                       | Packing Gland, 2 inch 150# Flange   |
| PF5016                       | Packing Gland, DN50 PN16 Flange   |
| PF8300                       | Packing Gland, 2 inch 300# Flange   |
| PF5040                       | Packing Gland, DN50 PN40 Flange   |
| PT8R                         | Packing Gland, 2 inch NPT, Retractor  |
| PF8150R                      | Packing Gland, 2 inch 150# Flange, Retractor  |
| PF5016R                      | Packing Gland, DN50 PN16 Flange, Retractor  |
| PF8300R                      | Packing Gland, 2 inch 300# Flange, Retractor  |
| PF5040R                      | Packing Gland, DN50 PN40 Flange, Retractor  |
| PF8600R                      | Packing Gland, 2 inch 600# Flange, Retractor  |
| PF5064R                      | Packing gland, DN50 PN64 Flange, Retractor  |
| <b>Probe Length</b>          |   |
| S                            | Standard Length   |
| C                            | Compact Length  |
| E                            | Extended Length   |
| <b>Electronics</b>           |   |
| D                            | NEMA 4X Enclosure   |
| R1                           | Remote NEMA 4X Enclosure, 50 foot cable (15 meters)   |
| R2                           | Remote NEMA 4X Enclosure, 25 foot cable (7 meters)  |
| <b>Multivariable Options</b> |   |
| V1                           | Volumetric  |
| V2                           | Velocity, Temperature   |
| V3                           | Velocity, Temperature, Pressure   |
| V4                           | Velocity, Temperature, External Pressure  |
| E1                           | Energy  |
| E2                           | Energy, Pressure  |
| <b>Input Power</b>           |   |
| LP                           | 12-36VDC, 25mA, 1W max, loop powered, output option 1 only                                      |
| DC                           | 12-36VDC, 300mA, 9W max, output options 2, 3, 4, 5, 6, 7  |
| AC                           | 10-240VAC, 5W max, output options 2, 3, 4, 5, 6, 7  |
| <b>Output</b>                |   |
| 1                            | One 4-20mA analog output, scaled frequency, one pulse, HART™, LP power only                     |
| 2                            | One 4-20mA analog output, scaled frequency, one alarm, one pulse, HART™, DC or AC power         |
| 3                            | One 4-20mA analog output, scaled frequency, one alarm, one pulse, Modbus, DC or AC power        |
| 4                            | One 4-20mA analog output, scaled frequency, one alarm, one pulse BACnet™, DC or AC power        |
| 5                            | Three 4-20mA analog outputs, scaled frequency, three alarms, one pulse, HART™, DC or AC power   |
| 6                            | Three 4-20mA analog outputs, scaled frequency, three alarms, one pulse, Modbus, DC or AC power  |
| 7                            | Three 4-20mA analog outputs, scaled frequency, three alarms, one pulse, BACnet™, DC or AC power |
| <b>Temperature Options</b>   |   |
| T                            | Standard temperature, Process temperature -330°F - 500°F (-200°C - 260°C)                       |
| H                            | High temperature, Process temperature up to 750°F (400°C)                                       |
| <b>Pressure Options</b>      |   |
| N                            | No pressure sensor  |
| 1                            | Maximum 30 psia (2 bara), Proof 60 psia (4 bara)  |
| 2                            | Maximum 100 psia (7 bara), Proof 200 psia (14 bara)   |
| 3                            | Maximum 300 psia (20 bara), Proof 600 psia (41 bara)  |
| 4                            | Maximum 500 psia (34 bara), Proof 1000 psia (64 bara)   |
| 5                            | Maximum 1500 psia (100 bara), Proof 2500 psia (175 bara)  |

AVI CF8150 S D V2 DC 2 T N

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit [armstronginternational.com/veris](http://armstronginternational.com/veris) for up-to-date information.







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