

# RHM 15

## Medium Sized Coriolis Mass Flowmeter

The RHM 15 can measure flow rates up to 200 kg/min (440 lb/min) with temperatures in excess of 350°C and pressures up to 540 bar. This model is truly a reliable solution, manufactured by GE's Rheonik mass flowmeter experts.

### Applications

Used in industry for flow measurement applications requiring high mass flow accuracy.

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

### Features

- Suitable for pressure up to 540 bar
- Flow uncertainty down to 0.12%
- Density uncertainty down to 0.5%
- Repeatability better than 0.05%
- Unique torsion oscillator
- Typical measuring ranges from 2 to 200 kg/min
- Minimal flows as low as 1 kg/min
- Optimized solutions for batching operation
- Customization possible
- Hazardous Area Approvals (ATEX, CSA, ...)



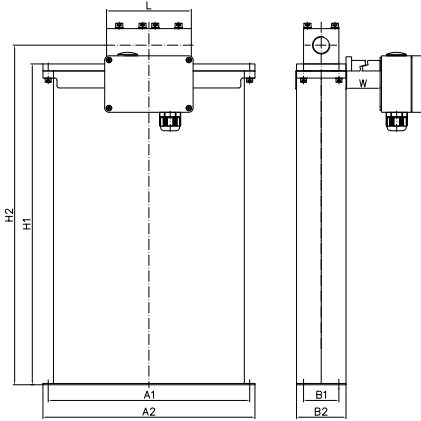
### Advantages

- 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



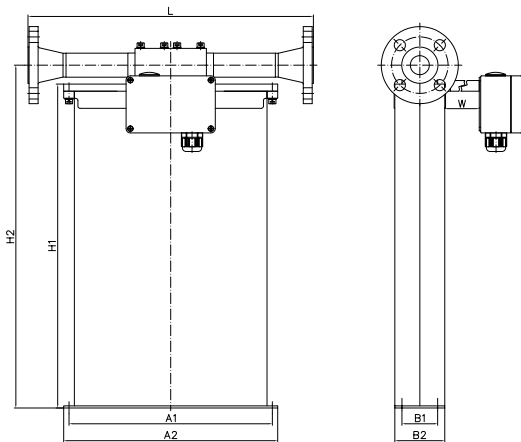
# General Dimensions RHM 15

PM0/SM0/PH0 (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  
(only with PM0, SM0 manifold)

	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# RTJ	450	17.72	R3
Optional	Flange DIN DN25/PN160	400	15.75	D4
	Flange ANSI 1" 1500# RF/SF	450	17.72	A6
	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)

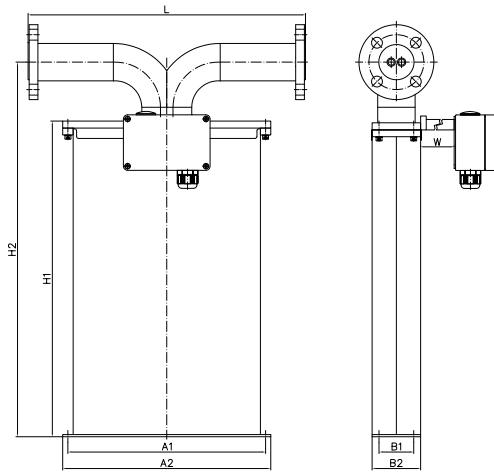
B1 = 50 mm (1.97 in)  
B2 = 70 mm (2.76 in)

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 15

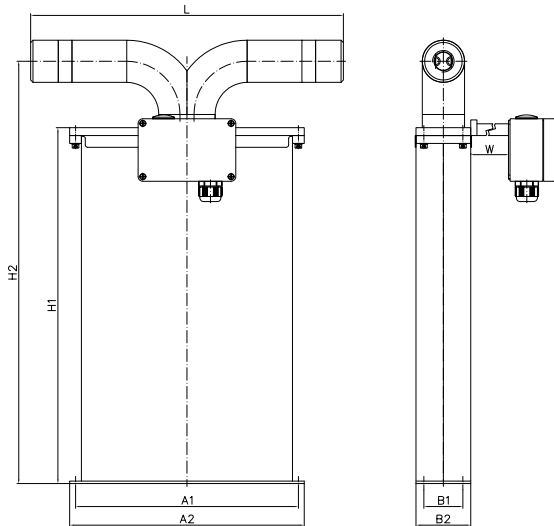
PFO (parallel, sealless construction with flange connection)



Type parallel, welded measuring loops without seals and flange connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN40/PN40	400	15.75	C1
	Flange DIN DN40/PN100	400	15.75	C2
	Flange ANSI 1 1/2" 150# RF/SF	400	15.75	F1
	Flange ANSI 1 1/2" 300# RF/SF	400	15.75	F2
	Flange ANSI 1 1/2" 600# RF/SF	400	15.75	F3
	Flange ANSI 1 1/2" 1500# RF/SF	400	15.75	F5
	Flange ANSI 1 1/2" 1500# RTJ	400	15.75	R4
	Flange ANSI 1 1/2" 2500# RF/SF	450	17.72	F4
	Flange ANSI 1 1/2" 2500# RTJ	450	17.72	R5
Optional	Flange DIN DN40/PN160	400	15.75	C4
	Flange ANSI 2" 1500# RTJ	500	19.69	R1
	Grayloc Hub 1 1/2" GR11	400	15.75	H6
	Grayloc Hub 2" GR11	400	15.75	H8
	Grayloc Hub 2" GR14	400	15.75	H3
	Flange JIS RF 10k 40A (1 1/2")	400	15.75	J1
	Flange JIS RF 20k 40A (1 1/2")	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)

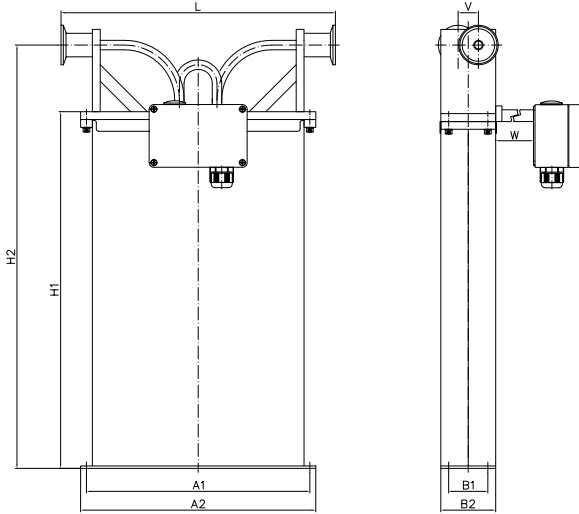
B1 = 50 mm (1.97 in)  
 B2 = 70 mm (2.76 in)

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.

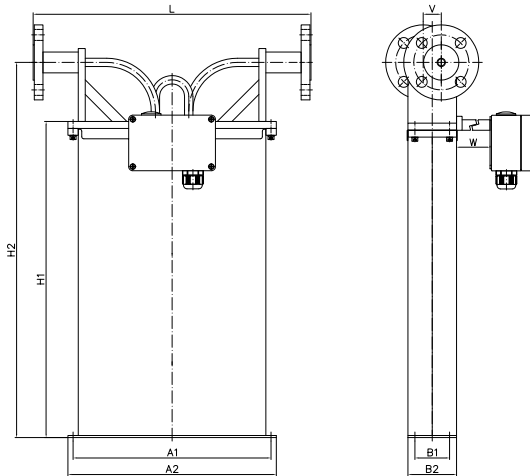
# General Dimensions RHM 15

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



Standard	Process Connection	Face to face length (L)		Order Code
		mm	in	
	Sanitary 1" Triclamp, DIN 32676	350	13.78	S0
	Sanitary NW20, DIN 11851	350	13.78	S2

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



Standard	Process Connection	Face to face length (L)		Order Code
		mm	in	
	Flange DIN DN40/PN40	400	15.75	C1
	Flange ANSI 1 1/2" 150# RF/SF	400	15.75	F1
	Flange ANSI 1 1/2" 300# RF/SF	400	15.75	F2

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

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 15

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 15 x 1 mm (0.59 x 0.039 in)**

bar	°C	psi	°F
165	50	2393	122
150	120	2176	248
127	210	1842	410
107	350	1552	662

**pmax of P1 measuring loops**  
**M3 optional material - 2.4602 (Alloy C22)**  
**OD x WT 15 x 1 mm (0.59 x 0.039 in)**

bar	°C	psi	°F
228	50	3307	122
201	120	2915	248
172	210	2495	410
143	350	2074	662

**pmax of P2 measuring loops**  
**M1 standard material - 1.4571 (316Ti)**  
**OD x WT 15 x 2 mm (0.59 x 0.079 in)**

bar	°C	psi	°F
352	50	5105	122
300	120	4351	248
250	210	3626	410
210	350	3046	662

**pmax of P2 measuring loops**  
**M3 optional material - 2.4602 (Alloy C22)**  
**OD x WT 15 x 2.2 mm (0.59 x 0.087 in)**

bar	°C	psi	°F
540	50	7832	122
477	120	6918	248
407	210	5903	410
339	350	4917	662

**pmax of P3 measuring loops**  
**M1 standard material - 1.4571 (316Ti)**  
**OD x WT 15 x 3 mm (0.59 x 0.118 in)**

bar	°C	psi	°F
540	50	7832	122
450	120	6527	248
350	210	5076	410
300	350	4351	662

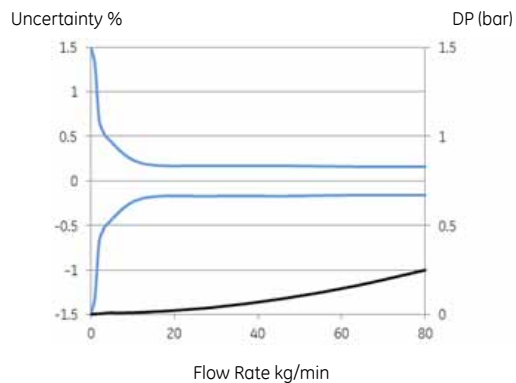
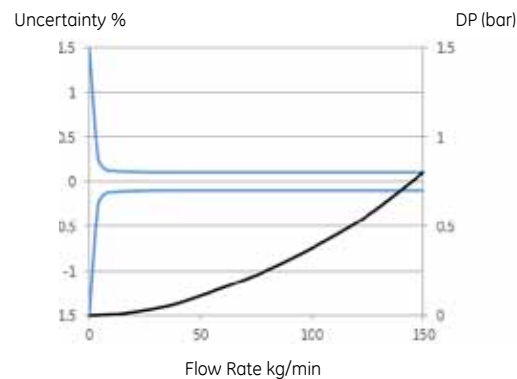
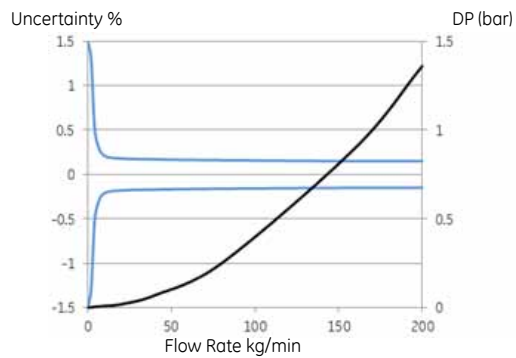
# Performance RHM 15

Max Flow Rate  $Q_{max}$  = 200 kg/min (441 lb/min),  $Q_{nom}$  (\*) = 150 kg/min (331 lb/min)

Standard Models		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
200	441	0.20
100	220	0.20
50	110	0.20
10	22	0.20
4	8.8	0.50

Goldline Models (**)- selected sensors		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
150	331	0.10
75	165	0.10
50	110	0.10
15	33.1	0.10
7.5	16.5	0.12

Low Flow Models (**)- selected sensors		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
80	176	0.20
50	110	0.20
15	33	0.20
4	8.8	0.20
2	4.4	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 = 100 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.

# RHM 15 Specifications

## 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 15

## Sensor Size

### Temperature Rating

- 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 = 150 bar, max. CL 600 / PN40 (standard)
- P2** pmax = 300 bar
- P3** pmax = 450 bar-

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

- PMO** Parallel Measuring Loops with removable Manifold and PTFE Seals, pmax = 230 bar with thread connection, 214 bar with flange connection
- SMO** Serial Measuring Loops with removable Manifold and PTFE Seals, pmax = 230 bar with thread connection, 214 bar with flange connection
- PHO** Parallel Measuring Loops with High Pressure Manifold and PTFE Seals, pmax = 420 bar
- PF0** Parallel Measuring Loops Seal Less Version
- SF0** Serial Measuring Loops Seal Less Version Sanitary, pmax = 42.9 bar upon request, a fully welded version is available, pmax = 325 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 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)
  - C1** Flange DIN DN40/PN40 Form C (EN 1092-1 Form B1)
  - C2** Flange DIN DN40/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
  - R3** Flange ANSI 1" 1500# RTJ
  - F1** Flange ANSI 1 1/2" 150# RF/SF
  - F2** Flange ANSI 1 1/2" 300# RF/SF
  - F3** Flange ANSI 1 1/2" 600# RF/SF
  - F5** Flange ANSI 1 1/2" 1500# RF/SF
  - R4** Flange ANSI 1 1/2" 1500# RTJ
  - F4** Flange ANSI 1 1/2" 2500# RF/SF
  - R5** Flange ANSI 1 1/2" 2500# 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" Triclamp, DIN 32676, pmax = 17.2 bar @ 120°C
  - S2** Sanitary NW20, DIN 11851, pmax = 40 bar @ 120°C
- Others on request

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