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# RHM 06

## One of the Most Popular Rheonik Mass Flowmeter Serving Thousands of Worldwide Applications

The RHM 06 can measure flow rates up to 25 kg/min (55 lb/min) with temperatures in excess of 350°C and pressures up to 430 bar. This model is one of the most popular, manufactured by Rheonik, the mass flowmeter experts.



### Applications

Suitable for virtually any mass flow application, such as:

- General flow control
- Dosing
- Batching
- Injections
- Filling

- Optimised solutions for your batching operation
- Extra compact design with minimal space requirement –ideal for CNG applications–
- EEx Approvals (i.e. ATEX, CSA, ...)
- Custody Transfer Approvals (i.e. PTB, NMI, ...)

### Features

The outstanding features include:

- Suitable for pressure up to 430 bar
- Typical measuring ranges from 0.25 kg/min to 25 kg/min (55 lb/min)
- Typical flows as low as 0.15 kg/min
- Flow Accuracy of 0.10%
- Repeatability better than 0.05%

### Advantages

- No pressure effect – no deterioration of accuracy due to pressure changes by the patented Omega Shape
- Patented torsion swinger design assures longest life time and increased safety (low stress in welds and increased wall thickness against abrasion)
- No moving parts – practically no maintenance
- Removable connection block



## General

The Rheonik patent was originally based on the RHM 06. Today this is one of the most popular models in the Rheonik range of mass flowmeters. With flow measurement up to 25 kg/min and the large number of model variants available, this meter is suitable for many applications. As with all other Rheonik meters, this model is based on the patented Omega tube design with increased signal to noise ratio.

This unique design, which offers excellent performance and reliability, has created the most satisfied customers worldwide. Unlike other mass flowmeter manufacturers, Rheonik uses a patented torsion rod swinger with the Omega shape and support bars which results in high accuracy measurement, which is independent of pressure, even at very low flow velocities. The meter has also extremely good repeatability and high stability for critical applications.

# RHM 06 Specifications

## Performance RHM 06

### Max Flow 25 kg/min (55 lb/min)

Standard Models			
Rates/turndown ratio	in (kg/min)	in (lb/min)	error in % of reading
nominal rate $Q_{nom}$	20.000	44.10	0.15
$0.2 * Q_{max}$ (5:1)	5.000	11.02	0.20
$0.1 * Q_{max}$ (10:1)	2.500	5.51	0.20
$0.05 * Q_{max}$ (20:1)	1.250	2.75	0.20
$0.02 * Q_{max}$ (50:1)	0.500	1.10	0.50

Typical $\Delta P$ in bar (psi)		
1 cP	100 cP	1000 cP
1.0 (14.9)	6.0 (86.6)	58.1 (842)
0.1 (1.3)	1.4 (21.2)	14.5 (210)
~ 0 (0.4)	0.7 (10.6)	7.2 (104)
~ 0 (0.1)	0.4 (5.2)	3.6 (52)
~ 0 (0)	0.1 (2.1)	1.4 (21)

Optimized Low Flow Models <sup>(*)</sup> /optimized to be operated between $0.012 * Q_{max}$ and $0.4 * Q_{max}$			
Rates/turndown ratio	in (kg/min)	in (lb/min)	error in % of reading
$0.4 * Q_{max}$ (1:1)	10.000	22.05	0.15
$0.02 * Q_{max}$ (15:1)	0.500	1.10	0.20
$0.012 * Q_{max}$ (30:1)	0.300	0.17	~ 0.50 <sup>(**)</sup>

0.3 (4.4)	2.9 (42.6)	29 (420)
~ 0 (0)	0.1 (2.1)	1.4 (21)
~ 0 (0)	~ 0.1 (1.3)	0.8 (12)

<sup>(\*)</sup> serial/single path version offers the same accuracy at half the flow ( $Q_{max} = 12.5$  kg/min)

<sup>(\*\*)</sup> around 0.30 - 0.70 % accuracy depending on the installation conditions

Gold Line Models/application fine tuned meters			
$1 * Q_{nom}$ (1:1)	20.000	44.10	0.10
$0.1 * Q_{nom}$ (10:1)	2.000	4.41	0.10
$0.05 * Q_{nom}$ (20:1)	1.000	1.10	0.12

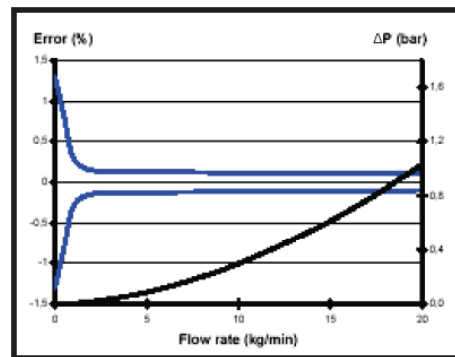
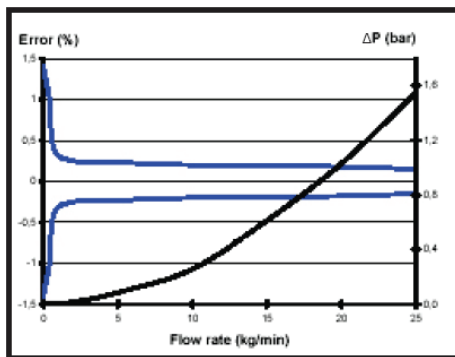
1.0 (14.9)	6.0 (86.6)	58.1 (842)
~ 0 (0.2)	0.6 (8.4)	5.8 (84)
~ 0 (0)	0.3 (4.2)	2.9 (42)

### Repeatability

better  $\pm 0.05$  % of rate

### Temperature

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



Standard Models

Gold Line Models

For serial (single pipe/path) sanitary design  $Q_{max}$  is 12.5 kg/min (50%). Data above refer to standard wall thickness.

Error of reading (including zero drift) indications refer to reference conditions  $\text{H}_2\text{O}$ ,  $18^\circ\text{C}$  to  $24^\circ\text{C}$  ( $66^\circ\text{F}$  to  $76^\circ\text{F}$ ), 1 bar to 3 bar (15 psi to 45 psi).

RHM sensor do not suffer from pressure effect due to torsional oscillation and semi circle (non-deforming) measurement section.

Temperature changes of  $\pm 25^\circ\text{C}$  around the operating point are negligible.

Pressure drop refers to Newton liquids, with parallel measuring loops and block/manifold connection.

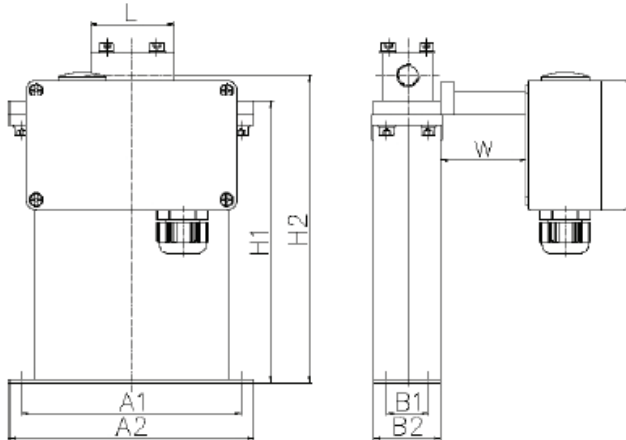
Nominal flow refers to approx. 10 m/s (33 ft/sec) velocity in measuring loops for best performance.

**Calibration to customer range, with increased accuracy, possible.**

# General Outline Dimensions RHM 06

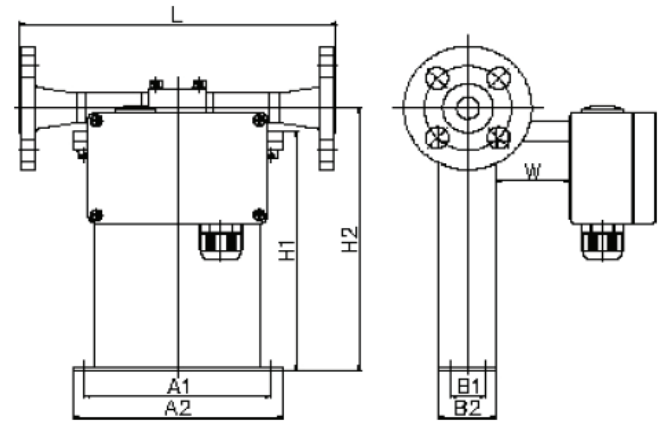
## Type I (w/removable manifold block - serial [SM0]/parallel [PM0]/PTFE seals)

Thread Type:



Weight approx. 5 kg (11 lb)

Flange Type:



Weight approx. 8 kg (18 lb)

A1=165 mm (6.50 in)    B1=40 mm (1.58 in)    H1=234 mm (9.21 in)  
 A2=180 mm (7.09 in)    B2=60 mm (2.36 in)    H2=255 mm (10.04 in)

W = 0 mm for standard temperature models -45/-20°C to 120°C (-49/-4°F to 248°F)  
 and W = 150 mm (5.91 in) for extended (ET1, ET2) and high temperature models(\*)

Process Connection	Face to Face Length (L) (**)	Order Code
<b>Thread Standard</b>		
G ½ in female	70 mm (2.76 in)	G1
NPT ½ in female	70 mm (2.76 in)	N1
<b>Thread Optional</b>		
Autoclave/(MP)	100 mm (3.94 in)	P2

<b>Flange Standard</b>	1 in CL 150 acc. ANSI B16.5	260 mm (10.24 in)	A1
	1 in CL 300 acc. ANSI B16.5	260 mm (10.24 in)	A2
	1 in CL 600 acc. ANSI B16.5	300 mm (11.82 in)	A3
	DN25/PN40 acc. DIN 2635 - C	260 mm (10.24 in)	D1
	DN25/PN100 acc. DIN 2637 - E	300 mm (11.82 in)	D2
<b>Flange Optional</b>	1 in CL 900/1500 acc. ANSI B16.5	350 mm (13.78 in)	A6
	DN25/PN160 acc. DIN 2638 - E	300 mm (11.82 in)	D3
<b>Special</b>	1 in JIS flanges	standard - 260 mm (8.67 in)	XX
	Swagelok	standard - 230 mm (9.06 in)	XX
	VCR	standard - 230 mm (9.06 in)	XX
	Novaswiss	standard - 230 mm (9.06 in)	XX

(\*) For high temperature models (HT) Type II or Type III preferred - see next pages.  
 (\*\*) Customization possible on request.

Our standard seals are PTFE - Manifold block on request available without seals but with brazed connection block.

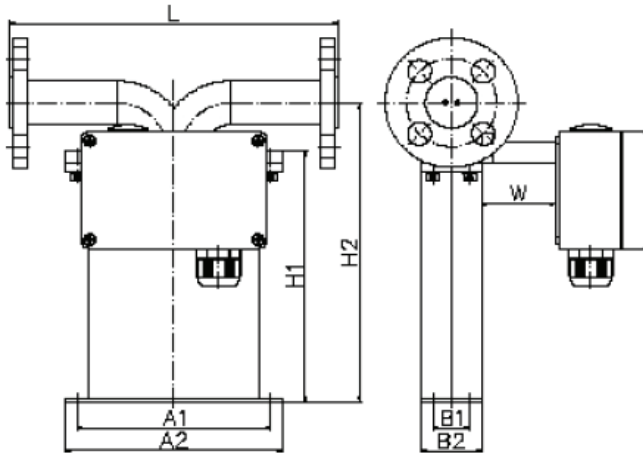
The finish type of our ANSI flanges is RF/SF (AARH 125-250 (µ in) - Ra 3, 2 up to 6, 3 (µm)). Others available on request.

Above table only shows our general process fittings.  
 For further customization with regard to face to face length and special fittings please contact your local agent.

# General Outline Dimensions RHM 06

## Type II (sealless welded, parallel measuring loops w/o seals [PF\_])

Flange Type:

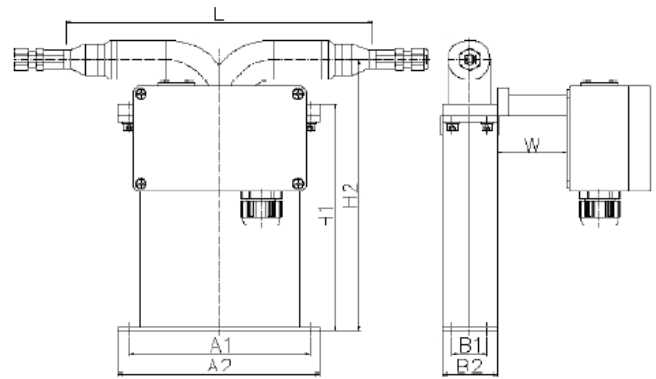


Weight approx. 8 kg (18 lb)

A1=165 mm (6.50 in)    B1=40 mm (1.58 in)    H1=234 mm (9.21 in)  
 A2=180 mm (7.09 in)    B2=60 mm (2.36 in)    H2=322 mm (12.68 in)

W = 0 mm for standard temperature models -45/-20°C to 120°C (-49/-4°F to 248°F)  
 and W = 150 mm (5.91 in) for extended (ET1, ET2) and high temperature models

Special Fittings:



Weight approx. 8 kg (18 lb)

Process Connection	Face to Face Length (L) (**)	Order Code
Standard	1 in CL 150 acc. ANSI B16.5	260 mm (10.24 in) A1
	1 in CL 300 acc. ANSI B16.5	260 mm (10.24 in) A2
	1 in CL 600 acc. ANSI B16.5	300 mm (11.82 in) A3
	DN25/PN40 acc. DIN 2527 - C	260 mm (10.24 in) D1
	DN25/PN100 acc. DIN 2527 - E	300 mm (11.82 in) D2
Optional	1 in CL 900/1500 acc. ANSI B16.5	300 mm (11.82 in) A6
	1 in CL 2500 acc. ANSI B16.5	300 mm (11.82 in) A8
	DN25/PN160 acc. DIN 2527 - E	300 mm (11.82 in) D3
Special	G ½ in female	standard - 270 mm (10.63 in) G1
	NPT ½ in female	standard - 270 mm (10.63 in) N1
	Swagelok ½ in tube inlet (SS-810-1-12W)	standard - 360 mm (14.17 in) W1
	1 in JIS flanges	standard - 260 mm (10.24 in) XX
	Grayloc or equivalent hubb	standard - 230 mm (9.06 in) XX

(\*) Customization possible on request.

The finish type of our ANSI flanges is RF/SF (AARH 125-250 (µinch) - Ra 3, 2 up to 6, 3 (µm)). Others available on request.

Above table only shows our general process fittings.

For further customization with regard to special fittings and face to face length please contact your local agent.



## General Specifications RHM 06

### Approvals

- ATEX (CESI 02 ATEX 053 X): Ex II 1 G, EEx ia IIC T6-T1
- CSA (220705) Class I, Div 1 and 2, Groups A, B, C and D; Type 3
- Custody Transfer Approvals (PTB 1.32-97027224 and NMI TC 3382)
- PED according to directive 97/23/EC available
- 3A Sanitary Approvals

### Electrical Connection

- Junction box/aluminium coated (standard) IP 65 (Nema 4X) (Junction box in SS optional)
- Cable entry M25 x 1.5 (M20 x 1.5, ½ in and ¾ in NPT optional)
- Max cable length between RHM and RHE: 100 m (330 ft) 200 m (660 ft) only with factory approval

### Housing

- Stainless Steel: 1.4301/SS 304
  - others on request -
- Protection class: IP 65 (Nema 4X)
  - higher on request -

### Material of Wetted Parts

- 1.4571/SS 316Ti (standard)
- 1.4539/SS 904L on request
- Hastelloy C22 on request
- Tantalum on request
- Other material on request

### Pressure Rating

- Pressured part of the meter consists of the measuring loops and the connection part. The weaker of both parts decides the maximum allowed operating pressure. Below is the max. operating pressure of the measuring loops(\*).

*(\*) These values are only valid for SS 316Ti & SS 904L materials. Statements for others materials on request.*

- **Standard Version:**

380 bar @ 120°C (5510 psi @ 248°F)  
300 bar @ 210°C (4350 psi @ 410°F)  
260 bar @ 350°C (3370 psi @ 662°F) wall thickness is generally 1.0 mm (0.04 in)

- **Optional low pressure loss version:**

190 bar @ 120°C (2755 psi @ 248°F) wall thickness is generally 0.5 mm (0.02 in)

- **Extremely high pressure**

- on request -

### Temperature Rating

- NT Models from -20°C to 120°C (-4°F to 248°F)
- ET Models from -45°C to 120°C (-49°F to 248°F)
- ET1 Models from -200°C to 50°C (-328°F to 122°F)
- ET2 Models from -45°C to 210°C (-49°F to 410°F)
- HT Models from 0°C to 350°C (32°F to 662°F)

# Order Code RHM 06

## Order Code Structure

The order code of the Rheonik Sensors consists of 6 sections (see previous pages/below). Restrictions of combinations may apply. For specials, please comment your needs in plain text/sketches.

### RHM 06

#### Temperature Rating

- T1** NT Models (Normal Temperature Models) from -20°C to 120°C (-4°F to 248°F)
- TA** ET Models (Extended Temperature Models) from -45°C to 120°C (-49°F to 248°F)
- T2** ET2 Models (Extended Temperature Models) from -45°C to 210°C (-49°F to 410°F)
- T3** ET1 Models (Extended Temperature Models) from -200°C to 50°C (-328°F to 122°F)
- T4** HT Models (High Temperature Models) from 0°C to 350°C (32°F to 662°F)

#### Pressure Rating

- P1** Low pressure loss version (190 bar @ 120°C/2755 psi @ 248°F) - page 6 -
- P2** Standard pressure version (380 bar 120°C/5510 psi @ 248°F) - page 6 -
- PX** Extremely high pressure version (on request) - page 6 -

#### Construction Type

- PM0** Parallel Measuring Loops with removable Block/Manifold and PTFE Seals - page 3 -
- SM0** Serial Measuring Loops with removable Block/Manifold and PTFE Seals - page 3 -
- PF\_** Parallel Measuring Loops Seal Less Welded Version - page 4 -
- SF0** Serial Measuring Loops Seal Less Welded Version/Single Path - page 5 -
- XXX** Other construction type on request

#### Material of Wetted Parts

- M1** 1.4571/SS 316Ti
- M2** 1.4539/SS 904L
- M3** Hastelloy C22
- M4** Tantalum

#### Process Connection

- XX** Code available on pages 3, 4 and 5.

#### Hazardous Area Approvals

- NN** Without Ex Approvals
- AT** ATEX Approvals (CESI 02 ATEX 053 X) - Ex II 1 G, EEx ia IIC T6-T1
- CS** CSA Approvals (220705) - Class 1, Div 1/Group A, B, C, and D; Type 3

RHM 06 [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]

## Order Code Example

### M#06 T1 P2 PM0 M1 G1 AT

- T1:** NT (Normal Temperature Models) from -20°C to 120°C (-49°F to 248°F)
- P2:** Standard pressure version (380 bar @ 120°C/5510 psi @ 248°F)
- PM0:** Parallel Measuring Loops with removable Block/Manifold and PTFE Seals
- M1:** 1.4571/SS 316 Tipart
- G1:** Female Thread G ½ in
- AT:** ATEX Approvals (CESI 02 ATEX 053 X)

M #06 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]



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