

# RHM 12

## Standard 1 inch Coriolis Mass Flowmeter

The RHM 12 can measure flow rates up to 100 kg/min (220 lb/min) with temperatures in excess of 350°C and pressures up to 331 bar. This model is truly a versatile solution, manufactured by GE's Rheonik mass flowmeter experts.

### Applications

- General control
- Dosing
- Mixing
- Batching
- Injections
- Filling

### Features

- Flow uncertainty down to 0.12%
- Density uncertainty down to 0.5%
- Repeatability better than 0.05%
- Unique torsion oscillator
- Typical measuring ranges from 1 to 100 kg/min
- Minimal flows as low as 0.75 kg/min
- Optimized solutions for batching operation
- Customization possible
- Extra compact design with minimal space requirement
- Hazardous Area Approvals (ATEX, CSA, ...)



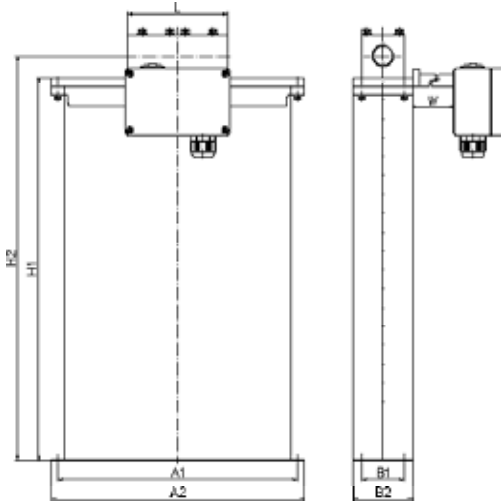
### Advantages

- Torsion oscillator design assures most stable and basically drift free measurement and increased signal to noise ratio
- Not sensitive to changes in pressure
- Longest life time and increased safety - low stress in welds and increased wall thickness against abrasion
- No moving parts, practically no maintenance
- Removable connection manifold available



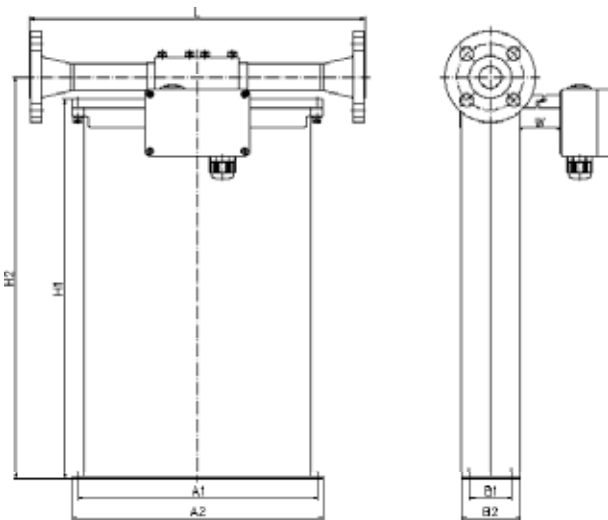
# General Dimensions RHM 12

## PM0/SM0 (parallel/serial manifold construction)



Type removable manifold with PTFE seals and thread connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Female Thread G 3/4"	120	4.72	G1
	Female Thread 3/4" NPT	120	4.72	N1



Type removable manifold with PTFE seals and flange connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN25/PN40	400	15.75	D1
	Flange DIN DN25/PN100	400	15.75	D2
	Flange ANSI 1" 150# RF/SF	400	15.75	A1
	Flange ANSI 1" 300# RF/SF	400	15.75	A2
	Flange ANSI 1" 600# RF/SF	400	15.75	A3
	Flange ANSI 1" 1500# RF/SF	450	17.72	A6
	Flange ANSI 1" 1500# RTJ	450	17.72	R1
Optional	Flange DIN DN25/PN160	400	15.75	D4
	Flange JIS RF 10k 25A (1")	400	15.75	J1
	Flange JIS RF 20k 25A (1")	400	15.75	J2

A1 = 285 mm (11.22 in)  
 A2 = 300 mm (11.81 in)  
 H1 = 454 mm (17.87 in)  
 H2 = 481 mm (18.94 in)

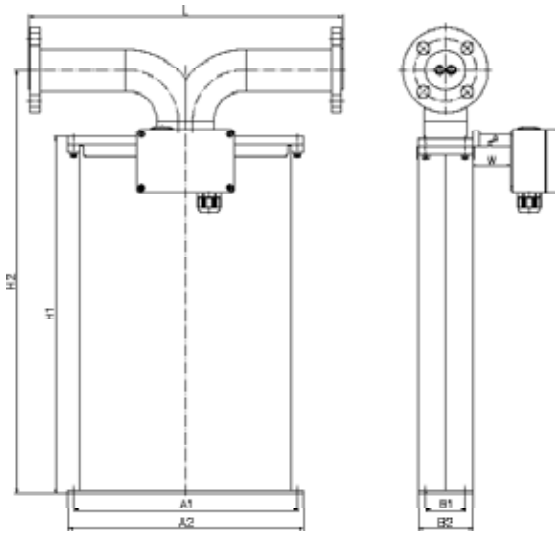
B1 = 50 mm (1.97 in)  
 B2 = 70 mm (2.76 in)

Terminal box (without cable gland) 125 x 80 x 58 mm (4.92 x 3.15 x 2.28 in)  
 W = 0 mm for Temperature Range T1 and TA  
 W = 150 mm (5.91 in) for Temperature Range T2

For weights and packaging dimensions please see last page of this section.

# General Dimensions RHM 12

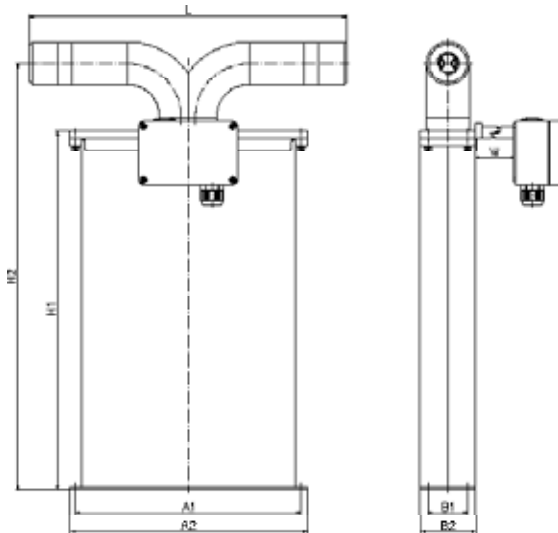
**PFO** (parallel, sealless construction with flange connection)



Type parallel, welded measuring loops without seals and flange connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN25/PN40	400	15.75	D1
	Flange DIN DN25/PN100	400	15.75	D2
	Flange ANSI 1" 150# RF/SF	400	15.75	A1
	Flange ANSI 1" 300# RF/SF	400	15.75	A2
	Flange ANSI 1" 600# RF/SF	400	15.75	A3
	Flange ANSI 1" 1500# RF/SF	400	15.75	A6
	Flange ANSI 1" 1500# RTJ	400	15.75	R1
Optional	Flange DIN DN25/PN160	400	15.75	D4
	Flange ANSI 1" 600# RTJ	400	15.75	R3
	Flange ANSI 1" 2500# RTJ	400	15.75	R2
	Grayloc Hub 1 1/2" GR11	400	15.75	H3
	Flange JIS RF 10k 25A (1")	400	15.75	J1
	Flange JIS RF 20k 25A (1")	400	15.75	J2

**PFT** (parallel, sealless construction with thread connection)



Type parallel, welded measuring loops without seals and thread connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Female Thread G 3/4"	400	15.75	G1
	Female Thread 3/4" NPT	400	15.75	N1
	Swagelok 3/4" Tube inlet (SS-1210-1-12W)	470	18.50	W1

A1 = 285 mm (11.22 in)  
 A2 = 300 mm (11.81 in)  
 H1 = 454 mm (17.87 in)  
 H2 = 540 mm (21.26 in)

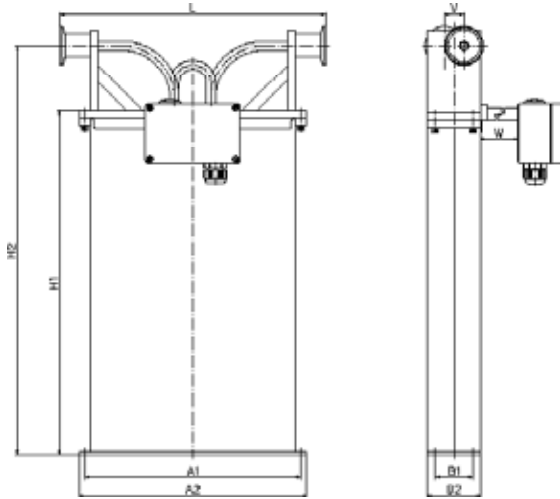
B1 = 50 mm (1.97 in)  
 B2 = 70 mm (2.76 in)

Terminal box (without cable gland) 125 x 80 x 58 mm (4.92 x 3.15 x 2.28 in)  
 W = 0 mm for Temperature Range T1 and TA  
 W = 150 mm (5.91 in) for Temperature Range T2, T3 and T4

For weights and packaging dimensions please see last page of this section.

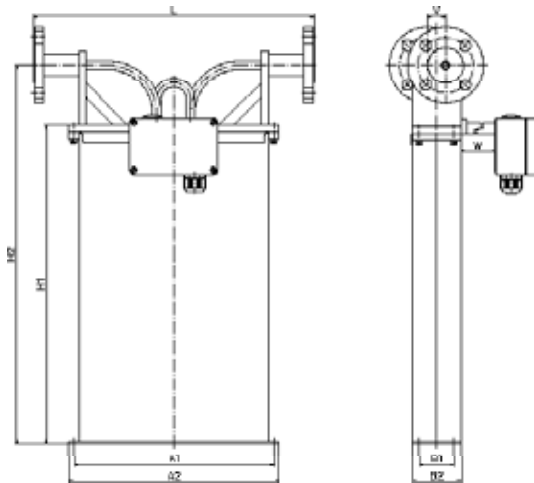
# General Dimensions RHM 12

SFO (serial, sealless construction without dead spaces) (\*)



Type single path, welded measuring loops without seals and sanitary connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Sanitary 1" Triclamp, DIN 32676	350	13.78	S0
	Sanitary NW20, DIN 11851	350	13.78	S4



Type single path, welded measuring loops without seals and flange connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN25/PN40	400	15.75	D1
	Flange ANSI 1" 150# RF/SF	400	15.75	A1
	Flange ANSI 1" 300# RF/SF	400	15.75	A2
Optional	Flange DIN DN40/PN40	400	15.75	D7

A1 = 285 mm (11.22 in)  
 A2 = 300 mm (11.81 in)  
 H1 = 454 mm (17.87 in)  
 H2 = 540 mm (21.26 in)

B1 = 50 mm (1.97 in)  
 B2 = 70 mm (2.76 in)  
 V = 26 mm (1.02 in)

Terminal box (without cable gland) 125 x 80 x 58 mm (4.92 x 3.15 x 2.28 in)  
 W = 0 mm for Temperature Range T1 and TA  
 W = 150 mm (5.91 in) for Temperature Range T2, T3 and T4

(\*) SFO construction contains brazed joints (brazing material B-Ni82CrSiBFe-970/1000) which are not as corrosion resistant as the piping material 1.4571 (316Ti). Fully welded joints for corrosive liquids and higher pressure ratings can be provided – please consult your local agent..

Weight in standard manifold construction with female threads: approx. 14 kg (31 lb)

Weight in standard sealless construction and 150# flanges: approx. 16 kg (35 lb)

Shipping on pallet approx. 70 x 40 x 55 cm (27.6 x 15.7 x 21.7 in), gross weight with sealless construction, 150# standard flanges and RHE 08 approx. 27 kg (60 lb)

Finish type of our ANSI flanges corresponds to SF (AARH 125 up to 250 µm, Ra 3.2 up to 6.3 µm)

For customization with regard to face to face length and special fittings, please consult your local agent

Please note that larger diameter process connections are always possible.

# Pressure Rating RHM 12

The maximum pressure (pmax) of a sensor is determined by its weakest part. The weakest part can be the measuring loops (pmax indicated below) or the construction type (pmax indicated in the Basic Order Code section, last page) or the selected flanges / fittings (for pmax please see respective standard).

## pmax of P1 measuring loops, standard M1 standard material - 1.4571 (316Ti) OD x WT 12 x 1 mm (0.472 x 0.039 in)

bar	°C	psi	°F
212	50	3075	122
190	120	2756	248
164	210	2379	410
138	350	2002	662

## pmax of P1 measuring loops M3 optional material - 2.4602 (Alloy C22) OD x WT 12 x 1 mm (0.472 x 0.039 in)

bar	°C	psi	°F
292	50	4235	122
258	120	3742	248
220	210	3191	410
184	350	2669	662

## pmax of P2 measuring loops M1 standard material - 1.4571 (316Ti) OD x WT 12 x 1.5 mm (0.472 x 0.059 in)

bar	°C	psi	°F
331	50	4801	122
296	120	4293	248
255	210	3698	410
215	350	3118	662

# Performance RHM 12

Max Flow Rate  $Q_{max}$  = 100 kg/min (220 lb/min),  
 $Q_{nom}$  (\*) = 75 kg/min (165 lb/min)

Standard Models		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
100	220	0.20
40	88	0.20
10	22	0.20
5.0	11	0.20
2.0	4.4	0.50

Goldline Models (**)- selected sensors		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
75	165	0.10
40	88	0.10
10	22	0.10
7.50	17	0.10
3.75	8.3	0.12

Low Flow Models (**)- selected sensors		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
40	88	0.20
20	44	0.20
10	22	0.20
2.0	4.4	0.20
1.5	3.3	0.60

## Repeatability

Better  $\pm 0.1\%$  of rate,  
 Goldline 0.05%

## Density

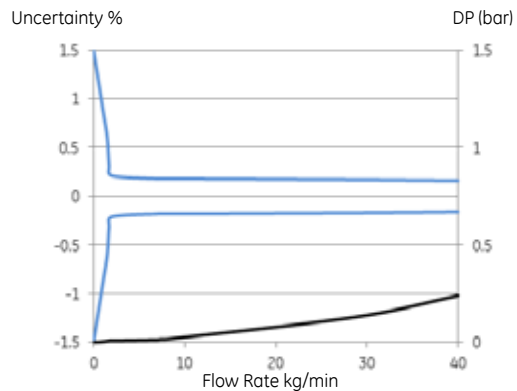
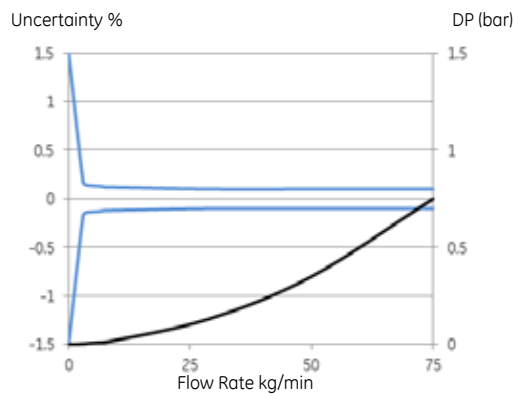
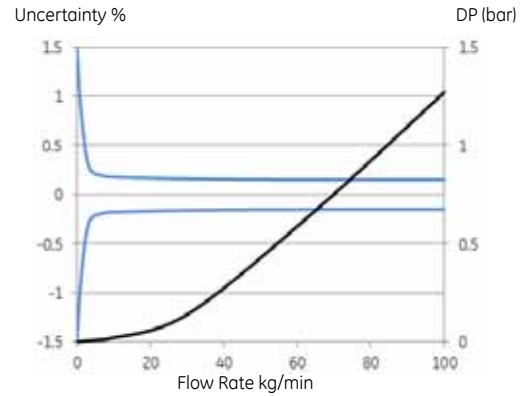
Down to 0.5% uncertainty

## Temperature

Better  $\pm 1^\circ\text{C}$

(\*) Nominal flow  $Q_{nom}$  refers to roughly 8 - 10 m/s (26 - 33 ft/s) velocity in measuring loops for best performance.

(\*\*) Selected sensors are only available in combination with temperature options T1, TA, standard material and pressure range.



- Serial/single path versions offer the same accuracy at half the flow ( $Q_{max}$  serial version = 50 kg/min).
- No relevant pressure effect due to torsional oscillation and semi-circle (non-deforming) measurement section.
- Uncertainty of reading (incl. zero drift) indications refer to reference conditions  $\text{H}_2\text{O}$ , 18-24°C (66 - 76°F), 1 - 3 bar (15 - 45 psi) and installation according to field manual.
- Pressure drop indications refer to  $\text{H}_2\text{O}$ , with parallel measuring loops type P1 and standard manifold block connections.
- For calibration to customer range and / or with improved uncertainty, please consult factory.

# General Specifications RHM 12

## Temperature Range

- NT Models from -20 to +120°C (-4 to +248°F)
  - ET Models from -45 to +120°C (-49 to +248°F)
  - ET2 Models from -45 to +210°C (-49 to +410°F)
  - ET1 Models from -196 to +50°C (-320 to +122°F)
  - HT Models from 0 to 350°C (+32 to +662°F)
- (Heating for housing optional, please consult your local agent)

## Electrical Connection

- Junction box Aluminium coated (standard). Junction box in SS 316Ti optional
- Cable entry M25 x 1.5. Optional cable entries M20 x 1.5, 1/2" NPT or 3/4" NPT
- Max cable length between RHM and RHE is 100m (330 ft). 200m (660 ft) only with factory approval

## Material of Wetted Parts

- 1.4571 / SS 316 Ti / UNS S31635 (standard)
- 2.4602 / Alloy C22 / UNS N06022
- Tantalum
- Others on request

## Sensor Enclosure/Housing

- Stainless Steel 1.4301 / SS 304, optional in 1.4571 / SS 316Ti. Others on request
- Protection Class IP 65. Optional IP 66 / NEMA 4x

## Approvals

- ATEX Ex II 1 G, EEx ia IIC T6-T1
- CSA USA-Canada, Class I, Div. 1, Groups A, B, C, D
- PED according to directive 97/23/EC: Art.3 (3) Sound Engineering Practice (SEP), Module A1 or Module B + C1 (depending on construction type and measured fluid)
- Others on request

# Basic Order Code RHM 12

## Sensor Size

### Temperature Range

- T1 NT from -20°C to +120°C (standard)
- TA ET from -45°C to +120°C
- T2 ET2 Extended Temperature Range from -45°C to +210°C
- T3 ET1 Extended Temperature Range from -196°C to +50°C
- T4 HT High Temperature Range from 0°C to +350°C

### Pressure Range of Measuring Loops@ 120°C and M1 material

- P1 pmax = 190 bar, max. CL 1500 (standard)
- P2 pmax = 296 bar

### Construction Type (pmax indications @ 120°C)

- PM0 Parallel Measuring Loops with removable Manifold and PTFE Seals, pmax = 290 bar with thread connection, 214 bar with flange connection
- SM0 Serial Measuring Loops with removable Manifold and PTFE Seals, pmax = 260 bar with thread connection, 214 bar with flange connection
- PF0 Parallel Measuring Loops Seal Less Version
- SF0 Serial Measuring Loops Seal Less Version Sanitary, pmax = 42.9 bar  
Upon request special, fully welded version, pmax = 246 bar
- PFT Parallel Measuring Loops Seal Less Version for Thread Connection, pmax = 250 bar

### Material of Wetted Parts

- M1 Measuring Loops and Manifold/Connection 1.4571 (316Ti) (standard)
- M3 Measuring Loops and Connection Part 2.4602 (Alloy C22), Seal Less Construction Type only
- M4 Measuring Loops and Connection Part Tantalum, PF0 Construction Type only

### Process Connection

- D1 Flange DIN DN25/PN40 Form C (EN 1092-1 Form B1)
- D2 Flange DIN DN25/PN100 Form E (EN 1092-1 Form B2)
- A1 Flange ANSI 1" 150# RF/SF
- A2 Flange ANSI 1" 300# RF/SF
- A3 Flange ANSI 1" 600# RF/SF
- A6 Flange ANSI 1" 1500# RF
- R1 Flange ANSI 1" 1500# RTJ
- G1 Female Thread G 3/4"
- N1 Female Thread 3/4" NPT
- W1 Swagelok 3/4" Tube inlet (SS-1210-1-12W), standard material only
- S0 Sanitary 1" Triclam, DIN 32676, pmax = 17.2 bar @ 120°C
- S4 Sanitary NW20, DIN 11851, pmax = 40 bar @ 120°C
- Others on request

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