



## RHM30

### Coriolis Mass Flow Meter for Plant and Loading Flows

#### Features

- Standard pressure ratings up to 798 bar (11574 psi)
- Temperature ratings from -196 to 350°C (-320 to 662°F)
- Mass flow uncertainty down to 0.15%
- Density uncertainty down to 0.5%
- Repeatability better than 0.05%
- Typical measuring ranges between 750 and 7.5 kg/min
- Accurately measure low flow rates down to 5 kg/min
- Unique robust torsion driven oscillation system
- Process connection customization available
- Minimum pipe 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
- Plant Balance
- Additive Dosing
- High Temperature Fluids
- Viscous Fluids
- Mixing, Blending, Batching
- Package and Container Filling

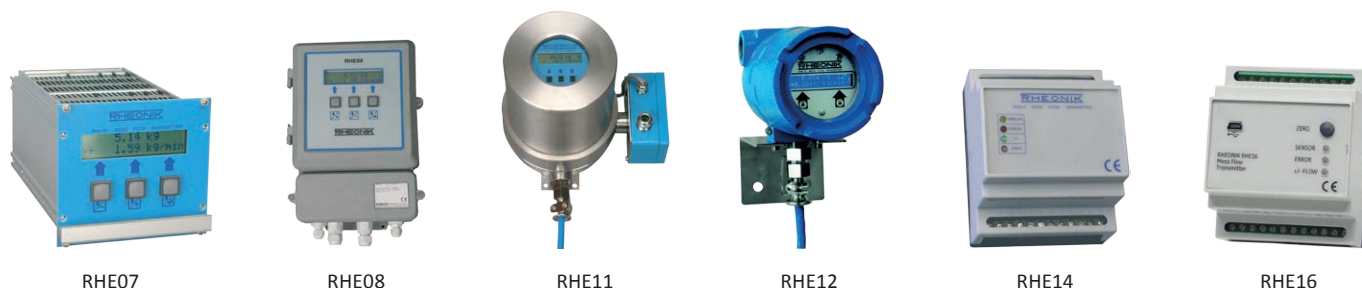
#### Benefits

- 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
- Corrosion resistant
- Long sensor life guaranteed due to low mechanical stresses in the meter mechanism
- No moving parts to wear or fail

## RHM30 General Specifications

<b>Nominal Max Flow Range:</b>	Parallel/dual path measurement tube versions: 750 kg/min (1653.5 lb/min) Serial/single path measurement tube versions: 375 kg/min (826.7 lb/min)
<b>Density Range:</b>	5 to 5000 kg/m <sup>3</sup> (0.31 to 312 lb/ft <sup>3</sup> )
<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) 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) Epoxy coated aluminium electrical box (standard), 1.4571 / 316Ti stainless steel (optional)
<b>Enclosure Type:</b>	Protection class IP 65. Optional IP 66 / NEMA 4X
<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 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 Module A1 or Module B + C1 (as required by application)
<b>Documentation:</b>	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
<b>Proof Testing:</b>	Hydrotest, dye penetrant, x-ray, PMI
<b>Options:</b>	Enclosure heating matrix for high temperature applications

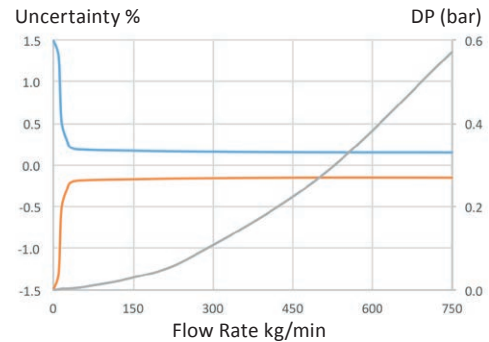
## Transmitter Range



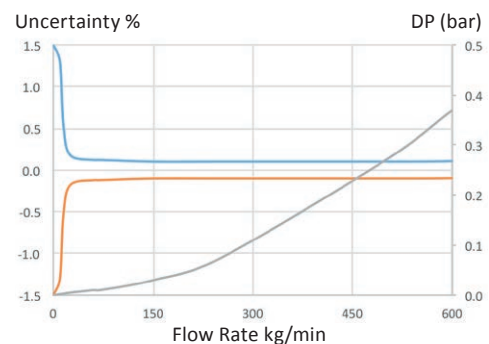
Any Rheonik Mass Flow Transmitter model can be combined with an RHM30 sensor to provide an overall mass flow measurement system to suit any requirement. Rheonik Coriolis transmitters are designed for process, industrial and OEM applications. Together they offer a tremendous range of options for system designers and end users alike.

## RHM30 Measurement Performance

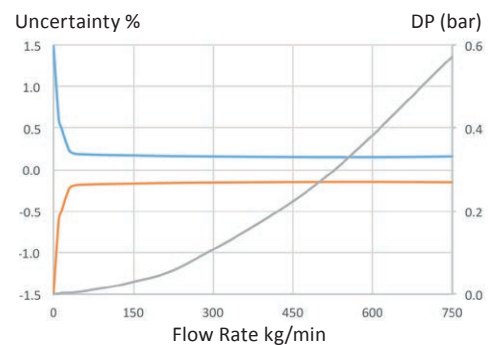
Standard Calibration		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
750	1653	0.20
500	1102	0.20
100	220	0.20
35	77.2	0.20
15	33.1	0.50



Goldline Calibration*		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
600	1323	0.15
300	661	0.15
150	331	0.15
100	220	0.15
60	132	0.15



Low Flow Calibration*		
Flow Rate		Uncertainty
kg/min	lb/min	in % of reading
750	1653	0.20
500	1102	0.20
35	77.2	0.20
15	33.1	0.50
10	22	0.60



\*Goldline and Low Flow Calibration is not available with all configurations of the RHM30. Please check with factory.

Mass Flow Calibration Options	
A	50:1 Standard Calibration – 0.5% Uncertainty between 750 and 15 kg/min
B	20:1 Standard Calibration – 0.2% Uncertainty between 750 and 35 kg/min
G	10: 1 Goldline Calibration – 0.15% Uncertainty between 600 and 60 kg/min
Z	Low Flow Calibration – 0.2% Uncertainty between 35 and 750 kg/min, 0.5% between 10 and 35 kg/min

- *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 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 = 375 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

## RHM30 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).

## RHM30 Measurement Tube Pressure Ratings

Pressure Code	Material Code	Material	$P_{max}$				
			bar	psi		°C	°F
P1 (std.)	M1 (std.)	1.4571 (316Ti) UNS S31635	137	1987	@	50	122
			123	1784	@	120	248
			106	1537	@	210	410
			89	1291	@	350	662
P1	M3	2.4602 (Alloy C22) UNS N06022	271	3931	@	50	122
			239	3466	@	120	248
			204	2959	@	210	410
			170	2466	@	350	662
P1	M4*	Tantalum UNS R05200	71	1030	@	50	122
			55	798	@	120	248
			44	638	@	210	410
P2	M1 (std.)	1.4571 (316Ti) UNS S31635	334	5105	@	50	122
			299	4351	@	120	248
			258	3626	@	210	410
			217	3046	@	350	662
P2	10**	1.4410 (Super Duplex) UNS S32750	574	8325	@	50	122
			503	7295	@	120	248
			455	6599	@	210	410
P2	62**	1.4462 (Duplex) UNS S31803	458	6643	@	50	122
			401	5816	@	120	248
			351	5091	@	210	410
P3	M1 (std.)	1.4571 (316Ti) UNS S31635	490	7107	@	50	122
			438	6353	@	120	248
			378	5482	@	210	410
			319	4627	@	350	662
P3	10**	1.4410 (Super Duplex) UNS S32750	798	11574	@	50	122
			700	10153	@	120	248
			633	9181	@	210	410
P3	62**	1.4462 (Duplex) UNS S31803	637	9239	@	50	122
			558	8093	@	120	248
			489	7092	@	210	410

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

\*\*Only with T1, TA, T2 temperature range (note min. temp. is -40°C) and PF0 construction type.

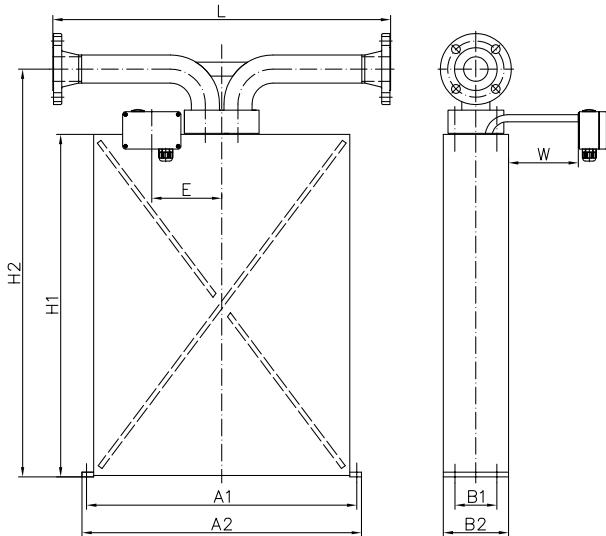
## Other Materials

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.

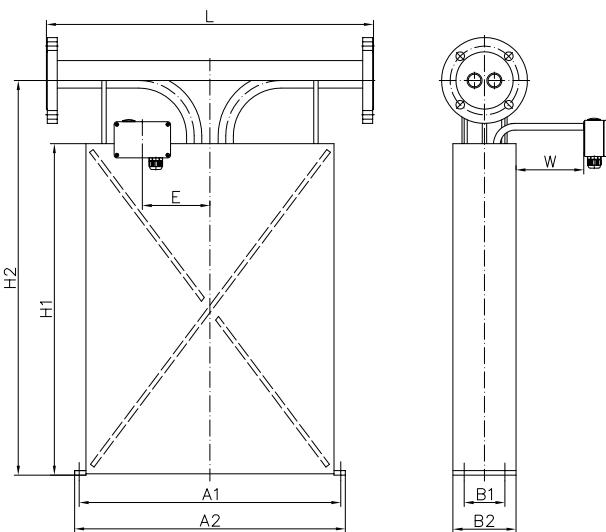
## RHM30 Mechanical Construction

**PMO:** Parallel measuring tubes with flange connection and removable manifold with PTFE seals



Process Connection	Face to face length (L)		Order Code
	mm	in	
ANSI 2" 150# RF	725	28.54	A1
ANSI 2" 300# RF	725	28.54	A2
ANSI 2" 600# RF	725	28.54	A3
ANSI 2" 600# RTJ	725	28.54	R5
DIN DN50/PN40	725	28.54	D1
DIN DN50/PN100	725	28.54	D2
JIS B 2220 RF 10k 50A (2")	725	28.54	J1
JIS B 2220 RF 20k 50A (2")	725	28.54	J2

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



Process Connection	Face to face length (L)		Order Code
	mm	in	
ANSI 3" 150# RF	725	28.54	F1
ANSI 3" 300# RF	725	28.54	F2
ANSI 3" 600# RF	725	28.54	F3
ANSI 3" 900# RF	725	28.54	A4
ANSI 3" 1500# RF	725	28.54	AA
ANSI 3" 2500# RF	900	35.43	A8
ANSI 4" 150# RF	725	28.54	L1
ANSI 4" 900# RF	725	28.54	J3
ANSI 2" 1500# RTJ	725	28.54	R4
ANSI 3" 300# RTJ	725	28.54	R0
ANSI 3" 600# RTJ	725	28.54	R1
ANSI 3" 900# RTJ	725	28.54	R2
ANSI 3" 1500# RTJ	725	28.54	R6
ANSI 3" 2500# RTJ	900	35.43	R3
DIN DN80/PN40	725	28.54	C1
DIN DN80/PN100	725	28.54	C2
DIN DN80/PN160	725	28.54	C5
DIN DN80/PN320	725	28.54	C4
Grayloc 4" GR23 Hub	725	28.54	H1

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.*

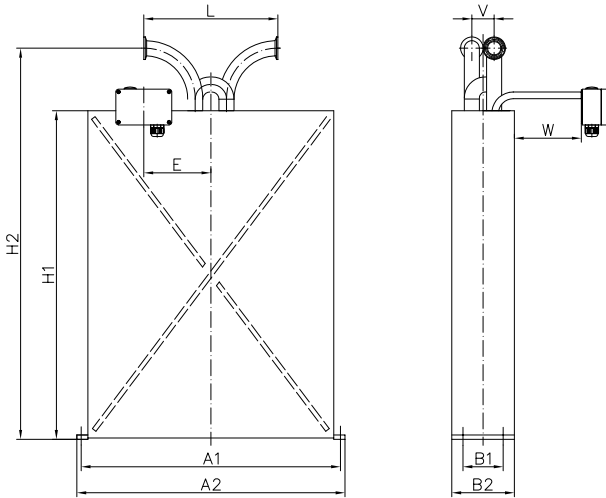
### Common Dimensions

A1 = 580 mm (22.83 in)    A2 = 600 mm (23.62 in)    B1 = 90 mm (3.54 in)    B2 = 140 mm (5.51 in)    H1 = 735 mm (28.94 in)    H2 = 875 mm (34.45 in)  
 E = 150 mm (5.91 in)    W = 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.

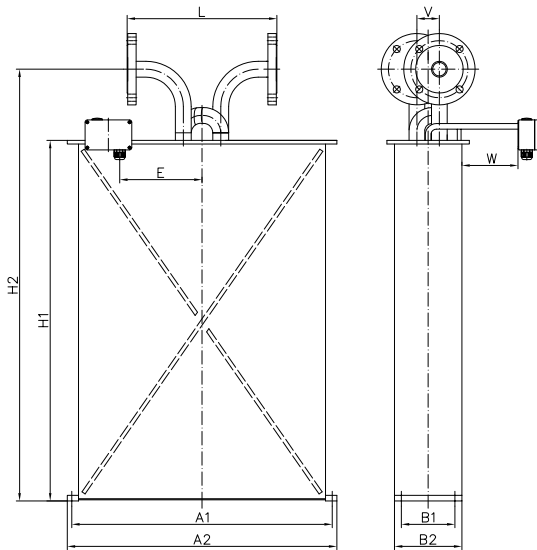
## RHM30 Mechanical Construction

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



Process Connection	Face to face length (L)		Order Code
	mm	in	
Sanitary 1½" Triclamp, DIN 32676 (P <sub>max</sub> = 17.2 bar (249.5 psi) @ 120°C (248°F))	300	11.81	S1
Sanitary NW32, DIN 11851 (P <sub>max</sub> = 40 bar (580 psi) @ 120°C (248°F))	300	11.81	S2

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



Process Connection	Face to face length (L)		Order Code
	mm	in	
ANSI 3" 150# RF	300	11.81	F1
ANSI 3" 300# RF	300	11.81	F2
ANSI 3" 600# RF	300	11.81	F3
ANSI 3" 900# RF	725	28.54	A4
ANSI 3" 150# RTJ	300	11.81	F1
ANSI 3" 300# RTJ	300	11.81	F2
ANSI 3" 600# RTJ	300	11.81	F3
ANSI 3" 900# RTJ	725	28.54	A4
ANSI 3" 1500# RTJ	725	28.54	AA
ANSI 4" 150# RTJ	300	11.81	L1
ANSI 2" 1500# RTJ	725	28.54	R4
ANSI 3" 900# RTJ	725	28.54	R2
ANSI 3" 300# RTJ	725	28.54	R0
ANSI 3" 600# RTJ	725	28.54	R1
ANSI 3" 1500# RTJ	725	28.54	R6
ANSI 4" 900# RTJ	725	28.54	J3
DIN DN80/PN40	300	11.81	C1
DIN DN80/PN100	300	11.81	C2
DIN DN80/PN160	300	11.81	C5

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 = 580 mm (22.83 in)    A2 = 600 mm (23.62 in)    B1 = 90 mm (3.54 in)    B2 = 140 mm (5.51 in)    H1 = 735 mm (28.94 in)    H2 = 875 mm (34.45 in)  
 E = 150 mm (5.91 in)    V = 50 mm (1.97 in)    W = 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 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 PM0/PF0 construction meter with 150# flanges: approx. 58 kg (128 lb).

Typical weight for SFO construction meter with 150# flanges: approx. 53 kg (117 lb).

RHM30 meters ship in a wooden crate (to ISPM 15). Typical dimensions approx. 125 x 85 x 60 cm (49 x 34 x 24 in).

Typical gross shipping weight example: RHM30 PM0/PF0 construction sensor with 150# flanges c/w RHE08 transmitter approx. 115 kg (254 lb).

# RHM30 Part Number Code

### Temperature Range

- T1 -20°C to +120°C (-4 to +248°F) (std.)
- TA -45°C to +120°C (-49 to +248°F)
- T2 -45°C to +210°C (-49 to +410°F)
- T3 -196°C to +50°C (-320 to +122°F)
- T4 0°C to +350°C (+32 to +662°F)

### P<sub>max</sub> of Measuring Loops (see pressure rating page)

- P1 P<sub>max</sub> depends upon material (max flange rating Cl. 600 / PN100)
- P2 P<sub>max</sub> depends upon material
- P3 P<sub>max</sub> depends upon material

### Construction Type (P<sub>max</sub> @ 120°C (248°F))

- PMO Parallel manifold, P<sub>max</sub> = 128.8 bar (1869 psi)
- PFO Parallel path, seal-less
- SFO Serial path, seal-less, P<sub>max</sub> = 262 bar (3800 psi)

### Material of Wetted Parts

- M1 1.4571 (316Ti) (std.)
- M3 2.4602 (Alloy C22), seal-less construction types only
- M4 Tantalum, PFO construction type only, max. ANSI 300/PN40
- 62 1.4462 (Duplex), PFO construction type only
- 10 1.4410 (Super Duplex), PFO construction type only

### Process Connection

See mechanical construction pages for available connections and codes

### Options Codes

See options listing for specific codes

### Terminal Box Selection

- 9 Remote transmitter cable termination box (std.)
- C Enclosure for compact mount RHE16 transmitter

### Hazardous Area Certifications

- N Without Ex approval
- A ATEX approval Zone 0: Ex II 1 G Ex ia IIC T1-T6 Ga
- 2 ATEX rating Zone 2: Ex II 3 G Ex nA IIC T1-T6 Gc
- C CSA approvals USA-Canada Class I, Div. 1, Gr., A, B, C, D

### Pressure Design Compliance

- NN No specific design compliance required
- A1 PED to module A1 [Europe]
- BC PED to module B+C1 [Europe]
- CA CRN (Alberta Province) [Canada]
- CR CRN (All other Provinces) [Canada]

### Mass Flow Calibration Selection

See performance page for code options

### Density Calibration Selection

- D 1% Accuracy (std.)
- S 0.5% Accuracy



## Options

<b>H1</b>	Hot oil/steam heating matrix for housing, DN25 PN40
<b>H2</b>	Hot oil/steam heating matrix for housing, 1" ANSI 150 RF
<b>H3</b>	Hot oil/steam heating matrix for housing, 1" ANSI 300 RF
<b>P2</b>	Housing purge for dry gas – ½" NPT (2 pcs)

<b>SH</b>	Housing in 316Ti stainless steel
<b>DY</b>	Dye penetrant inspection
<b>XR</b>	X-ray test – PMO (flange) type only
<b>O</b>	Oil/grease free cleaning