

RHM 20

Medium Sized Coriolis Mass Flowmeter

The RHM 20 can measure flow rates up to 300 kg/min (661 lb/min) with temperatures in excess of 350°C and pressures up to 392 bar. This model is medium sized with true reliability for a versatile solution, manufactured by GE's Rheonik mass flowmeter experts.

Applications

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

Features

- Suitable for pressure up to 392 bar
- Flow uncertainty down to 0.15%
- Density uncertainty down to 0.5%
- Repeatability better than 0.05%
- Unique torsion oscillator
- Typical measuring ranges from 3 to 300 kg/min
- Minimal flows as low as 2.25 kg/min
- Optimized solutions for batching operation
- Customization possible
- Hazardous Area Approvals (ATEX, CSA, ...)



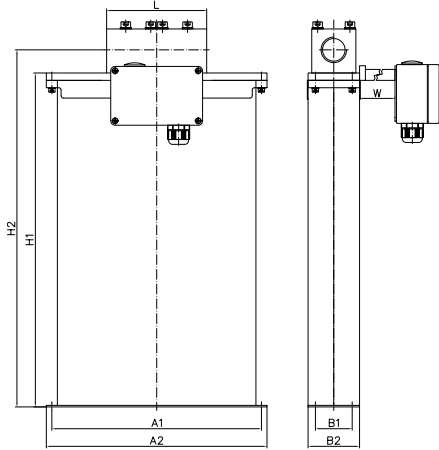
Advantages

- 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



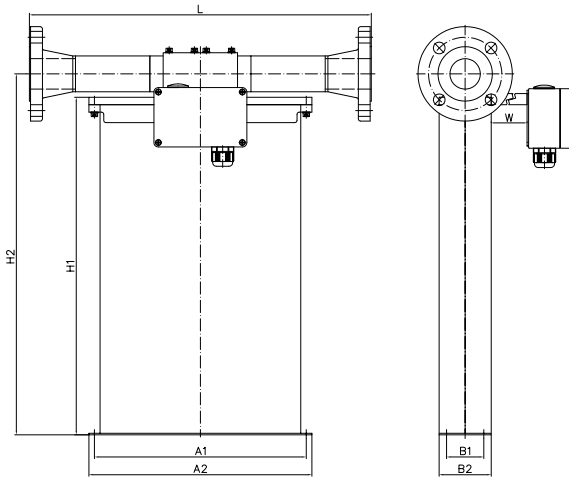
General Dimensions RHM 20

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 1"	136	5.35	G1
	Female Thread 1" NPT	136	5.35	N1



Type removable manifold with PTFE seals and flange connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN40/PN40	460	18.11	C1
	Flange DIN DN40/PN100	500	19.69	C2
	Flange ANSI 1 1/2" 150# RF/SF	460	18.11	F1
	Flange ANSI 1 1/2" 300# RF/SF	460	18.11	F2
	Flange ANSI 1 1/2" 600# RF/SF	500	19.69	F3
Optional	JIS B 2220 RF 10k 40A (1 1/2")	460	18.11	J1
	JIS B 2220 RF 20k 40A (1 1/2")	460	18.11	J2

A1 = 285 mm (11.22 in)
 A2 = 300 mm (11.81 in)
 H1 = 454 mm (17.87 in)
 H2 = 486 mm (19.11 in)

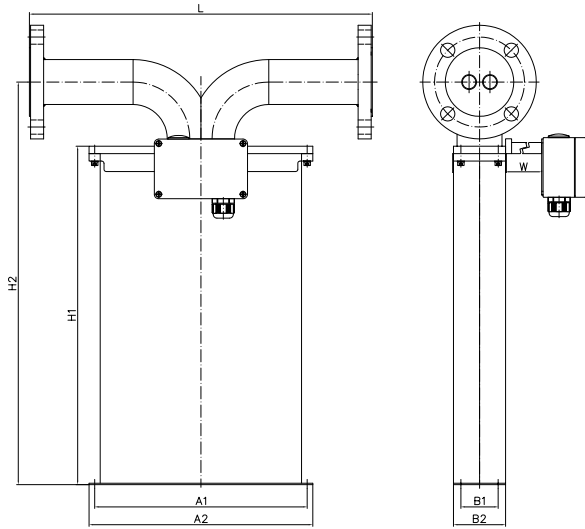
B1 = 50 mm (1.97 in)
 B2 = 70 mm (2.76 in)

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 20

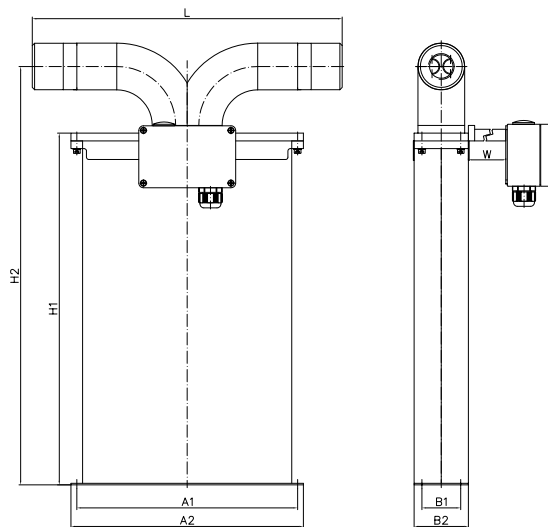
PFO (parallel, sealless construction with flange connection)



Type parallel, welded measuring loops without seals and flange connection

	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN50/PN40	460	18.11	D1
	Flange DIN DN50/PN100	500	19.69	D2
	Flange ANSI 2" 150# RF/SF	460	18.11	A1
	Flange ANSI 2" 300# RF/SF	460	18.11	A2
	Flange ANSI 2" 600# RF/SF	500	19.69	A3
	Flange ANSI 2" 1500# RF/SF	500	19.69	A5
	Flange ANSI 2" 1500# RTJ	500	19.69	R2
Optional	Flange DIN DN50/PN160	500	19.69	D3
	Flange ANSI 2" 600# RTJ	500	19.69	R1
	Flange ANSI 2" 2500# RF/SF	500	19.69	A8
	Flange ANSI 2" 2500# RTJ	500	19.69	R4
	Flange JIS RF 10k 50A (2")	460	18.11	K1

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 1"	400	15.75	G1
	Female Thread 1" NPT	400	15.75	N1
	Swagelok 1" Tube inlet (SS-1610-1-16W)	560	22.05	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)

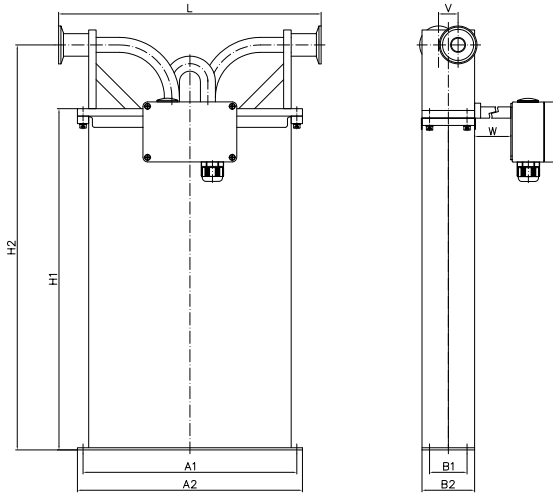
B1 = 50 mm (1.97 in)
 B2 = 70 mm (2.76 in)

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.

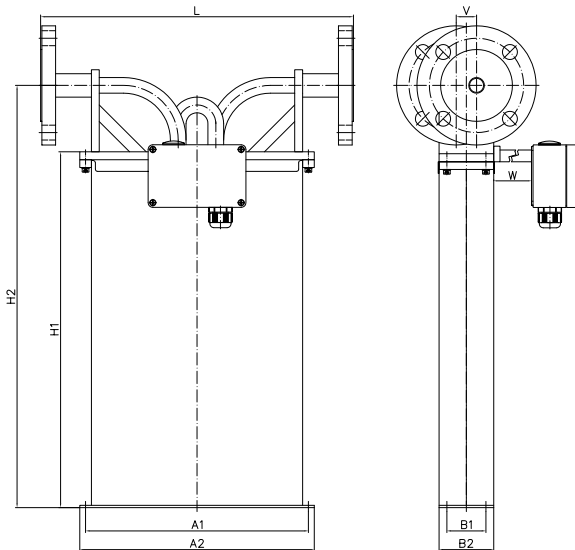
General Dimensions RHM 20

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



	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Sanitary 1" Triclamp, DIN 32676	350	13.78	S1
	Sanitary NW20, DIN 11851	350	13.78	S2

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



	Process Connection	Face to face length (L)		Order Code
		mm	in	
Standard	Flange DIN DN50/PN40	460	18.11	D1
	Flange ANSI 2" 150# RF/SF	460	18.11	A1
	Flange ANSI 2" 300# RF/SF	460	18.11	A2

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. 16 kg (35 lb)

Weight in standard sealless construction and 150# flanges: approx. 23 kg (51 lb)

Shipping on pallet approx. 80 x 60 x 65 cm (31.5 x 23.6 x 25.6 in), gross weight with sealless construction, 150# standard flanges and RHE 08 approx. 35 kg (77 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 20

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 20 x 1 mm (0.787 x 0.039 in)

bar	°C	psi	°F
120	50	1740	122
110	120	1595	248
92	210	1334	410
77	350	1117	662

pmax of P1 measuring loops M3 optional material - 2.4602 (Alloy C22) OD x WT 19.1 x 1.25 mm (0.752 x 0.049 in)

bar	°C	psi	°F
193	50	2799	122
171	120	2480	248
146	210	2118	410
121	350	1755	662

pmax of P2 measuring loops M1 standard material - 1.4571 (316Ti) OD x WT 20 x 2 mm (0.787 x 0.079 in)

bar	°C	psi	°F
250	50	3626	122
225	120	3263	248
193	210	2799	410
162	350	2350	662

pmax of P2 measuring loops M3 optional material - 2.4602 (Alloy C22) OD x WT 19.1 x 1.65 mm (0.752 x 0.065 in)

bar	°C	psi	°F
260	50	3771	122
232	120	3365	248
196	210	2843	410
163	350	2364	662

pmax of P4 measuring loops M1 standard material - 1.4571 (316Ti) OD x WT 20 x 3 mm (0.787 x 0.118 in)

bar	°C	psi	°F
392	50	5685	122
345	120	5004	248
300	210	4351	410
250	350	3626	662

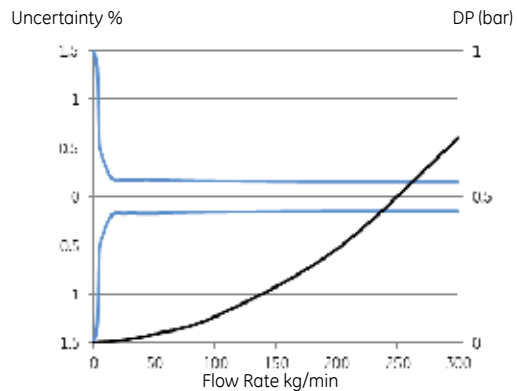
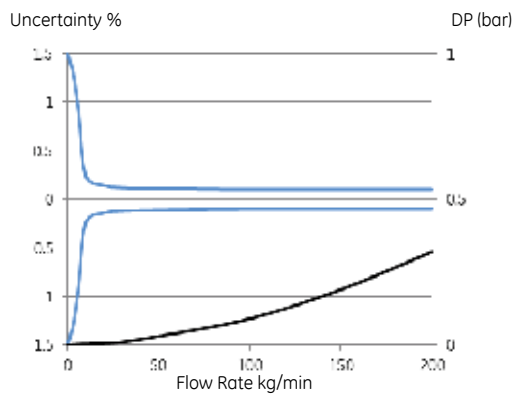
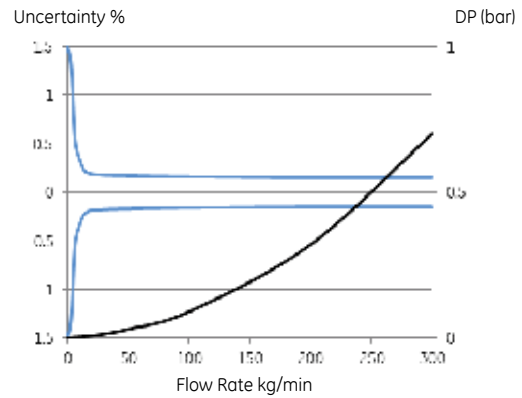
Performance RHM 20

Max Flow Rate Q_{max} and Q_{nom} (*) = 300 kg/min (661 lb/min)

Standard Models		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
300	661	0.20
150	331	0.20
50	110	0.20
15	33.1	0.20
6	13.2	0.50

Goldline Models (**)- selected sensors		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
200	441	0.15
100	220	0.15
75	165	0.15
50	110	0.15
20	44.1	0.15

Low Flow Models (**)- selected sensors		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
300	661	0.20
150	331	0.20
15.0	33.1	0.20
6.0	13.2	0.50
4.5	9.9	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 = 150 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 H_2O , 18-24°C (66 - 76°F), 1 - 3 bar (15 - 45 psi) and installation according to field manual.
- Pressure drop indications refer to H_2O , with parallel measuring loops type P1 and standard manifold block connections.
- For calibration to customer range and / or with improved uncertainty, please consult your local agent.

General Specifications RHM 20

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 20

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 = 110 bar (standard)
- P2** pmax = 225 bar
- P4** pmax = 345 bar

Construction Type (pmax indications @120°C)

- PM0** Parallel Measuring Loops with removable Manifold and PTFE Seals, pmax = 270 bar with thread connection, 185 bar with flange connection
- SM0** Serial Measuring Loops with removable Manifold and PTFE Seals, pmax = 130 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 = 200 bar
- PFT** Parallel Measuring Loops Seal Less Version for Thread Connection, pmax = 210 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

- C1** Flange DIN DN40/PN40 Form C (EN 1092-1 Form B1)
 - C2** Flange DIN DN40/PN100 Form E (EN 1092-1 Form B2)
 - D1** Flange DIN DN50/PN40 Form C (EN 1092-1 Form B1)
 - D2** Flange DIN DN50/PN100 Form E (EN 1092-1 Form B2)
 - F1** Flange ANSI 1 ½" 150# RF/SF
 - F2** Flange ANSI 1 ½" 300# RF/SF
 - F3** Flange ANSI 1 ½" 600# RF/SF
 - A1** Flange ANSI 2" 150# RF/SF
 - A2** Flange ANSI 2" 300# RF/SF
 - A3** Flange ANSI 2" 600# RF/SF
 - A5** Flange ANSI 2" 1500# RF/SF
 - R2** Flange ANSI 2" 1500# RTJ
 - G1** Female Thread G 1"
 - N1** Female Thread 1" NPT
 - W1** Swagelok 1" Tube inlet (SS-1610-1-16W), standard material only
 - S1** 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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