

## RHM08

### Versatile Coriolis Mass Flow Meter

#### Features

- Standard pressure ratings up to 1254 bar (18188 psi)
- Temperature ratings from -196 to 350°C (-320 to 662°F)
- Mass flow uncertainty down to 0.10%
- Repeatability better than 0.05%
- Typical measuring ranges between 0.5 and 50 kg/min
- Accurately measure low flow rates down to 300 g/min
- Unique robust torsion driven oscillation system
- Process connection customization available
- Minimum footprint versions available
- Approved for use in hazardous areas
- Stainless steel case
- Removable connection manifold version available for easy and efficient maintenance
- Remote and compact transmitter versions available

#### Applications

Typical applications include:

- General Flow Control
- High Pressure Gas Dispensing
- Additive Dosing
- Mixing and Batching
- Chemical Injection
- Package and Container Filling

#### Benefits

- Torsion oscillator design assures a stable and drift free measurement with excellent signal to noise ratios
- Resilient to external noise and vibration
- Insensitive to pipe pressure changes
- Robust tube wall thickness provides increased operational safety in abrasive applications
- Long sensor life guaranteed due to low mechanical stresses in the meter mechanism
- No moving parts to wear or fail

## RHM08 General Specifications

|                                      |   |
|--------------------------------------|---|
| <b>Nominal Max Flow Range:</b>       | Parallel/dual path measurement tube versions: 50 kg/min (110.2 lb/min)<br>Serial/single path measurement tube versions: 25 kg/min (55.1 lb/min)   |
| <b>Temperature Range:</b>            | 5 temperature range options cover temperatures from -196°C to 350°C (-320°F to 662°F)   |
| <b>Pressure Ratings:</b>             | Dependent upon material   |
| <b>Electrical Connection:</b>        | Cable entry M25 x 1.5 (standard) M20 x 1.5, ½" NPT, ¾" NPT (optional)<br>Max cable length to remote RHE transmitter 100m (330 ft)   |
| <b>Sensor Housing Materials:</b>     | 1.4301 / 304 stainless steel (standard), 1.4571 / 316Ti stainless steel (optional)<br>Epoxy coated aluminium electrical box (standard), 1.4571 / 316Ti stainless steel (optional)   |
| <b>Enclosure Type:</b>               | Protection class IP 65. IP 66 / NEMA 4X (optional)  |
| <b>Material of Wetted Parts:</b>     | Sensors are available in a variety of standard and custom materials to suit a wide range of pressure ratings and chemical compatibility requirements. See the pressure ratings listing in this document for further details   |
| <b>Finishes:</b>                     | ANSI flange finish: AARH 125 to 250 µin, Ra 3.2 to 6.3 µm   |
| <b>Certifications and Approvals:</b> | ATEX approval Zone 0: Ex II 1 G Ex ia IIC T1-T6 Ga<br>ATEX rating Zone 2: Ex II 3 G Ex nA IIC T1-T6 Gc<br>CSA USA-Canada, Class I, Div. 1, Groups A, B, C, D<br>PED according to 97/23/EC Art.3 (3) Sound Engineering Practice (SEP)  |
| <b>Documentation:</b>                | All sensors are supplied with a traceable calibration certificate. Optional documentation items available:<br>- Traceable material certificates<br>- Certificates of origin and conformity<br>- Welding<br>- NACE<br>- Quality<br>- Production and manufacturing procedures<br>Other documentation to client requirements available |
| <b>Proof Testing:</b>                | Hydrotest, dye penetrant, x-ray, PMI  |
| <b>Options:</b>                      | Enclosure heating matrix for high temperature applications  |

## Transmitter Range



Any Rheonik Mass Flow Transmitter model can be combined with an RHM08 sensor to provide an overall mass flow measurement system to suit any requirement. Rheonik Coriolis transmitters are available in versions specifically designed for process, industrial and OEM applications. Together they offer a tremendous range of options for system designers and end users alike.

## RHM08 Measurement Performance

| Standard Calibration |        |                 |
|----------------------|--------|-----------------|
| Flow Rate            |        | Uncertainty     |
| kg/min               | lb/min | in % of reading |
| 50*                  | 110    | 0.20            |
| 20                   | 44     | 0.20            |
| 10                   | 22     | 0.20            |
| 2.5                  | 5.5    | 0.20            |
| 1.0                  | 2.2    | 0.50            |

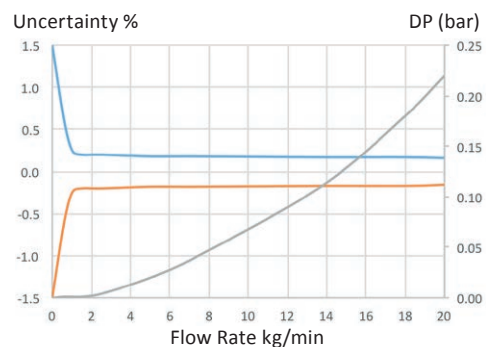
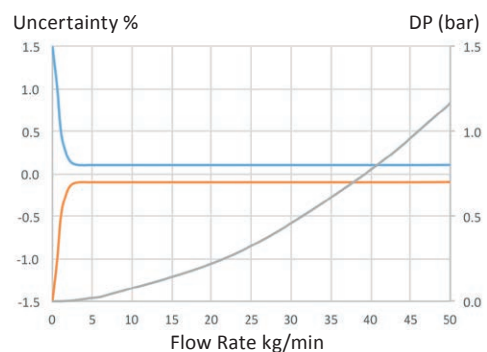
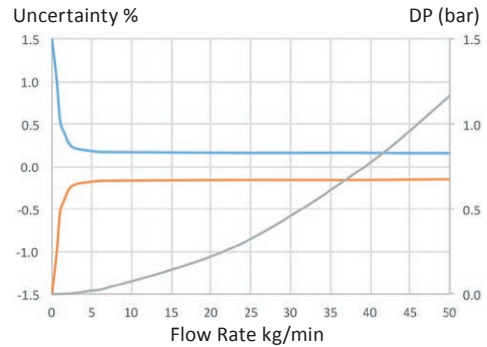
| Goldline Calibration** |        |                 |
|------------------------|--------|-----------------|
| Flow Rate              |        | Uncertainty     |
| kg/min                 | lb/min | in % of reading |
| 50*                    | 110    | 0.10            |
| 20                     | 44     | 0.10            |
| 10                     | 22     | 0.10            |
| 5.0                    | 11     | 0.10            |
| 2.5                    | 5.5    | 0.12            |

| Low Flow Calibration** |        |                 |
|------------------------|--------|-----------------|
| Flow Rate              |        | Uncertainty     |
| kg/min                 | lb/min | in % of reading |
| 20                     | 44     | 0.20            |
| 10                     | 22     | 0.20            |
| 5.0                    | 11     | 0.20            |
| 1.0                    | 2.2    | 0.20            |
| 0.6                    | 1.3    | 0.60            |

\*For PH0 and PHH construction types, the upper calibration limit is 25 kg/min.  
 \*\*Goldline and Low Flow Calibration is not available with all configurations of the RHM08. Please check with factory.

| Mass Flow Calibration Options |  |
|-------------------------------|--|
| A                             | 50:1 Standard Calibration – 0.5% Uncertainty between 50 and 1 kg/min                           |
| B                             | 20:1 Standard Calibration – 0.2% Uncertainty between 50 and 2.5 kg/min                         |
| C                             | 1:20 Calibration – 0.2% Uncertainty between 1 and 20 kg/min                                    |
| G                             | 20:1 Goldline Calibration – 0.12% Uncertainty between 50 and 2.5 kg/min                        |
| P                             | 10:1 Goldline Calibration – 0.10% Uncertainty between 50 and 5 kg/min                          |
| 1                             | Low Flow Calibration – 0.2% Uncertainty between 1 and 20 kg/min, 0.6% between 0.6 and 1 kg/min |

**Flow Measurement Repeatability**    **Temperature**  
 Standard ± 0.1% of rate                      Better than ± 1°C  
 Goldline ± 0.05% of rate



- Uncertainty of reading (incl. zero drift) stated at reference condition of: H<sub>2</sub>O, 18-24°C (66-76°F), 1-3 bar (15-45 psi) when installed according to field manual
- Pressure drop indications are based upon H<sub>2</sub>O flowing in a meter with P0 pressure rating and PM0 (parallel measuring loops with manifold block) construction
- Serial path versions offer the same accuracy performance at half the flow (Nominal max. flow range of serial versions = 25 kg/min). Pressure drop will be greater
- For customized calibration range and/or uncertainty levels, please consult factory

## RHM08 Pressure Ratings

The maximum pressure ( $P_{max}$ ) of a sensor is determined by its lowest rated part. The lowest rated part can be either the measuring tube ( $P_{max}$  indicated below), the construction type ( $P_{max}$  indicated in the Part Number Code section, last page) or the process connection (for  $P_{max}$  see published standards or manufacturer information).

## RHM08 Measurement Tube Pressure Ratings

| Pressure Code             | Material Code | Material                            | $P_{max}$ |       |   |     |     |
|---------------------------|---------------|-------------------------------------|-----------|-------|---|-----|-----|
|                           |               |                                     | bar       | psi   | @ | °C  | °F  |
| P0<br>(low pressure drop) | M1 (std.)     | 1.4571 (316Ti)<br>UNS S31635        | 142       | 2060  | @ | 50  | 122 |
|                           |               |                                     | 127       | 1842  | @ | 120 | 248 |
|                           |               |                                     | 110       | 1595  | @ | 210 | 410 |
|                           |               |                                     | 93        | 1349  | @ | 350 | 662 |
| P1 (std.)                 | M1 (std.)     | 1.4571 (316Ti)<br>UNS S31635        | 301       | 4366  | @ | 50  | 122 |
|                           |               |                                     | 269       | 3902  | @ | 120 | 248 |
|                           |               |                                     | 233       | 3379  | @ | 210 | 410 |
|                           |               |                                     | 196       | 2843  | @ | 350 | 662 |
| P1                        | M3***         | 2.4602 (Alloy C22)<br>UNS N06022    | 416       | 6034  | @ | 50  | 122 |
|                           |               |                                     | 367       | 5323  | @ | 120 | 248 |
|                           |               |                                     | 313       | 4540  | @ | 210 | 410 |
|                           |               |                                     | 261       | 3785  | @ | 350 | 662 |
| P1                        | M4**          | Tantalum<br>UNS R05200              | 156       | 2262  | @ | 50  | 122 |
|                           |               |                                     | 120       | 1740  | @ | 120 | 248 |
|                           |               |                                     | 97        | 1407  | @ | 210 | 410 |
| P1                        | 10**          | 1.4410 (Super Duplex)<br>UNS S32750 | 720       | 10443 | @ | 50  | 122 |
|                           |               |                                     | 631       | 9152  | @ | 120 | 248 |
|                           |               |                                     | 570       | 8267  | @ | 210 | 410 |
| P1                        | 62**          | 1.4462 (Duplex)<br>UNS S31803       | 575       | 8340  | @ | 50  | 122 |
|                           |               |                                     | 503       | 7295  | @ | 120 | 248 |
|                           |               |                                     | 441       | 6396  | @ | 210 | 410 |
| P2                        | 10***         | 1.4410 (Super Duplex)<br>UNS S32750 | 1254      | 18188 | @ | 50  | 122 |
|                           |               |                                     | 1100      | 15954 | @ | 120 | 248 |
|                           |               |                                     | 994       | 14417 | @ | 210 | 410 |
| P2                        | 62***         | 1.4462 (Duplex)<br>UNS S31803       | 1002      | 14533 | @ | 50  | 122 |
|                           |               |                                     | 877       | 12720 | @ | 120 | 248 |
|                           |               |                                     | 768       | 11139 | @ | 210 | 410 |
| PH                        | HP*           | Sandvik HP160                       | 1067      | 15476 | @ | 20  | 68  |
|                           |               |                                     | 900       | 13053 | @ | 50  | 122 |
|                           |               |                                     | 870       | 12618 | @ | 120 | 248 |

\*Only with construction types PH0, PHH. \*\*Only with T1, TA, T2 temperature range (note max. operating temp. is 150°C) and PF0 construction type (max. ANSI 600/PN100). \*\*\*Only with T1, TA, T2 temperature range (note min. temp. is -40°C) and PF0 construction type. \*\*\*\*Only with seal-less construction types.

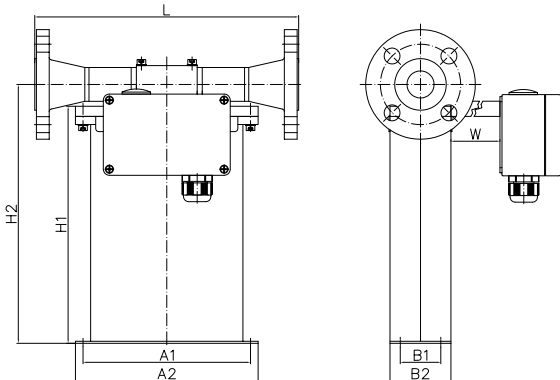
## Other Materials

Additional/custom wetted materials (Inconel, Monel, 304 stainless steel, others) may be possible for chemical compatibility, lower pressure drop, abrasion allowance, other application specific requirements.

Contact factory with specification for assessment and availability.

## RHM08 Mechanical Construction

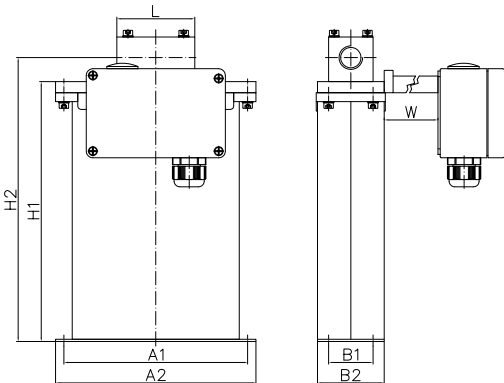
**PM0/SM0:** Serial or parallel measuring tubes with flange connection and removable manifold with PTFE seals



H2 = 255 mm (10.04 in)

| Process Connection  | Face to face length (L) |       | Order Code |
|---------------------|-------------------------|-------|------------|
|                     | mm                      | in    |            |
| ANSI 1" 150# RF     | 260                     | 10.24 | A1         |
| ANSI 1" 300# RF     | 260                     | 10.24 | A2         |
| ANSI 1" 600# RF     | 300                     | 11.81 | A3         |
| ANSI 1" 1500# RF    | 350                     | 13.78 | A6         |
| ANSI 1" 1500# RTJ   | 350                     | 13.78 | R1         |
| DIN DN25/PN40       | 260                     | 10.24 | D1         |
| DIN DN25/PN100      | 300                     | 11.81 | D2         |
| DIN DN25/PN16       | 260                     | 10.24 | D0         |
| DIN DN25/PN160      | 300                     | 11.81 | D3         |
| JIS RF 10k 25A (1") | 260                     | 10.24 | J1         |
| JIS RF 20k 25A (1") | 260                     | 10.24 | J2         |

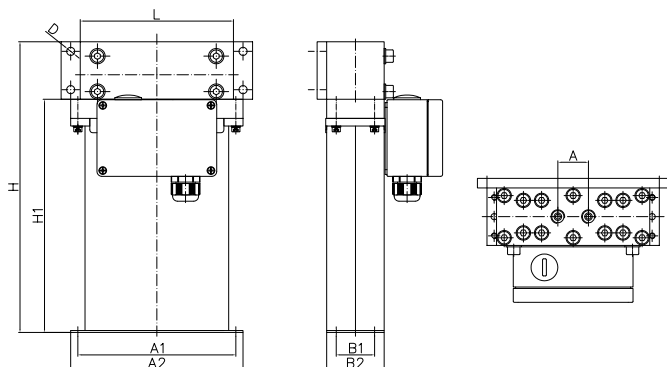
**PM0/SM0 / PH0:** Serial or parallel measuring tubes with female thread connection and removable manifold with PTFE seals



PM0/SM0                      PH0  
H1 = 234 mm (9.21 in)    H1 = 244 mm (9.61 in)  
H2 = 255 mm (10.04 in)   H2 = 264 mm (10.39 in)

| Process Connection                                 | Face to face length (L) |      | Order Code |
|--|-------------------------|------|------------|
|  | mm                      | in   |            |
| <b>PM0/SM0</b>                                     |                         |      |            |
| Female Thread G 2"                                 | 70                      | 2.76 | G1         |
| Female Thread 2" NPT                               | 70                      | 2.76 | N1         |
| <b>PH0</b>   |                         |      |            |
| Female Thread G 2"                                 | 120                     | 4.72 | G1         |
| Female Thread 2" NPT                               | 120                     | 4.72 | N1         |
| Autoclave 3/16" MP<br>(3/16"-16 UNF female thread) | 120                     | 4.72 | P1         |
| Autoclave 3/8" MP<br>(3/8"-18 UNF female thread)   | 120                     | 4.72 | P2         |

**PHH:** Parallel measuring tubes with autoclave connection and removable manifold with PTFE seals



H1 = 244 mm (9.61 in)  
A = 32 mm (1.26 in)  
D = 6.5 mm (0.26 in)  
L = 160 mm (6.30 in)

| Process Connection   | Face to face length (L) |       | Order Code |
|--|-------------------------|-------|------------|
|  | mm                      | in    |            |
| Autoclave 3/8" MP (3/8"-18 UNF female thread) – vertical/top entry | 304                     | 11.97 | P2         |

The sensor is manufactured with two internal measurement tubes arranged side by side. In parallel or dual path sensors, these tubes are connected in parallel and the flowing fluid is split equally between them. In serial or single path sensors, the tubes are connected end to end creating a single path through which all fluid flows. For customization of face to face length and/or special fittings other than the ones listed on this page, please consult factory. Note that larger diameter flange process connections are always possible.

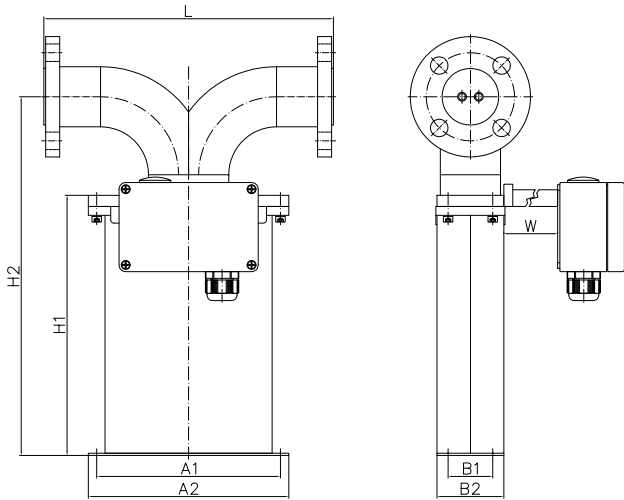
### Common Dimensions

A1 = 165 mm (6.50 in)    A2 = 180 mm (7.09 in)    B1 = 40 mm (1.57 in)    B2 = 60mm (2.36 in)    H1 = 234 mm (9.21 in)    H2 = 255 mm (10.04 in)  
W: temp. range T1, TA = 0 mm (0 in), temp. range T2 = 150 mm (5.91 in)  
Electrical box: std. = 125 x 80 x 58 mm (4.92 x 3.15 x 2.28 in), RHE16 compact = 120 x 120 x 80 mm (4.72 x 4.72 x 3.15 in)

For weights and packaging dimensions please see last page of the Mechanical Construction section.

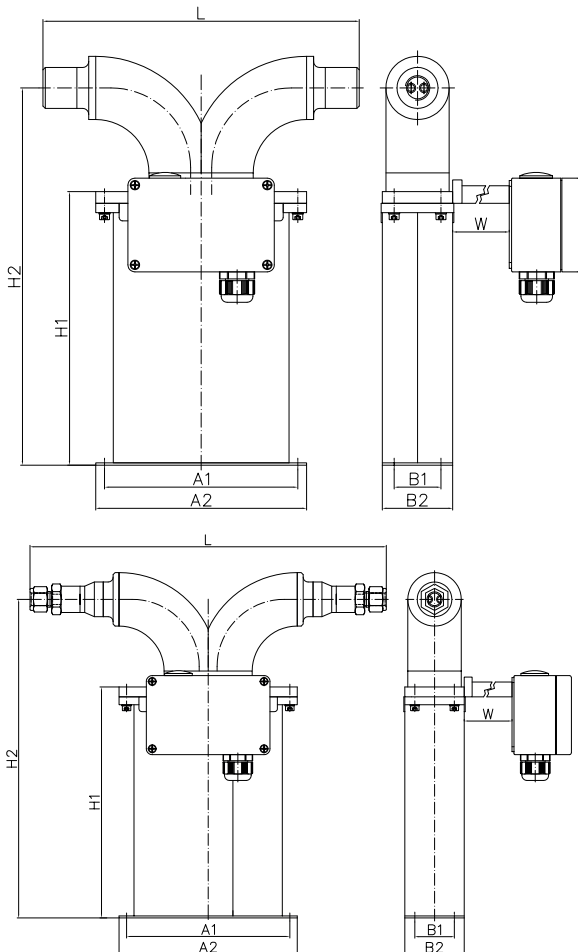
## RHM08 Mechanical Construction

**PFO:** Seal-less parallel measuring tube construction with flange connections



| Process Connection  | Face to face length (L) |       | Order Code |
|---------------------|-------------------------|-------|------------|
|                     | mm                      | in    |            |
| ANSI 1" 150# RF     | 260                     | 10.24 | A1         |
| ANSI 1" 300# RF     | 260                     | 10.24 | A2         |
| ANSI 1" 600# RF     | 300                     | 11.81 | A3         |
| ANSI 1" 1500# RF    | 300                     | 11.81 | A6         |
| ANSI 1" 2500# RF    | 300                     | 11.81 | A8         |
| ANSI 1" 1500# RTJ   | 300                     | 11.81 | R1         |
| ANSI 1" 2500# RTJ   | 300                     | 11.81 | R2         |
| DIN DN25/PN16       | 260                     | 10.24 | D0         |
| DIN DN25/PN40       | 260                     | 10.24 | D1         |
| DIN DN25/PN100      | 300                     | 11.81 | D2         |
| DIN DN25/PN160      | 300                     | 11.81 | D3         |
| JIS RF 10k 25A (1") | 260                     | 10.24 | J1         |
| JIS RF 20k 25A (1") | 260                     | 10.24 | J2         |
| Grayloc 1" GR 5 Hub | 300                     | 11.81 | H1         |
| Grayloc 1" GR 7 Hub | 300                     | 11.81 | H5         |

**PFT:** Seal-less parallel measuring tube construction with thread and compression fitting connections



| Process Connection                                  | Face to face length (L) |       | Order Code |
|---|-------------------------|-------|------------|
|   | mm                      | in    |            |
| Female Thread G 2"                                  | 270                     | 10.63 | G1         |
| Female Thread 2" NPT                                | 270                     | 10.63 | N1         |
| Swagelok ½" tube compression fitting (SS-810-1-12W) | 360                     | 14.17 | W1         |

The sensor is manufactured with two internal measurement tubes arranged side by side. In parallel or dual path sensors, these tubes are connected in parallel and the flowing fluid is split equally between them. For customization of face length and/or special fittings other than the ones listed on this page, please consult factory.  
*Note that larger diameter flange process connections are always possible.*

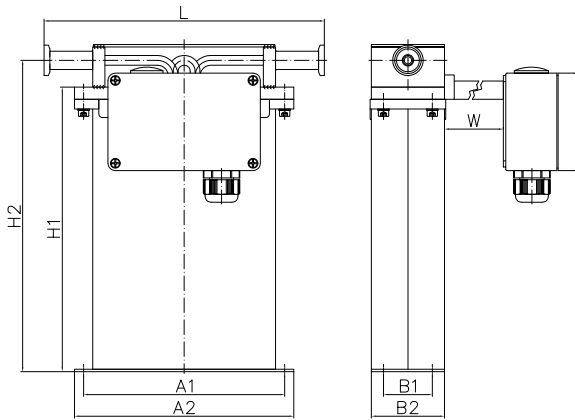
### Common Dimensions

A1 = 165 mm (6.50 in)    A2 = 180 mm (7.09 in)    B1 = 40 mm (1.57 in)    B2 = 60 mm (2.36 in)    H1 = 234 mm (9.21 in)    H2 = 322 mm (12.68 in)  
 W: temp. range T1, TA = 0 mm (0 in), temp. range T2, T3, T4 = 150 mm (5.91 in)  
 Electrical box: std. = 125 x 80 x 58 mm (4.92 x 3.15 x 2.28 in), RHE16 compact = 120 x 120 x 80 mm (4.72 x 4.72 x 3.15 in)

For weights and packaging dimensions please see last page of the Mechanical Construction section.

## RHM08 Mechanical Construction

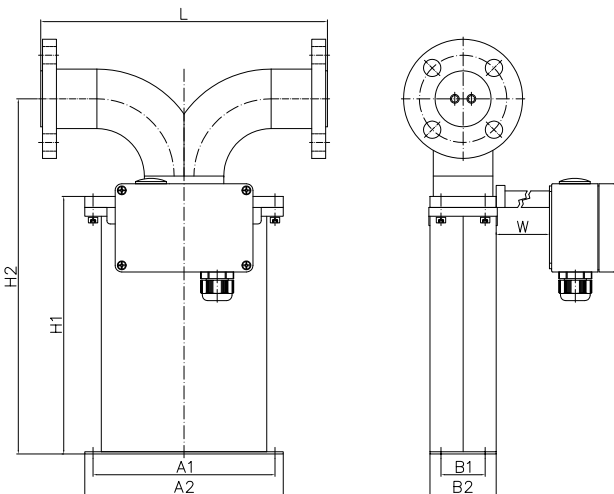
**SFO:** Seal-less serial measuring tube construction with sanitary connections\*



H2 = 256 mm (10.08 in)

| Process Connection              | Face to face length (L) |      | Order Code |
|---------------------------------|-------------------------|------|------------|
|                                 | mm                      | in   |            |
| Sanitary ½" Triclamp, DIN 32676 | 230                     | 9.06 | S1**       |
| Sanitary NW10, DIN 11851        | 230                     | 9.06 | S2**       |

**SFO:** Seal-less serial measuring tube construction with flange connections\*



H2 = 322 mm (12.68 in)

| Process Connection | Face to face length (L) |       | Order Code |
|--------------------|-------------------------|-------|------------|
|                    | mm                      | in    |            |
| ANSI 1" 150# RF    | 260                     | 10.24 | A1         |
| ANSI 1" 300# RF    | 260                     | 10.24 | A2         |
| DIN DN25/PN16      | 260                     | 10.24 | D0         |
| DIN DN25/PN40      | 260                     | 10.24 | D1         |

The sensor is manufactured with two internal measurement tubes arranged side by side. In serial or single path sensors, the tubes are connected end to end creating a single path through which all fluid flows. For customization of face to face length and/or special fittings other than the ones listed on this page, please consult factory.  
*Note that larger diameter flange process connections are always possible.*

### Common Dimensions

A1 = 165 mm (6.50 in)    A2 = 180 mm (7.09 in)    B1 = 40 mm (1.57 in)    B2 = 60 mm (2.36 in)    H1 = 234 mm (9.21 in)

W: temp. range T1, TA = 0 mm (0 in), temp. range T2, T3, T4 = 150 mm (5.91 in)

Electrical box: std. = 125 x 80 x 58 mm (4.92 x 3.15 x 2.28 in), RHE16 compact = 120 x 120 x 80 mm (4.72 x 4.72 x 3.15 in)

\*SFO meters contain brazed joints. Brazing material is B-Ni82CrSiBFe-970/1000.

Customer should confirm that this material is suitable/acceptable for their process.

\*\*P<sub>max</sub> for sanitary fittings is 40 bar (580 psi) @120°C (248°F).

### Weights and Shipping Dimensions

Typical weight for standard manifold construction (PM0/SM0) sensor with female threads: approx. 5 kg (11 lb).

Typical weight for standard seal-less construction (PF0/SFO) sensor with 150# flanges: approx. 8 kg (18 lb).

RHM08 sensors typically ship in a carton approx. 60 x 41 x 32 cm (24 x 16 x 13 in) complete with transmitter and cable.

Typical gross shipping weight example: RHM08 seal-less construction sensor with 150# flanges c/w RHE08 transmitter approx. 15 kg (33 lb).

