RHEONIK

RHM20L

Industrial Coriolis Mass Flow Meter

사양

- Standard 압력 392 bar (5685 psi)
- 온도 범위 : -196 ~ 350˚C (-320 ~ 662˚F)
- 질량 유량 정밀도 0.15%
- 밀도 정밀도 0.5%
- 재현성 0.05%
- 일반 유량 측정 범위 3 ~ 300 kg /min
- 2.25 kg/min 까지의 낮은 유량도 정확하게 측정 가능
- 유일한 비틀림 기준진동 시스템
- 고객맞춤형 connection 제작가능
- 작은 공간에 적합한 소형 디자인
- 방폭 지역 사용 인증 완료
- Stainless Steel 316 Ti 외함가능
- 유지보수가 쉬운분리형 manifold connection
- 분리형 및 소형의 트랜스미터

적용

- 일반 유량 측정
- Plant Balance
- Additive Dosing
- Mixing 및 Batching (정량 제어)
- Package and Container Filling

이점

- 비틀림 진동자 디자인은 외란 영향을 적게 받아 안정적이고 탁월한 측정이 보장 된다.
- 외부 노이즈 및 진동에 영향을 받지 않는다.
- 배관 압력 변화에 민감하지 않다.
- 견고하고 두꺼운 센서 튜브는 안전한 운전 성능 보장
- 비틀림 기준진동으로 기계적인 스트레스 영향이 적어 센서의 내구성 보장
- 고성능 (goldline) 센서 선정 가능

RHM20L General Specifications

Nominal Max Flow Range:	Parallel/dual path measurement tube versions: 300 kg/min (661.4 lb/min) Serial/single path measurement tube versions: 150 kg/min (330.7 lb/min)
Density Range:	5 to 5000 kg/m^3 (0.31 to 312 lb/ft^3)
Temperature Range:	5 temperature range options cover temperatures from -196°C to 350°C (-320°F to 662°F)
Pressure Ratings:	Dependent upon material
Electrical Connection:	Cable entry M25 x 1.5 (standard) M20 x 1.5, ½" NPT, ¾" NPT (optional) Max cable length to remote RHE transmitter 100m (330 ft)
Sensor Housing Materials:	1.4301 / 304 stainless steel (standard), 1.4571 /316Ti (optional) Epoxy coated aluminium electrical box (standard), 1.4571 / 316Ti Stainless Steel (optional)
Enclosure Type:	Protection Class IP 65. Optional IP 66 / NEMA 4X
Material of Wetted Parts:	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
Finishes:	ANSI flange finish: AARH 125 to 250 µin, Ra 3.2 to 6.3 µm
Certifications and Approvals:	ATEX approval Zone 0: Ex II 1 G Ex ia IIC T1-T6 Ga ATEX rating Zone 2: Ex II 3 G Ex nA IIC T1-T6 Gc CSA USA-Canada, Class I, Div. 1, Groups A, B, C, D PED according to 97/23/EC Art.3 (3) Sound Engineering Practice (SEP), Module A1 or Module B + Cl (as required by construction type and measured fluid)
Documentation:	All sensors are supplied with a traceable calibration certificate. Optional documentation items available: - Traceable material certificates - Certificates of origin and conformity - Welding - NACE - Quality - Production and manufacturing procedures Other documentation to client requirements available
Proof Testing:	Hydrotest, dye penetrant, x-ray, PMI
Options:	Enclosure heating matrix for high temperature applications

Transmitter Range


RHE45


RHE21


RHE26

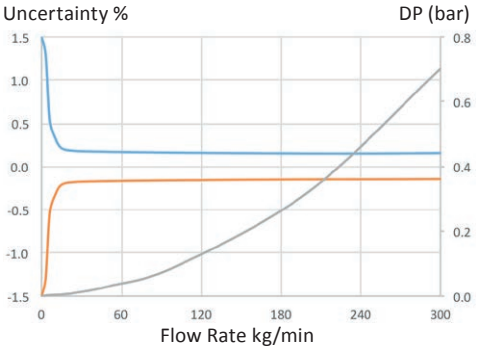

RHE27


RHE28

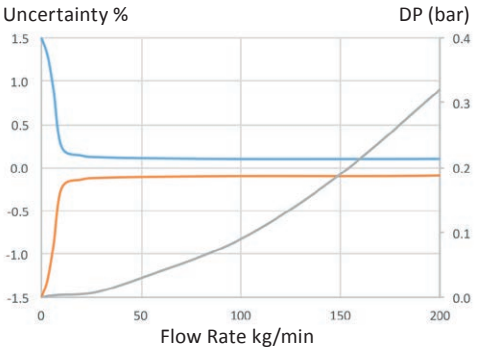
Any Rheonik Mass Flow Transmitter model can be combined with an RHM20 sensor to provide an overall mass flow measurement system to suit any requirement. Rheonik Coriolis transmitters are designed for process, industrial and OEM applications. Together they offer a tremendous range of options for system designers and end users alike.

RHM20L Measurement Performance

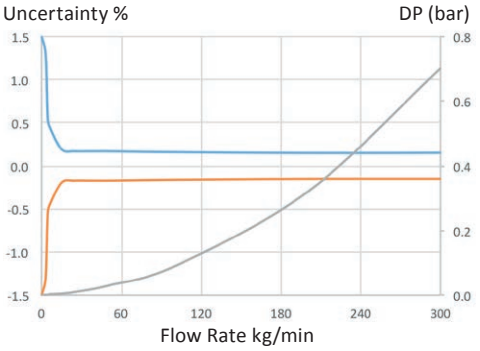
Standard Calibration		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
300	661	0.20
150	331	0.20
50	110	0.20
15	33.1	0.20
6.0	13.2	0.50



Goldline Calibration*		
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 Calibration*		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
300	661	0.20
150	331	0.20
15	33.1	0.20
6.0	13.2	0.50
4.5	9.9	0.60



*Goldline and Low Flow Calibration is not available with all configurations of the RHM20. Please check with factory.

Mass Flow Calibration Options	
A	50:1 Standard Calibration – 0.5% Uncertainty between 300 and 6 kg/min
B	20:1 Standard Calibration – 0.2% Uncertainty between 300 and 15 kg/min
G	10:1 Goldline Calibration – 0.12% Uncertainty between 200 and 20 kg/min
2	Low Flow Calibration – 0.2% Uncertainty between 300 and 15 kg/min, 0.5% between 15 and 6 kg/min, 0.6% between 6 and 4.5 kg/min

- *Uncertainty of reading (incl. zero drift) stated at reference condition of: H_2O, 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_2O flowing in a meter with P1 pressure rating and PM0 (parallel measuring tubes with manifold block) construction*
- *Serial path versions offer the same accuracy performance at half the flow (Nominal max. flow range of serial versions = 150 kg/min). Pressure drop will be greater*
- *For customized calibration range or uncertainty levels, please consult factory*

Flow Measurement Repeatability
Standard ± 0.1% of rate
Goldline ± 0.05% of rate

Density Measurement Performance (liquids)
Standard 2 point calibration ±1% of value
Optional 3 point calibration ±0.5% of value
Gas density – depends upon pressure

Temperature
Better than ± 1°C

RHM20L 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).

RHM20L Measurement Tube Pressure Ratings

Pressure Code	Material Code	Material	p_{max}				
			bar	psi		°C	°F
P1 (std.)	M1 (std.)	1.4571 (316Ti) UNS S31635	120	1740	@	50	122
			110	1595	@	120	248
			92	1334	@	210	410
			77	1117	@	350	662
P1	M3	2.4602 (Alloy C22) UNS N06022	193	2799	@	50	122
			171	2480	@	120	248
			146	2118	@	210	410
			121	1755	@	350	662
P1	M4*	Tantalum UNS R05200	62	899	@	50	122
			48	696	@	120	248
			39	566	@	210	410
P2	M1 (std.)	1.4571 (316Ti) UNS S31635	250	3626	@	50	122
			225	3263	@	120	248
			193	2799	@	210	410
			162	2350	@	350	662
P2	M3	2.4602 (Alloy C22) UNS N06022	260	3771	@	50	122
			232	3365	@	120	248
			196	2843	@	210	410
			163	2364	@	350	662
P4	M1 (std.)	1.4571 (316Ti) UNS S31635	392	5685	@	50	122
			345	5004	@	120	248
			300	4351	@	210	410
			250	3626	@	350	662

*Only with T1, TA, T2 temperature range (note max. operating temp. is 150°C) and PF0 construction type (max. ANSI 300/PN40).

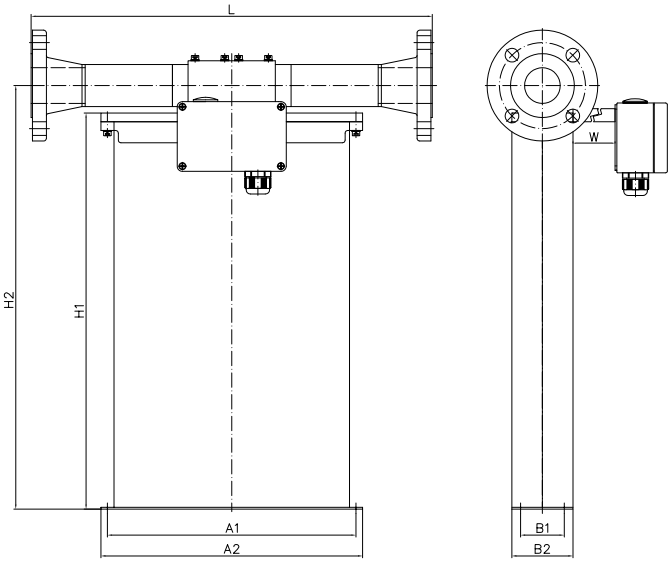
Other Materials

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.

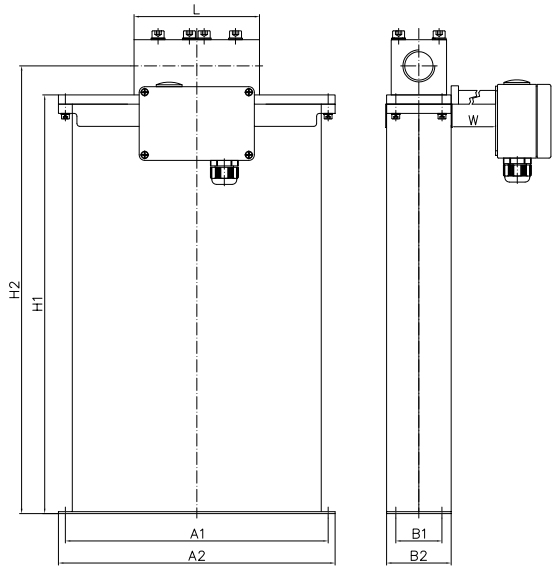
RHM20L Mechanical Construction

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



Process Connection	Face to face length (L)		Order Code
	mm	in	
ANSI 1½" 150# RF	460	18.11	F1
ANSI 1½" 300# RF	460	18.11	F2
ANSI 1½" 600# RF	500	19.69	F3
DIN DN40/PN40	460	18.11	C1
DIN DN40/PN100	500	19.69	C2
JIS B 2220 RF 10k 40A (1½")	460	18.11	J1
JIS B 2220 RF 20k 40A (1½")	460	18.11	J2

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



Process Connection	Face to face length (L)		Order Code
	mm	in	
Female Thread G 1"	136	5.35	G1
Female Thread 1" NPT	136	5.35	N1

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.

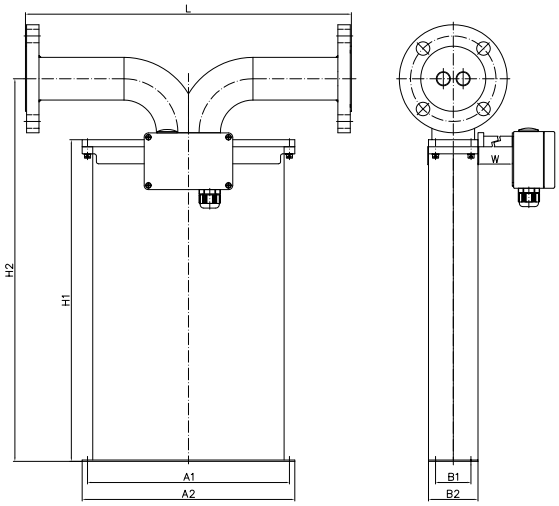
Common Dimensions

A1 = 285 mm 111.22 in) A2 = 300 mm (11.81 in) B1 = 50 mm (1.97 in) B2 = 70 mm (2.76 in) H1 = 454 mm (17.87 in) H2 = 486 mm (19.11 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.

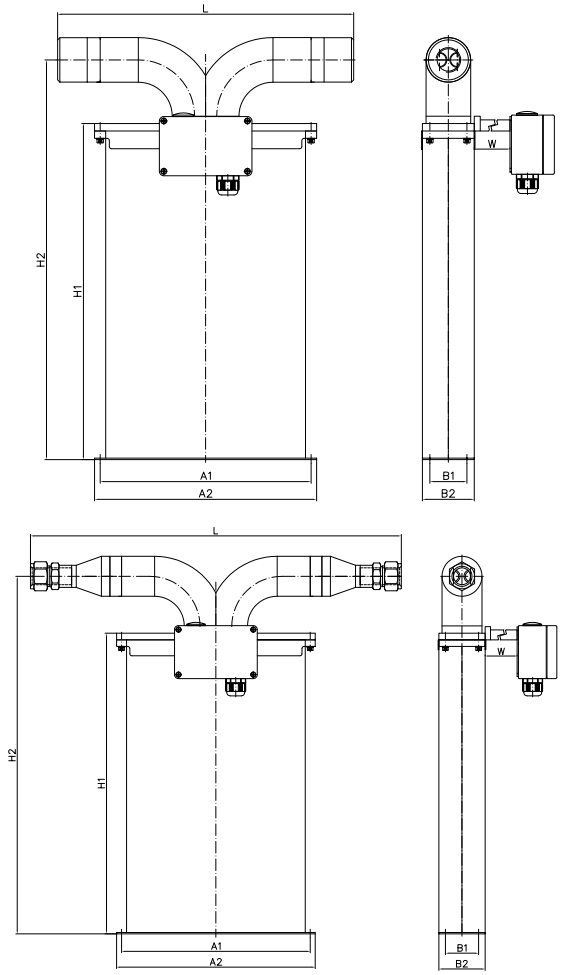
RHM20L Mechanical Construction

PF0: Seal-less parallel measuring tube construction with flange connections



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

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 1"	400	15.75	G1
Female Thread 1" NPT	400	15.75	N1
Swagelok 1" tube compression fitting (SS-1610-1-16W)	560	22.05	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 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.

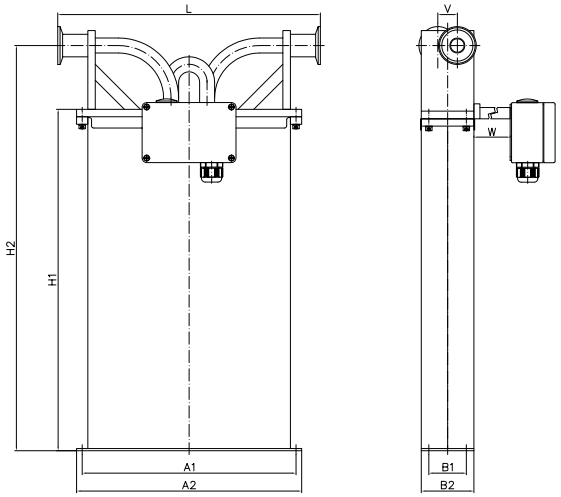
Common Dimensions

A1 = 285 mm (11.22 in) A2 = 300 mm (11.81 in) B1 = 50 mm (1.97 in) B2 = 70 mm (2.76 in) H1 = 454 mm (17.87 in) H2 = 540 mm (21.26 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.

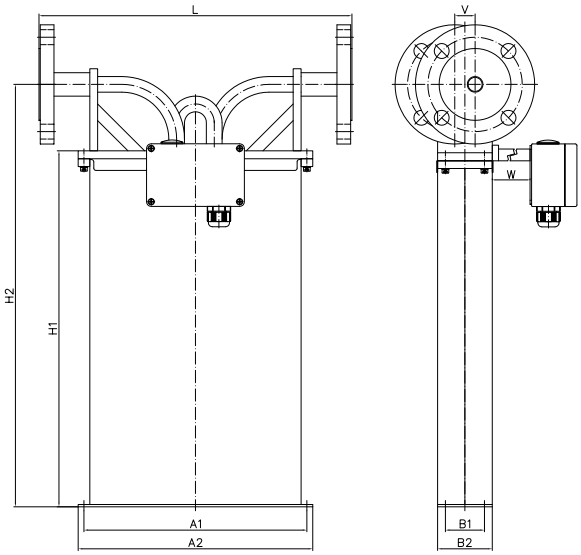
RHM20L Mechanical Construction

SF0: Seal-less serial measuring tube construction with sanitary connections*



Process Connection	Face to face length (L)		Order Code
	mm	in	
Sanitary 1" Triclamp, DIN 32676 (P_{max} = 17.2 bar (249.5 psi) @ 120°C (248°F))	350	13.78	S1
Sanitary NW20, DIN 11851 (P_{max} = 40 bar (580 psi) @ 120°C (248°F))	350	13.78	S2

SF0: Seal-less serial measuring tube construction with flange connections*



Process Connection	Face to face length (L)		Order Code
	mm	in	
ANSI 2" 150# RF	460	18.11	A1
ANSI 2" 300# RF	460	18.11	A2
DIN DN50/PN40	460	18.11	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 = 285 mm (11.22 in) A2 = 300 mm (11.81 in) B1 = 50 mm (1.97 in) B2 = 70 mm (2.76 in)
H1 = 454 mm (17.87 in) H2 = 540 mm (21.26 in) V = 26 mm (1.02 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)

* SF0 meters are constructed with offset inlet/outlet ports. Consideration should be given to the offset (dimension V) when planning installation.

Weights and Shipping Dimensions

Typical weight for standard manifold construction (PM0/SM0) sensor with female threads: approx. 16 kg (135 lb).
Typical weight for standard seal-less construction (PF0/SF0) sensor with 150# flanges: approx. 23 kg (51 lb).
RHM20 sensors typically ship on a pallet approx. 80 x 60 x 65 cm (31.5 x 23.6 x 25.6 in) complete with transmitter and cable.
Typical gross shipping weight example: RHM20 seal-less construction sensor with 150# flanges c/w RHE08 transmitter approx. 35 kg (77 lb).