



# PanaFlow™ MV82

## Insertion style multivariable flowmeter

PanaFlow MV82 in-line multivariable mass vortex flowmeter is the next generation vortex meter. PanaFlow MV82's multivariable design consists of a vortex shedding velocity sensor, an RTD temperature sensor and a solid state pressure transducer that measures the mass flow rate of steam, gases and liquids. Other meter types use external process measurements to calculate mass flow. The temperature and pressure devices are typically not installed in the same location as the flowmeter. Process conditions can vary greatly between the two locations, causing inaccurate mass flow readings. PanaFlow MV82 measures velocity, temperature and pressure at the same location, which provides more accurate process measurement.

## Portfolio of flow meter solutions

Panametrics is committed to providing customers with the best technologies for their flow measurement needs. PanaFlow MV82 is the newest addition to the PanaFlow family of flowmeters, providing effective solutions for smaller pipe sizes for a variety of applications. Panametrics offers the PanaFlow MV82 in a number of configurations to best suit your application measurement needs.

## Field service solutions

Panametrics has a global field service team ready to assist in the start-up and commissioning of the PanaFlow MV82 flowmeters. This service includes validating the proper installation and programming of the meter, and can include customized training for theory, operation and maintenance. Regularly scheduled preventative maintenance visits will provide peace of mind, ensuring that the meters work to specification and your expectation for years.

## Mass flow measurement—true multivariable

The MV82 offers flow computer functionality in a compact field device. The VTP option incorporates temperature and pressure sensors to provide an instantaneous reading of compensated mass flow rate of gases, liquids and steam. In addition to outputs for totalized mass and alarm settings, the field configurable electronics deliver up to three analog 4–20 mA outputs of five process measurements, including volumetric flow rate, mass flow rate, pressure, temperature and density. Alternate configurations for mass flow include a temperature only compensation (VT), best used when in saturated steam applications, and an integrated RTD with an external pressure transmitter (VT-EP) when a full function pressure transmitter is desired.

## Energy measurement in liquids and steam

The VT-EM energy monitoring option enables real time-of-flight diffraction calculation of energy consumption for a facility or process. The meter can be programmed to measure steam, hot water or chilled water. This option uses the MV82 flowmeter to monitor one side of the process, either sent or return, and uses the input from a second separate temperature sensor on the opposite leg of the process to calculate the change in energy. Selectable energy units include BTU, joules, calories, watt-hours, megawatt-hours and horsepower-hours. The local or remote electronics indicate two temperatures, delta T, mass total and energy total. For energy measurement in steam, the VTP-EM option adds a pressure transmitter to offer better accuracy.

## Volumetric flow for most gases and liquids

The base model MV82 delivers a direct reading of volumetric flow rate—generally the most cost-effective solution for liquid flow monitoring—in applications ranging from general water flows to hydrocarbon fuel flow measurement.

## Key benefits

- Multivariable vortex flowmeter for measuring volumetric flow, temperature, pressure, density, and mass flow using a single meter
- Advanced design and digital signal processing for vibration isolation
- Cost effective, accurate and reliable meter for volumetric and mass flow measurement in most gases, liquids and steam without the need to recalibrate
- Energy management through accurate measurement of both temperature and mass flow simultaneously
- Remote monitoring and integration to DCS using HART®, Modbus®, and BACnet® communication protocols
- Significant cost savings through reduced installation costs, wiring runs and services support using MV meter with no moving parts.
- Certified for division 1/Zone 1 explosive atmospheres — US/ CAN/ATEX/IEC Ex

## Applications

- Ideal for high temperature and high velocity steam
- Power generation—fuel and steam applications
- Industrial—HVAC, district energy management
- Commercial—building, campus and facility energy management
- Oil and gas—allocation of natural gas
- Petrochemical—mass balancing, reaction processes heating

| Model       | Configuration  | Volumetric flow | Mass flow | Integrated RTD | Integrated pressure | External temperature | External pressure | Typical application   | Pipe size* |
|-------------|--|-----------------|-----------|----------------|---------------------|----------------------|-------------------|---|------------|
| MV82-V      | Volumetric flow for liquid and gas   | X               |           |                |                     |                      |                   | Liquid volumetric flow                                      | 2" to 72"  |
| MV82-VT     | Mass flow with temperature and assumed saturated steam   | X               | X         | X              |                     |                      |                   | Saturated steam and liquid mass flow                        | 2" to 72"  |
| MV82-VTP    | Mass flow with integrated temperature and Pressure in one device                               | X               | X         | X              | X                   |                      |                   | Steam and gases mass flow                                   | 2" to 72"  |
| MV82-VT-EP  | Mass flow with integrated temperature and analog input for an external pressure transmitter    | X               | X         | X              |                     |                      | X                 | Steam and gases mass flow (special material, high pressure) | 2" to 72"  |
| MV82-VT-EM  | Energy using integrated temperature and one input for an RTD transmitter                       | X               |           | X              |                     | X                    |                   | Saturated steam and liquid energy                           | 2" to 72"  |
| MV82-VTP-EM | Energy for steam with integrated pressure and temperature and one input for an RTD transmitter | X               | X         | X              | X                   | X                    |                   | Steam energy  | 2" to 72"  |

# Technical Specifications

## Performance

**Accuracy** Mass flow rate accuracy for gas and steam based on 50-100% of pressure range

| PanaFlow MV82 flow meter accuracy |                      |                      |
|-----------------------------------|----------------------|----------------------|
| Process variable                  | Liquids              | Gas and steam        |
| Volumetric flow rate              | ± 1.2% of rate       | ± 1.5% of rate       |
| Mass flow rate                    | ± 1.5% of rate       | ± 2% of rate         |
| Temperature                       | ± 2°F (± 1°C)        | ± 2°F (± 1°C)        |
| Pressure                          | ± 0.3% of full scale | ± 0.3% of full scale |
| Density                           | ± 0.3% of reading    | ± 0.5% of reading    |

**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

## Operating

**Process and ambient temperature**

- Process standard temperature (code ST): -40 to 500°F (-40 to 260°C)
- Process high temperature (code HT): Up to 750°F (400°C)
- Ambient operating: -5 to 185°F (-20 to 85°C)
- Ambient storage -40 to 185°F (-40 to 85°C)

| Pressure transducer ratings   |      |                          |      |
|-------------------------------|------|--------------------------|------|
| Full scale operating pressure |      | Max. over-range pressure |      |
| psia                          | bara | psia                     | bara |
| 30                            | 2    | 60                       | 4    |
| 100                           | 7    | 200                      | 14   |
| 300                           | 20   | 600                      | 40   |
| 500                           | 35   | 1000                     | 70   |
| 1500                          | 100  | 2500                     | 175  |

**Pressure ratings**

| Style connection | Process                           | Rating               | Ordering |
|------------------|-----------------------------------|----------------------|----------|
|                  | 2-inch (50mm) Male NPT            | ANSI 600 lb          | CNPT     |
|                  | 2-inch 150 lb (50mm 70kg) flange  | ANSI 150 lb -- PN 16 | C150     |
|                  | 2-inch 300 lb (50mm 135kg) flange | ANSI 300 lb -- PN 40 | C300     |
|                  | 2-inch 600 lb (50mm 275kg) flange | ANSI 600 lb -- PN 64 | C600     |

**Packing gland**

|  |                                   |                    |      |
|--|-----------------------------------|--------------------|------|
|  | 2-inch (50mm) Male NPT            | 50 psig (3.5 barg) | PNPT |
|  | 2-inch 150 lb (50mm 70kg) flange  | 50 psig (3.5 barg) | P150 |
|  | 2-inch 300 lb (50mm 135kg) flange | 50 psig (3.5 barg) | P300 |

**Packing gland and removable retractor**

|  |                                   |                     |             |
|--|-----------------------------------|---------------------|-------------|
|  | 2-inch (50mm) Male NPT            | ANSI 300 lb (135kg) | PNPT and RR |
|  | 2-inch 150 lb (50mm 70kg) flange  | ANSI 150 lb (70kg)  | P150 and RR |
|  | 2-inch 300 lb (50mm 135kg) flange | ANSI 300 lb (135kg) | P300 and RR |

**Packing gland and permanent retractor**

|  |                                   |                     |       |
|--|-----------------------------------|---------------------|-------|
|  | 2-inch (50mm) Male NPT            | ANSI 600 lb (275kg) | PNPTR |
|  | 2-inch 150 lb (50mm 70kg) flange  | ANSI 150 lb (70kg)  | P150R |
|  | 2-inch 300 lb (50mm 135kg) flange | ANSI 300 lb (135kg) | P300R |
|  | 2-inch 600 lb (50mm 275kg) flange | ANSI 600 lb (275kg) | P600R |

- Power requirements**
- Model MV82-V: 12-36 VDC loop powered
  - Model MV82-VTP, DC option: 12-36 VDC, 100 mA max
  - Model MV82-VTP, AC option: 85-240 VAC, 50/60 Hz, 1 watt
  - Model MV82-VTP, DC4POE option: 12-28 VDC or power over ethernet (5 watts maximum)

- 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

- Output signals**
- Analog: 4-20 mA, loop powered for volumetric meters
  - Alarm: Solid state relay, 40 VDC
  - Totalizer Pulse: 50 millisecond, 40 VDC
  - Volumetric: One analog, one totalizer pulse, HART
  - Multivariable: Up to three analog signals, three alarms, one totalizer pulse, HART
  - Multivariable option: HART, Modbus RTU, Modbus TCP/IP, BACnet/MSTP, BACnet TCP/IP

**Physical**

- Wetted materials** 316L stainless steel, plus:
- PTFE-based thread sealant on models with pressure transducer
  - PTFE packing on standard temperature models with packing gland
  - Graphite-based packing on high temperature models with packing gland

- Certifications**
- Explosion-proof for Class I, Division 1, Groups B, C & D
  - Dust-ignitionproof for Class II, III, Division 1, Groups E, F & G
  - Type 4x and IP66
  - T6 Temperature Class at -40°C - +70°C
  - KEMA ATEX/IEC Ex Approvals II 2 G Ex d IIB + H2 T6
  - II 2 D Ex tD A21 IP66 T85°C

**Sizing considerations**

**Piping conditions**

| Condition                                 | Pipe diameters, D |            |
|---|-------------------|------------|
|   | Upstream          | Downstream |
| One 90° elbow before meter                | 10D               | 5D         |
| Two 90° elbows before meter               | 15D               | 5D         |
| Two 90° elbows before meter, out of plane | 25D               | 5D         |
| Reduction before meter                    | 10D               | 5D         |
| Expansion before meter                    | 20D               | 5D         |
| Partially open valve                      | 25D               | 5D         |

**Velocity range**

- Maximum velocity, liquid: 30 feet/sec (9 meters/second)
- Minimum velocity, liquid: 1 foot/sec (.3 meters/second)
- Maximum velocity, gas or steam: 300 feet/sec (90 meters/second)
- Minimum velocity, gas or steam feet/sec (meters/second):

$$\frac{5}{\sqrt{\text{density (lb/ft}^3\text{)}}}$$

$$\frac{6.1}{\sqrt{\text{density (kg/m}^3\text{)}}}$$

## Consult the PanaFlow MV sizing program for easy calculation of flow range.

| Water minimum and maximum flow rates |                        |      |      |      |       |       |
|--------------------------------------|------------------------|------|------|------|-------|-------|
| Rate                                 | Nominal pipe size (in) |      |      |      |       |       |
|                                      | 3                      | 6    | 8    | 12   | 16    | 24    |
| GPM min                              | 20.6                   | 81.3 | 142  | 317  | 501   | 1138  |
| GPM max                              | 618                    | 2437 | 4270 | 9501 | 15043 | 34144 |
|                                      | Nominal pipe size (mm) |      |      |      |       |       |
|                                      | 80                     | 150  | 200  | 300  | 400   | 600   |
| M3/hr min                            | 5.2                    | 20.4 | 35.4 | 79.2 | 125   | 284   |
| M3/hr max                            | 157                    | 614  | 1062 | 2337 | 3753  | 8537  |

| Typical saturated steam minimum and maximum flow rates (lb/hr) |                        |                |                |                 |                  |                  |
|--|------------------------|----------------|----------------|-----------------|------------------|------------------|
|  | Nominal Pipe Size (in) |                |                |                 |                  |                  |
| Pressure   | 3                      | 6              | 8              | 12              | 16               | 24               |
| 5 psig   | 205<br>2721            | 800<br>10633   | 1385<br>18412  | 3099<br>41196   | 4893<br>65039    | 11132<br>147954  |
| 100 psig   | 468<br>14246           | 1831<br>55674  | 3170<br>96407  | 7092<br>215703  | 11197<br>340546  | 25472<br>774698  |
| 200 psig   | 632<br>25948           | 2471<br>101405 | 4278<br>175595 | 9572<br>392880  | 15111<br>620268  | 34377<br>1411029 |
| 300 psig   | 762<br>37652           | 2976<br>147145 | 5153<br>254799 | 11530<br>570093 | 18203<br>900047  | 41410<br>2047489 |
| 400 psig   | 873<br>49494           | 3412<br>193420 | 5908<br>334930 | 13219<br>749382 | 20870<br>1183103 | 47477<br>2691404 |
| 500 psig   | 974<br>61543           | 3805<br>240507 | 6588<br>416468 | 14741<br>931816 | 23272<br>1471125 | 52942<br>3346615 |

| Typical saturated steam minimum and maximum flow rates (kg/hr) |                        |               |                |                |                |                 |
|--|------------------------|---------------|----------------|----------------|----------------|-----------------|
|  | Nominal Pipe Size (mm) |               |                |                |                |                 |
| Pressure   | 80                     | 150           | 200            | 300            | 400            | 600             |
| 0 barg   | 81<br>938              | 316<br>3667   | 548<br>6350    | 1226<br>14209  | 1936<br>22432  | 4404<br>51039   |
| 5 barg   | 187<br>4946            | 729<br>19486  | 1263<br>33742  | 2826<br>75495  | 4461<br>119189 | 10151<br>271187 |
| 10 barg  | 249<br>8859            | 972<br>34620  | 1683<br>59949  | 3767<br>134132 | 5947<br>211764 | 13530<br>481821 |
| 15 barg  | 298<br>12700           | 1164<br>49629 | 2016<br>85939  | 4510<br>192283 | 7120<br>303570 | 16200<br>690705 |
| 20 barg  | 340<br>16550           | 1329<br>64676 | 2301<br>111995 | 5148<br>250581 | 8128<br>395609 | 18493<br>900119 |
| 30 barg  | 413<br>24357           | 1612<br>95187 | 2791<br>164827 | 6246<br>368789 | 9860<br>582234 | 22435<br>582234 |

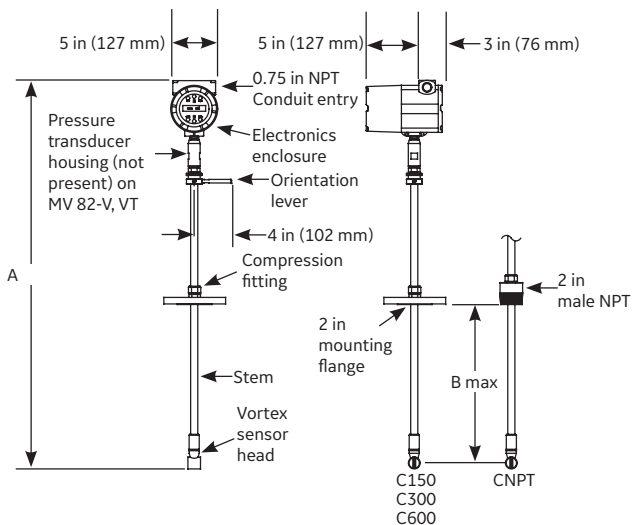
| Typical air minimum and maximum flow rates (SCFM) air at 70°F |                        |                |                |                |                |                  |
|---|------------------------|----------------|----------------|----------------|----------------|------------------|
|   | Nominal pipe size (in) |                |                |                |                |                  |
| Pressure  | 3                      | 6              | 8              | 12             | 16             | 24               |
| 0 psig  | 56<br>924              | 220<br>3611    | 381<br>6253    | 852<br>13991   | 1345<br>22089  | 3059<br>50250    |
| 100 psig  | 157<br>7236            | 615<br>28279   | 1065<br>48969  | 2383<br>109564 | 3763<br>172977 | 8560<br>393500   |
| 200 psig  | 216<br>13588           | 843<br>53101   | 1460<br>91950  | 3266<br>205732 | 5156<br>324804 | 11729<br>738886  |
| 300 psig  | 262<br>19974           | 1022<br>78059  | 1770<br>135169 | 3960<br>302430 | 6251<br>477467 | 14221<br>1086176 |
| 400 psig  | 301<br>26391           | 1175<br>103136 | 2034<br>178593 | 4551<br>399588 | 7186<br>630859 | 16346<br>1435121 |
| 500 psig  | 335<br>32834           | 1310<br>128314 | 2269<br>222191 | 5077<br>497136 | 8015<br>784865 | 18233<br>1785464 |

| Typical air minimum and maximum flow rates (nm³/hr) air at 20°C |                        |                |                |                |                  |                  |
|---|------------------------|----------------|----------------|----------------|------------------|------------------|
|   | Nominal Pipe Size (mm) |                |                |                |                  |                  |
| Pressure  | 80                     | 150            | 200            | 300            | 400              | 600              |
| 0 barg  | 89<br>1463             | 347<br>5716    | 601<br>9897    | 1345<br>22145  | 2124<br>34962    | 4833<br>79547    |
| 5 barg  | 217<br>8702            | 847<br>34006   | 1467<br>58885  | 3282<br>131751 | 5181<br>208004   | 11788<br>473266  |
| 10 barg   | 294<br>15975           | 1148<br>62430  | 1987<br>108105 | 4446<br>241878 | 7020<br>381870   | 15972<br>868857  |
| 15 barg   | 355<br>23280           | 1385<br>90979  | 2399<br>157542 | 5368<br>352487 | 8474<br>556497   | 19282<br>1266182 |
| 20 barg   | 407<br>30615           | 1589<br>119642 | 2751<br>207175 | 6156<br>463539 | 9718<br>731823   | 22112<br>1665095 |
| 30 barg   | 495<br>45361           | 1934<br>177268 | 3349<br>306961 | 7493<br>686081 | 11829<br>1084302 | 26915<br>2467081 |

## Turndown

Turndown is application-dependent. Consult the PanaFlow MV sizing program for exact values. Turndown can exceed 100:1.

## Dimensional outline: compression fitting models



| Approximate weight, lb (kg) |          |          |          |
|-----------------------------|----------|----------|----------|
|                             | CL       | SL       | EL       |
| CNPT                        | 13 (5.7) | 14 (6.2) | 15 (6.7) |
| C150                        | 15 (6.8) | 16 (7.3) | 17 (7.8) |
| C300                        | 17 (7.8) | 18 (8.3) | 19 (8.8) |
| C600                        | 18 (8.2) | 19 (8.0) | 20 (9.2) |

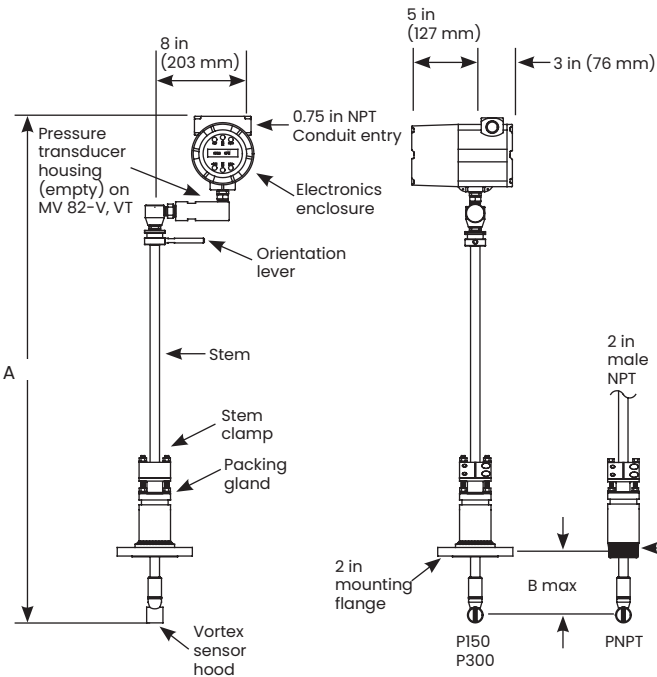
Add 11 lb (5 kg) for remote electronics

| PanaFlow MV82-V, VT in (mm)              | CL/Compact Length |            | SL/Standard Length |            | EL/Extended Length |            |
|--|-------------------|------------|--------------------|------------|--------------------|------------|
|  | A                 | B          | A                  | B          | A                  | B          |
| CNPT, compression fitting, male NPT      | 21.6 (549)        | 9.8 (249)  | 38 (965)           | 26.2 (665) | 50 (1270)          | 38.2 (970) |
| C150, compression fitting, 150 lb flange | 21.6 (549)        | 10.9 (277) | 38 (965)           | 27.3 (693) | 50 (1270)          | 39.3 (998) |
| C300, compression fitting, 300 lb flange | 21.6 (549)        | 10.8 (277) | 38 (965)           | 27.2 (691) | 50 (1270)          | 39.2 (996) |
| C600, compression fitting, 600 lb flange | 21.6 (549)        | 10.4 (264) | 38 (965)           | 26.8 (681) | 50 (1270)          | 38.8 (986) |

| PanaFlow MV82-VTP in (mm)                | CL/Compact Length |            | SL/Standard Length |            | EL/Extended Length |            |
|--|-------------------|------------|--------------------|------------|--------------------|------------|
|  | A                 | B          | A                  | B          | A                  | B          |
| CNPT, compression fitting, male NPT      | 24.6 (625)        | 9.8 (249)  | 41 (1041)          | 26.2 (665) | 53 (1346)          | 38.2 (970) |
| C150, compression fitting, 150 lb flange | 24.6 (625)        | 10.9 (277) | 41 (1041)          | 27.3 (693) | 53 (1346)          | 39.3 (998) |
| C300, compression fitting, 300 lb flange | 24.6 (625)        | 10.8 (274) | 41 (1041)          | 27.2 (691) | 53 (1346)          | 39.2 (996) |
| C600, compression fitting, 600 lb flange | 24.6 (625)        | 10.4 (264) | 41 (1041)          | 26.8 (681) | 53 (1346)          | 38.8 (986) |

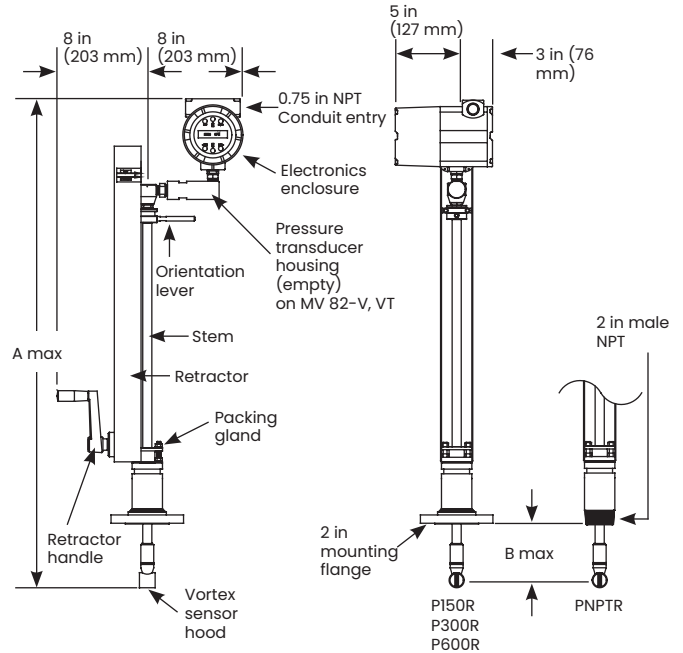
### Dimensional outline: packing gland models

Removable retractor can be used with these models



| PanaFlow MV82 in (mm)              | SL/Compact Length |            | EL/Standard Length |            |
|------------------------------------|-------------------|------------|--------------------|------------|
|                                    | A                 | B          | A                  | B          |
| PNPT, packing gland, male NPT      | 40.5 (1029)       | 21.5 (546) | 52.5 (1334)        | 33.5 (851) |
| P150, packing gland, 150 lb flange | 40.5 (1029)       | 21.1 (536) | 52.5 (1334)        | 33.1 (841) |
| P300, packing gland, 300 lb flange | 40.5 (1029)       | 21.1 (536) | 52.5 (1334)        | 33.1 (841) |

### Dimensional outline: packing gland models with permanent retractor



| PanaFlow MV82 in (mm) with permanent retractor | SL/Standard Length |            | EL/Extended Length |            |
|--|--------------------|------------|--------------------|------------|
|  | A                  | B          | A                  | B          |
| PNPT, packing gland, male NPT                  | 40.5 (1029)        | 21.5 (546) | 52.5 (1334)        | 33.5 (851) |
| P150R, packing gland, 150 lb flange            | 40.5 (1029)        | 21.1 (536) | 52.5 (1334)        | 33.5 (841) |
| P300R, packing gland, 300 lb flange            | 40.5 (1029)        | 21.1 (536) | 52.5 (1334)        | 33.1 (841) |
| P600R, packing gland, 600 lb flange            | 40.5 (1029)        | 21.1 (536) | 52.5 (1334)        | 33.1 (841) |

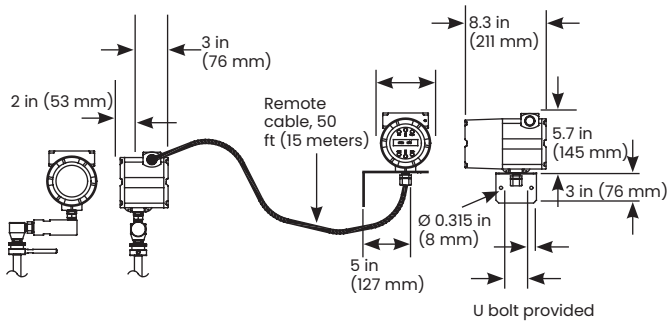
| Approximate weight, lb (kg) |           |           |
|-----------------------------|-----------|-----------|
|                             | SL        | EL        |
| PNPT                        | 16 (7.1)  | 17 (7.6)  |
| P150                        | 21 (9.4)  | 22 (9.9)  |
| P300                        | 25 (11.3) | 26 (11.8) |

Add 11 lb (5 kg) for remote electronics

| Approximate weight, lb (kg) |           |           |
|-----------------------------|-----------|-----------|
|                             | SL        | EL        |
| PNPT                        | 25 (11.5) | 32 (14.5) |
| P150                        | 30 (13.7) | 37 (16.7) |
| P300                        | 34 (15.5) | 41 (18.5) |

Add 11 lb (5 kg) for remote electronics

### Dimensional outline: remote electronics option



Remote electronics option available on all modes

## PanaFlow MV82 ordering information

### Parent number code

**MV82** Insertion multivariable mass Vortex flowmeter

#### Feature 1: Multivariable options

- V** Volumetric flowmeter for liquid, gas and steam
- VT** Velocity and temperature sensors
- VTP** Velocity, temperature and pressure sensors
- VT-EM** Energy output options
- VTP-EM** Energy options with pressure sensor
- VT-EP** Velocity and temperature sensors with analog input for pressure
- VTEP-EM** Energy option with external pressure sensor

#### Feature 2: Probe length

- SL** Standard length
- CL** Compact length
- EL** Extended length

#### Feature 3: Electronics enclosure

- L** Local electronics Type 4X enclosure mounted on probe
- R (25)** Remote electronics Type 4X, 25 ft (8 m) cable
- R (50)** Remote electronics Type 4X, 50 ft (17 m) cable

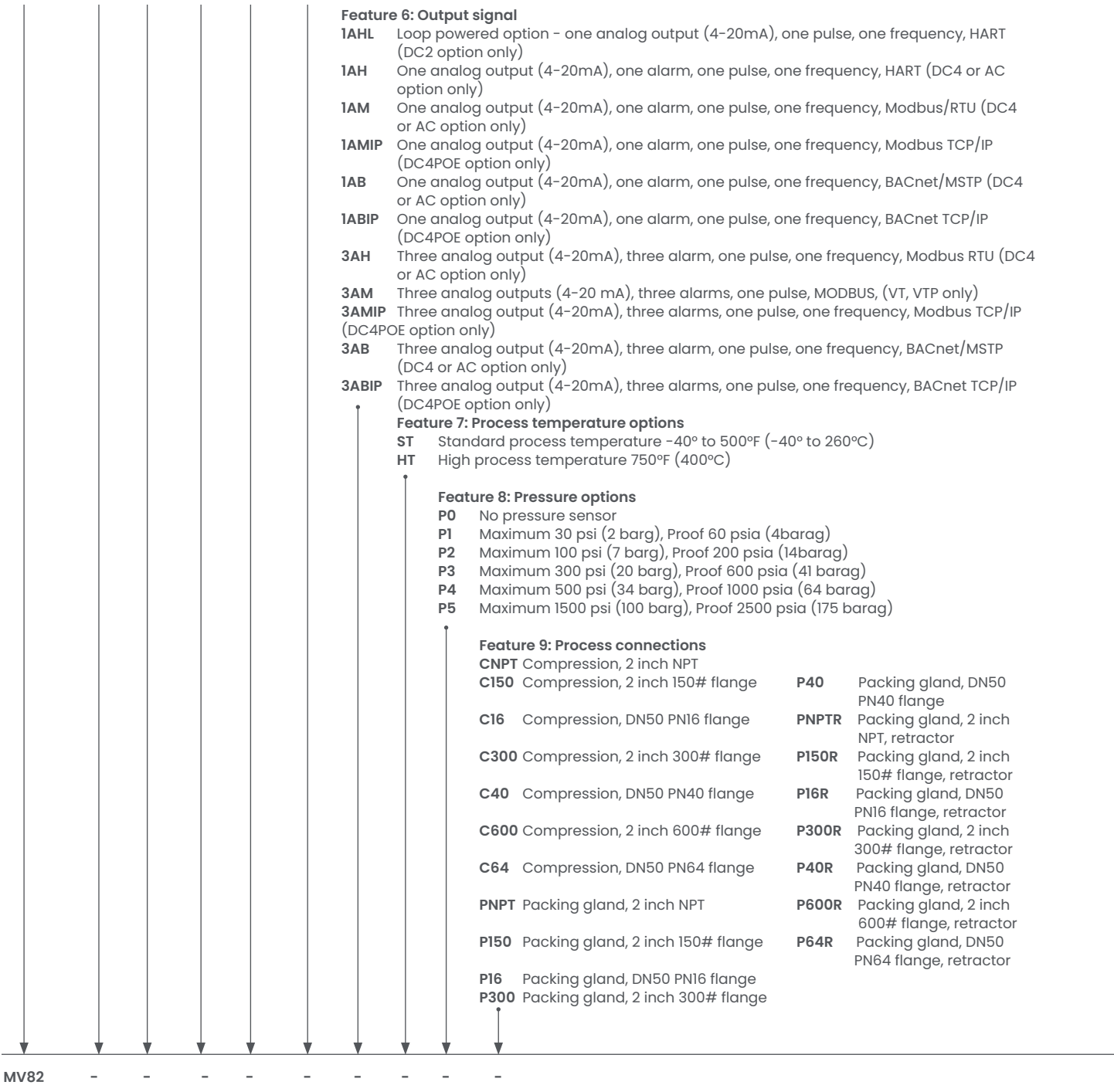
#### Feature 4: Display options

- DD** Digital display and programming buttons
- ND** No display

#### Feature 5: Input power

- DC2** 12 to 36 VDC required on 2-wire (loop powered) meters with 1AHL only
- DC4** 12 to 36 VDC standard volumetric meter on 4-wire
- AC** 100-240 VAC, 50/60 Hz
- DC4POE** 12-28 VDC or Power over Ethernet (5 Watts maximum), Requires TCP/IP option

(continued on next page)



**Feature 6: Output signal**

- 1AHL** Loop powered option - one analog output (4-20mA), one pulse, one frequency, HART (DC2 option only)
- 1AH** One analog output (4-20mA), one alarm, one pulse, one frequency, HART (DC4 or AC option only)
- 1AM** One analog output (4-20mA), one alarm, one pulse, one frequency, Modbus/RTU (DC4 or AC option only)
- 1AMIP** One analog output (4-20mA), one alarm, one pulse, one frequency, Modbus TCP/IP (DC4POE option only)
- 1AB** One analog output (4-20mA), one alarm, one pulse, one frequency, BACnet/MSTP (DC4 or AC option only)
- 1ABIP** One analog output (4-20mA), one alarm, one pulse, one frequency, BACnet TCP/IP (DC4POE option only)
- 3AH** Three analog output (4-20mA), three alarm, one pulse, one frequency, Modbus RTU (DC4 or AC option only)
- 3AM** Three analog outputs (4-20 mA), three alarms, one pulse, MODBUS, (VT, VTP only)
- 3AMIP** Three analog output (4-20mA), three alarms, one pulse, one frequency, Modbus TCP/IP (DC4POE option only)
- 3AB** Three analog output (4-20mA), three alarm, one pulse, one frequency, BACnet/MSTP (DC4 or AC option only)
- 3ABIP** Three analog output (4-20mA), three alarms, one pulse, one frequency, BACnet TCP/IP (DC4POE option only)

**Feature 7: Process temperature options**

- ST** Standard process temperature -40° to 500°F (-40° to 260°C)
- HT** High process temperature 750°F (400°C)

**Feature 8: Pressure options**

- P0** No pressure sensor
- P1** Maximum 30 psi (2 barg), Proof 60 psia (4barag)
- P2** Maximum 100 psi (7 barg), Proof 200 psia (14barag)
- P3** Maximum 300 psi (20 barg), Proof 600 psia (41 barag)
- P4** Maximum 500 psi (34 barg), Proof 1000 psia (64 barag)
- P5** Maximum 1500 psi (100 barg), Proof 2500 psia (175 barag)

**Feature 9: Process connections**

- |   |   |
|---|---|
| <b>CNPT</b> Compression, 2 inch NPT           | <b>P40</b> Packing gland, DN50 PN40 flange                |
| <b>C150</b> Compression, 2 inch 150# flange   | <b>PNPTR</b> Packing gland, 2 inch NPT, retractor         |
| <b>C16</b> Compression, DN50 PN16 flange      | <b>P150R</b> Packing gland, 2 inch 150# flange, retractor |
| <b>C300</b> Compression, 2 inch 300# flange   | <b>P16R</b> Packing gland, DN50 PN16 flange, retractor    |
| <b>C40</b> Compression, DN50 PN40 flange      | <b>P300R</b> Packing gland, 2 inch 300# flange, retractor |
| <b>C600</b> Compression, 2 inch 600# flange   | <b>P40R</b> Packing gland, DN50 PN40 flange, retractor    |
| <b>C64</b> Compression, DN50 PN64 flange      | <b>P600R</b> Packing gland, 2 inch 600# flange, retractor |
| <b>PNPT</b> Packing gland, 2 inch NPT         | <b>P64R</b> Packing gland, DN50 PN64 flange, retractor    |
| <b>P150</b> Packing gland, 2 inch 150# flange |   |
| <b>P16</b> Packing gland, DN50 PN16 flange    |   |
| <b>P300</b> Packing gland, 2 inch 300# flange |   |

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