

## The World's Largest Range of Mass Flowmeters



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## General Introduction

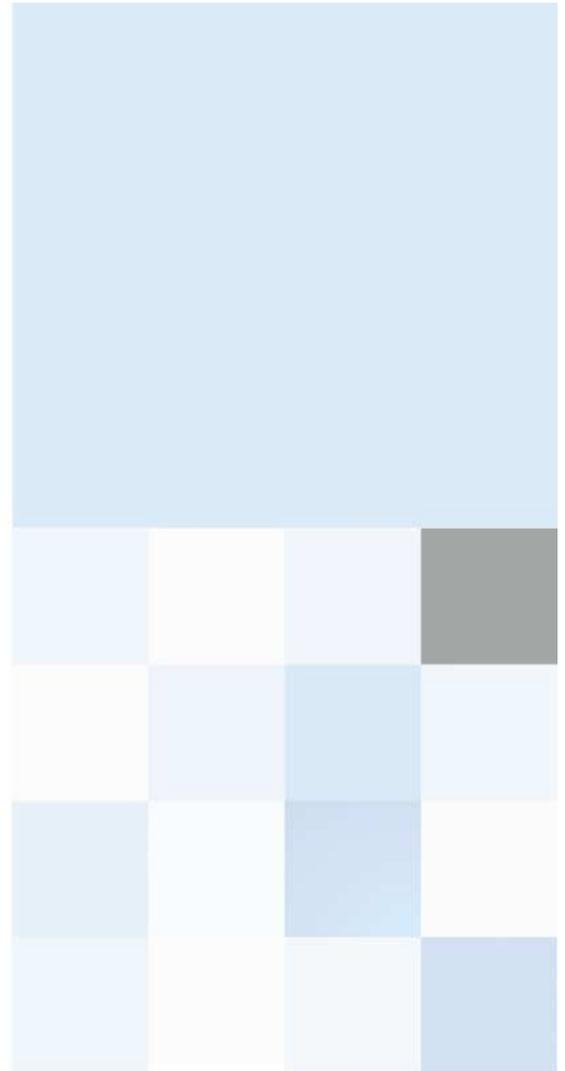
Rheonik Messgeräte GmbH has more than twenty years of experience in the field of Coriolis Mass Flowmeter design and development.

Beginning in 1984, Karl Küppers began the design of a mass flowmeter based upon the Coriolis effect that later became the patented Omega tube Coriolis Mass Flowmeter manufactured by Rheonik today.

After the exhaustive testing of many different designs, the Omega tube meter with torsion rods and mass bars was granted a patent based upon its unique operation and construction feature. Compared to other meter designs, the Rheonik Omega tube design offers outstanding performance and mechanical reliability.

Rheonik was founded in 1986 by Mr. Küppers to commercially produce the Rheonik Mass Flowmeter range. Based initially in the town of Maisach near Munich, the company grew quickly due to the widespread success of the Rheonik design in the field. To accommodate increased demand, Rheonik Messgeräte GmbH relocated to a modern facility in Odelzhausen with increased production and office space.

Today, Rheonik manufactures the largest range of Coriolis mass flowmeters in the world for customers in more than 30 countries. With more than twenty years experience in the field, Rheonik Messgeräte GmbH is one of the world leaders of Coriolis Mass Flowmeter development and manufacture.



Rheonik Messgeräte GmbH, Germany

The Coriolis effect was discovered by physicist Gustave Gaspard Coriolis during the 1830's, and is described as "the inertial force exerted on an object as a result of movement relative to a rotating frame of reference." This science has been applied to many technologies: hydraulics, machine performance, missiles, ergonomics, ocean and atmospheric circulation and, of course, mass flow metering.

The use of the Coriolis effect as a technique for liquid and gas mass flow measurement was firmly established over 20 years ago. Since then, a number of different designs have been produced. With the tremendous electronic signal processing technology advances that have been made, Coriolis mass flowmeters have become highly accurate and reliable instruments. Rheonik remain at the forefront of this technology and now produce the world's largest and most comprehensive range of meters. Only the Rheonik range has all of the following features:-

- *Liquid, sludge and gas measurement capability*
- *Models to measure flow rates from as low as 0.03 kg/h up to 1,500,000 kg/h (0.07 lb/h to 3,300,000 lb/h)*
- *Sizes up to 12" / DN300*
- *Pressure ratings up to 900bar / 13,050psig*
- *Temperature ratings from -255°C to +400°C / -425°F to +750°F*
- *Fiscal/custody transfer approvals (OIML R117 / NTEP)*
- *ATEX and CSA hazardous area approvals covering most of the world*
- *Extreme resistance to gas bubbles entrained in the process stream when compared to conventional Coriolis meters*
- *Unaffected by viscosity, density or pressure changes*
- *Multifunction measurement capability includes density and temperature*
- *Available with stainless steel, hastelloy, monel and tantalum wetted materials as standard. Other materials on request*

At the factory and in regional offices, Rheonik maintains a team of expert application and service engineers, offering best fit technology identification and specification all the way through to on-site commissioning and in-depth application troubleshooting and resolution. A factory trained sales and service network provides local service and support worldwide.

The Rheonik range with its unique Omega tube design allows the most challenging mass flow metering applications to be solved. The Omega tube has a torsional oscillation movement rather than the bending motion associated with other, more conventional Coriolis meter designs. The unique mechanical arrangement of the Omega tube meter allows the use of tubing with heavier wall thickness giving higher pressure ratings, combating abrasion and erosion and eliminating the requirement for the secondary pressure containment found with conventional designs.



*Coriolis in action at an olive oil canning factory*

*Highly accurate truck filling station with RHM 60 FNT for custody transfer*



The flexibility of the Rheonik range in terms of applicability and accuracy is due to the patented mechanical arrangement of each meter. Each flowmeter has two measuring tubes parallel to one another and formed into the unique Omega shape, oscillating in opposing directions.

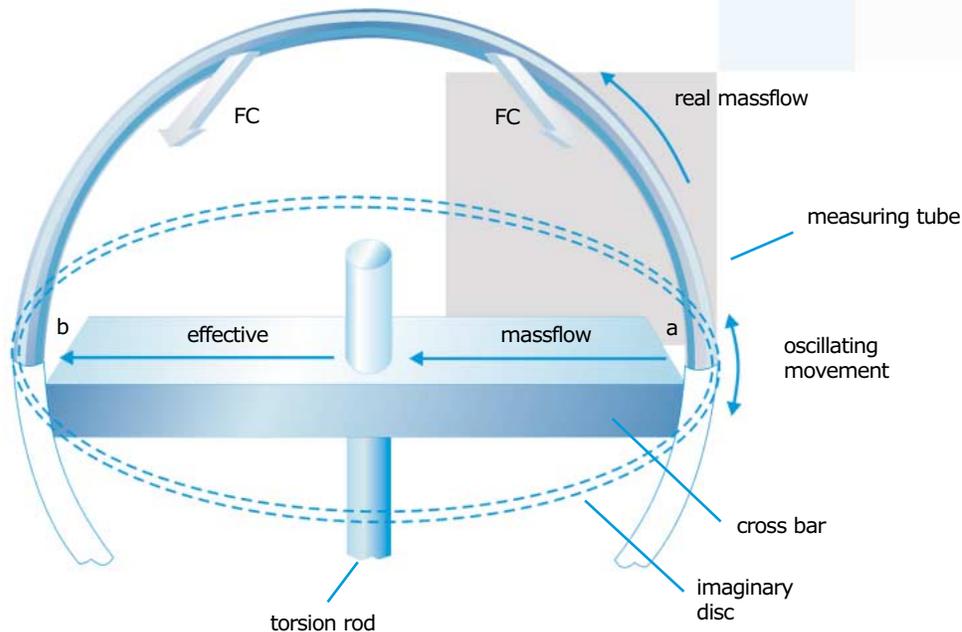
The oscillating system is driven with two high mass cross bars mounted on vertical torsion rods:-

- i) The high mass cross bars stabilize the torsional movement, either eliminating or greatly reducing interference from external vibration and providing continued, reliable operation with the presence of oscillation dampening factors such as entrained gas bubbles or non-homogeneity in the process stream.
- ii) The torsion rods minimize stress on the tubing, guide tube movement and help "energize" the torsional motion.

This rugged mechanical arrangement is energy conserving and requires very little power input (typically less than 300mW) to maintain oscillation amplitude. The design provides for an exceptionally well balanced mechanism that approaches perpetual motion once energized, with a natural frequency that is tuned by the mass of the cross bars and the elasticity of the torsion rods.

Amplitude is controlled by a pair of electromagnetic coils mounted at each side of the Omega tubes. The whole mechanism is symmetrical, ensuring that internal acceleration forces from the measured process are counterbalanced. Whenever mass (either liquid or gas) flows through the oscillating Omega shaped tubes, a Coriolis force is generated, causing a "bending" or "deflection" in the top of the tubes. This deflection is sensed as a phase shift between two electronic pick ups mounted on the tubes. The degree of phase shift is directly proportional to the mass flowing within the tubes.

This can perhaps be better understood by imagining that the oscillation of the meter measuring tubes (the upper semi-circle of the Omega tubes) is taking place on an imaginary disc with points "a" and "b" on the circumference of the disc. Process material, starting at point "a" and moving across the imaginary disc to point "b" (the path of "effective massflow") will pass through a range of differing velocities along the way. The Coriolis force ("FC") generated from the oscillations of the disc and the effective mass flow vector is perpendicular to the movement of the mass across the disc and is proportional to the mass flow. In the meter, this force causes the deflection that is sensed by the two pick-up coils.



The Omega tube Coriolis meter is one of the most versatile meters available on the market today. The Rheonik range contains the widest variety of sizes, optimized to give accurate and reliable performance without compromise and addressing requirements from extremely low flows of 0.001kg/min / 0.002 lb/min to 25,000 kg/min / 55,100 lb/min at the upper end.

The robust mechanical design of the Omega tube meter lends itself to extreme applications other meter designs cannot be used in. Rheonik meters can be used for processes with temperatures as low as -255°C / -425°F, as high as 400°C / 750°F and with pressure requirements up to 900 bar / 13,050 psig. All meters are available for use in hazardous areas, certified to EEx ia IIC/EEx de IIC or Class 1, Div 1, Gr. ABCD and many can be supplied with globally recognized approvals for custody transfer applications. Wetted parts can be manufactured from exotic materials, including Hastelloy and Tantalum for processes that have specific material compatibility requirements.

Unlike conventional Coriolis designs, Rheonik meters can be made with thick wall tubing to address concerns of wear and failure in abrasive or corroding applications. The pressure ratings of Omega tube meters are consequently much higher, removing the requirement of secondary containment pressure housings commonplace in other Coriolis meters.

Rheonik meters are universally applicable to hundreds of different process measurements in many different industries:

- *Liquid oxygen flow metering (fig. 1)*
- *Pilot plant (fig. 2)*
- *High pressure CO<sub>2</sub> / O<sub>2</sub> / N<sub>2</sub> / H<sub>2</sub>*
- *First liquid hydrogen filling station*
- *Asphalt blending station (bitumen at 363°C / 685°F)*
- *High accuracy filling station - custody transfer (fig. 3)*
- *HCL metering using large Tantalum meters (fig. 4)*
- *High temperature metering solutions (fig. 5)*



fig. 1



fig. 2



fig. 3



fig. 4



fig. 5

All Rheonik Coriolis mass flow meters are manufactured to strictly controlled procedures and quality standards.

Vacuum brazing is used for the final assembly of Rheonik Omega tube meters. Each meter is closely inspected to ensure all joints are sound and defect free. Meters with removable cases are sealed with an O-ring, creating an IP65 / NEMA 4X joint preventing the ingress of foreign material into the housing. Process connections can be either a removable manifold style or welded directly to the Omega form tubing to create a truly sealless meter, ideal for processes with hazardous materials.

The pick-up coils and drive coils installed in the meter are constructed of polyimide insulated wire encapsulated in epoxy resin. High temperature versions have ceramic insulated wiring. Depending upon the size of the meter, up to four PT-100 temperature sensors are installed in the meter for temperature compensation.

There are three main parts to Rheonik's patented Omega tube meter, each of which has a distinct function. When added together, they ensure that the meter produces accurate and repeatable results (see facing page for additional details):-

## Omega Form



- Design permits increased tube wall thickness
- Active measurement section is entire top half of omega tube and totally decoupled from the process piping
- No deformation of half round measurement section with changing pressure gives repeatable measurement
- Requirement for secondary pressure containment eliminated!

## Patented Torsion Rod

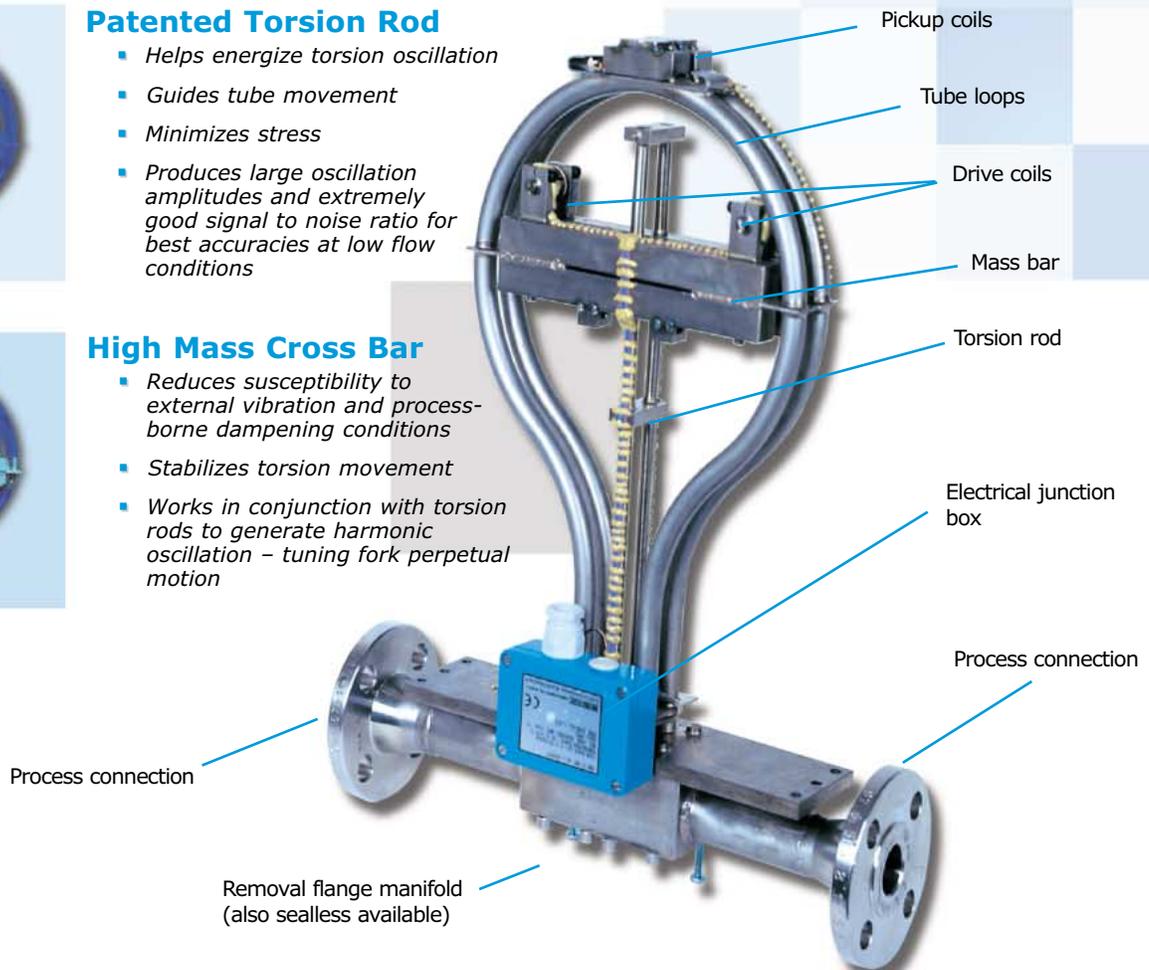


- Helps energize torsion oscillation
- Guides tube movement
- Minimizes stress
- Produces large oscillation amplitudes and extremely good signal to noise ratio for best accuracies at low flow conditions

## High Mass Cross Bar

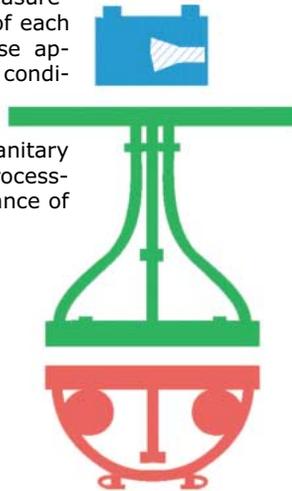


- Reduces susceptibility to external vibration and process-borne dampening conditions
- Stabilizes torsion movement
- Works in conjunction with torsion rods to generate harmonic oscillation – tuning fork perpetual motion



### Process connection block

Only Rheonik sensors can be supplied with a detachable process connection block that is independent from the rest of the sensor. The block allows for meters to be supplied with a wide range of process connections and possibilities, allowing adaptation to existing pipe. This adaptability is just one more innovation found in the Rheonik range. The process connection blocks are available in two configurations, one for parallel connection of the measuring tubes and one for serial connection. These two variants double the measurement range capability of each meter size and increase applicability to process conditions. The serial configuration is ideal for very low flow rates, sanitary applications and for processes where there is a chance of blockage.



### Process Feed Tubes

After process material has entered the meter through the connection block, it enters the Omega form and flows through the process feed tubes. This part of the sensor is designed to condition the flow from the connection block into the measuring tubes above the high mass cross bars. Oscillation movement is spread across the tubes in a torsional moment, minimizing stress and ensuring maximum sensor stability.

### Measuring Tubes

Only the half circle (the measuring tube) at the top of the Omega form is used for the mass flow measurement. The two measuring tubes are driven in a rotary motion by the oscillation system. It is a characteristic feature of the Rheonik range that the measuring tubes themselves are not directly driven and remain in the same position in relation to the oscillating motion of the sensor. This indirect drive ensures the measuring tubes are dedicated solely to measuring mass flow, free from the influence of ambient factors or process conditions.

## Omega Form Advantages

### Increased Wall Thickness

The unique torsional drive movement of the Omega tube design allows the Rheonik range to have the thickest tube walls of any Coriolis principle meter currently available. This is advantageous in high pressure applications and where corrosion or the effects of abrasion are a cause for concern. The rotary oscillation motion eliminates the bending forces created by other designs; it is these bending forces that are the limiting factor on the wall thickness of conventional Coriolis meter designs. There is no requirement for secondary pressure containment housings on Rheonik meters as internal tubing has a wall thickness at least equal to that of the connected pipework. The thicker wall tubes make the meter piping impervious to changing pressure conditions giving the best possible stability of measurement in dynamic conditions.

### Large Active Measurement Section

The entire top half of the omega tube is used for measurement, resulting in relatively large movement of the measurement plane and high signal amplitudes that give unrivalled sensitivity. Careful design has ensured that the active measurement section is located away from the meter process connections where

heat dissipation and vibration do not present any problems to the measurement. The semi-circular shape is also highly resistant to deformation from process pressure, a source of inaccuracy and instability with other tube shape designs.

### Torsional Movement

The torsional movement of the meters in the Rheonik range clearly distinguishes them from other Coriolis meter designs and the patented Omega tube arrangement is the key to robustness of this measurement technique. External vibration is most often in one plane (i.e. horizontal or vertical) and almost never rotational. Consequently, Rheonik meters see very little effect from vibration and give an accurate, stable output where other meters fail.

### Density

Many meters in the Rheonik range are available with process density output as a secondary measurement. Calculation of density is derived from the base oscillation frequency – the heavier the process stream density, the lower the base oscillation frequency and vice versa. Along with temperature output, Rheonik meters provide multifunction capability for added value.

### General Description/Data:

Type	Typical measuring range <sup>(2)</sup>		Nominal rate	Pressure rating in psig <sup>(7)</sup>	Standard process connections	
	Parallel (lb/min)	Serial (lb/min)			For temperatures up to 248°F	Threaded <sup>(1,3)</sup>
RHM015 <sup>(4)</sup>	0.01 - 1.32 <sup>(5)</sup>	0.005 - 0.66 <sup>(5)</sup>	1.32	4350 (5800)	1/4" NPT	1/2" / DN15
RHM03	0.22 - 11	0.11 - 5.5	11	4350 (2175)	1/4" NPT	1/2" / DN15
RHM04	0.44 - 22	0.22 - 11.0	22	2175 (3625)	1/4" NPT	1/2" / DN15
RHM06	1.1 - 55	0.55 - 27.5	44	5510 (2755)	1/2" NPT	1" / DN25
RHM08	2.3 - 110	1.15 - 55	110	4205 (13050)	1/2" NPT	1" / DN25
RHM12	4.5 - 220	2.25 - 110	165	2755 (4205)	3/4" NPT	1" / DN25
RHM15	9 - 440	4.5 - 220	330	2175 (4350)	3/4" NPT	1" / DN25
RHM20	13 - 660	6.5 - 330	660	1595 (3260)	1" NPT	2" / DN50
RHM30	33 - 1650	16.5 - 825	1322	1885 (5800)	--	2" / DN50
RHM40	66 - 3300	33 - 1650	2756	1770 (3625 <sup>(6)</sup> )	--	3" / DN80
RHM60	130 - 6610	65 - 3305	5512	1450 (2900 <sup>(6)</sup> )	--	4" / DN100
RHM80	350 - 17635	175 - 8820	11025	1450 (2320 <sup>(6)</sup> )	--	6" / DN150
RHM100	530 - 26455	--	22050	1450 (3190 <sup>(6)</sup> )	--	8" / DN200
RHM160	1100 - 55115	--	50715	580 (870 <sup>(6)</sup> )	--	12" / DN300

- (1) ISO G threads available
- (2) Typical range for standard meter. Special ranges available
- (3) Different sizes available
- (4) Types RHM007 / 01 replaced by RHM015
- (5) Optional fine tuning: parallel 0.005 - 1.32 lb/min serial 0.0025 - 0.66 lb/min
- (6) Maximum pressure rating of tube.
- (7) Pressure rating (in brackets) refers to optional heavy duty or special versions

**For the selection of the most suitable meter for your application, including assessment of pressure drop, please contact us with full process details.**

#### Accuracy:

Standard Models	
Range 1:20	±0.20% of rate or better
Range 1:50	±0.50% of rate or better
Repeatability	Better than ±0.10% of rate
Optional Gold Line Models fine tuned to your application	
Range 1:10	±0.10% of rate or better*
Range 1:20	±0.12% of rate or better*
Repeatability	Better than 0.05% of rate*

\*Not all models are available with optional Gold Line performance – please consult factory

**Accuracy and Repeatability (including zero drift)** are stated at a reference condition of H<sub>2</sub>O, 14.7psig, 68°F. Range is turn down from nominal flow rate. Optional special calibration and fine tuning for enhanced accuracy in customer specified ranges (including low flow) is available.

#### General Technical Specifications:

<b>Pressure rating</b>	Ratings stated in the table above refer to meter tubes up to 120°C / 248°F. Pressure ratings are lower for meters with higher temperature range. Most meters are available with higher pressure ratings – please consult factory for details.			
<b>Temperature range</b>	RHM type	Temp. in °F	Temp. in °C	Temp. Class (for EEX ia IIC version)
Normal	NT	-4 to +248	-20 to +120	T4 – T6
Extended 1	ET1	-328 to +122	-200 to +50	T6 (Ex approval for T> -45°C only)
Extended 2	ET2	-49 to +410	-45 to +210	T2 – T3
High	HT	32 to 662	0 to 350	T1 – T3
Very high	VHT	32 to 752	0 to 400	No EEx approval
<b>Wetted materials parts</b>	Standard material of construction is 316Ti / 1.4571 Stainless Steel. Optional materials include Hastelloy, Tantalum, Monel and Inconel. Consult factory for others. PTFE is used in meters requiring seals.			

The above tables are a summary of the standard meter range. Special and custom version meters are available on request. All hazardous area meters carry ATEX and/or CSA/NRTL approvals. All standard versions comply with EU PED and ASME standards.

## General Description:



### RHE 14

DIN Rail Mounting IP20 / NEMA 1 Housing  
 Power Supply: 8 to 24Vdc  
 Dimensions: 70 x 86 x 58mm /  
 2.8 x 3.4 x 2.3"  
 Safe area mounting  
 Optional safety barrier for hazardous area  
 sensor installation and profibus in development



### RHE 06/06F+ ATEX

Wall mounting coated alloy housing  
 Protection class: IP64  
 Power supply: 230 / 115 VAC  
 Dimensions: 200 x 200 x 110mm  
 RHE06F+ has PTB/OIML custody transfer  
 approval



### RHE 07 Panel Mount Transmitter (ATEX, CSA)

Rack version (1/3 19" - 28TE/HP 3HE/U)  
 Protection class: IP20 / NEMA 1  
 Power supply: 230 / 115 VAC, 24 VDC  
 Dimensions: 142 x 128 x 250mm /  
 5.6 x 5 x 9.8"



### RHE 08 Field Mount Transmitter (ATEX, CSA)

Wall mounting coated alloy housing  
 Protection class: IP65 / NEMA 4 / Cl. 1, Div. 1,  
 Gr. ABCD  
 Power supply: 230 / 115 VAC, 24 VDC  
 Dimensions: 207 x 148 x 302mm /  
 8.1 x 5.8 x 11.9"



### RHE 11 Field Mount Transmitter ATEX

SS housing for wall, pipe or meter mounting  
 Protection class: IP66 / EEx d IIC T5  
 Power supply: 230 / 115 VAC, 24 VDC  
 Dimensions: 244 x 225 x 200mm /  
 9.6 x 8.9 x 7.9"



### RHE 12 Field Mount Transmitter ATEX, CSA

Wall, pipe or meter mounting  
 Pressure safe housing (coated alloy)  
 Protection class: IP66 / EExd IIC T5 / Cl. 1,  
 Div. 1, Gr. ABCD  
 Power supply: 24 VDC  
 Dimensions: diameter 115mm / 4.5"  
 height 200mm / 7.9"  
 User Interface:  
 LCD display  
 2 Button Operation

The RHE14 is low cost, compact and ideal for OEM applications. I/O includes 4-20mA, pulse, flow direction and RS232 serial data. Programming and configuration by SensCom™ software.

The RHE06 is ATEX approved for hazardous area installation and offers pulse output and Error and Flow Direction. \*The RHE06F+ has double pulse outputs with 90° phase shift for custody transfer applications.

All other Rheonik transmitters have clear, easy to read local displays and intuitive, menu driven set-up and configuration functions. All include diagnostics for fault finding and tuning. Features include low flow cutoff, response time, multiple I/O, selectable units and full scaling capabilities. All settings are stored in non-volatile memory and I/O is galvanically or optically isolated.

### RHE 07/08/11

- Programming:** Programmable via 3 buttons
- Analogue outputs:** 2 assignable and scalable 0/4-20mA for flow, density, temperature or volume, galvanically isolated, max. load < 500 Ohm
- Digital outputs:** 1 frequency / pulse output (0-10kHz, max. 30V / 50mA), 3 status outputs (limit, error / alarm, flow direction etc.)
- Digital inputs:** 2 status inputs (remote zero, hold totalizer, tot. reset, quit error/alarm)
- RS232/422/485:** Serial interface or HART options available. For details see individual datasheet.
- Display:** 2 line, 16 character backlit LCD display
- Features:** Includes built-in single and dual stage batch controller

RHE07C has double pulse output for custody transfer

### RHE 12

- Programming:** Programmable via 2 sensors behind the glass cover
- Analogue outputs:** 1 programmable 0/4-20 mA output, galvanically isolated (intrinsically safe optional)
- Digital outputs:** 1 frequency / pulse output (intrinsically safe optional), HART  
Error / Alarm condition output (22 mA)  
RS232 / 485 options available
- Display:** 2 line, 16 character backlit LCD display

*Profibus PA / Foundation Fieldbus in development*

## General Data for all Transmitters:

Ambient temperature: -40 to 60°C  
 Power consumption:  
 RHE12 < 5 Watt  
 RHE14 < 1 Watt

RHE 06, RHE 06F+, RHE07, RHE 08 and RHE 14 transmitters to be installed outside of hazardous area (RHE 08 can be installed in Cl. 1, Div. 2 area).  
 RHE 11/12 can be installed in the hazardous area.  
 RHM can be installed in hazardous area (ATEX EEx ia IIC T6-T1 / CSA Cl. 1, Div.1, Gr. ABCD) if connected to approved RHE unit.

CLIENT	MEDIA
AMEC / BP MAGNUS PROJECT	HYDROCARBON
AMEC/BP E4 PROJECT/FOXBORO	WATER
AMERADA HESS	LNG
BAYER	TEST
BP / PALPRO	SCALE INHIBITOR, H <sub>2</sub> S SCAVANGER CORROSION INHIBITOR
BRAN & LUEBBE UK	SCALE INHIBITOR WATER BREAKER
CANNON VIKING	HCL SOLUTION POLYOL MIX
CELOTEX	POLYMER
CELTIC	CATALYST
DALLING AUTOMATION	ISOCYANATE, POLYOL
DEVRO-TEEPAK	VEGETABLE DYE, GLUTERALDEHYDE
DOW CORNING	HYDROGEN, DPR (LIQUID) CHLOROSILANES, WATER SILOXANE HC1
DOW KVAERNER	20% HCL/WATER
ENICHEM	GAC13L
EUROPEAN VYNLS CORP	HCL/VCM/EDC, ORGANICS CRUDE EDC
FIRESTONE	POLYOL, ISOCYANATE
GENERAL ELECTRIC	NATURAL GAS
GREAT LAKES CHEMICALS	BROMINE
IMPERIAL COLLEGE, LONDON	LIQUID NITROGEN, LIQUID PROPANE

JACOBS MONTELL / SHELL	CATALYST SLURRY
JORDAN KENT METERING SYSTEM	HYDROCARBON COND.
KINGSPAN IRELAND	WATER & HCL
KINGSPAN UK	SULFURIC ACID 58%, PHENOLIC RESIN
KVAERNER / SINOPEC INT	ACETIC ACID, PARAXYLENE SLURRY
MARATHON OIL	METHANOL
NRC BOTT	FREON 22
OMS	ISOCYANATE POLYOL
PHARMACIA & UPJOHN, CORK	DICHLOROMETHANE, ACETONE, DMSO, ETHO-ORTHO-FORMATE, HYDROGEN BROMIDE, ACETONE, DMSO
PHILLIPS PETROLEUM / JADE	SCALE INHIBITOR METHANOL
PILKINGTON TECHNOLOGY	WATER & ORG SOLVANT
SHELL OFFSHORE	CONDENSATE
SLP	MONOETHYLENE GLYCOL
TARGOR	ALUMINIUM TRIETHYL
TOTAL FINA ELF	BITUMEN
UNI F. BEECHAMS	SUPERCRITICAL CO <sub>2</sub> , BROMINE, LIQUID COOLANT, NITROGEN, HCL 20%



Contact:	<input type="text"/>	Qty. of meters:	<input type="text"/>
Company:	<input type="text"/>	Delivery date:	<input type="text"/>
End user/location:	<input type="text"/>	Telephone no.:	<input type="text"/>
Address:	<input type="text"/>	E-Mail address:	<input type="text"/>

## Application Data

Tag No:	<input type="checkbox"/> Liquid	<input type="checkbox"/> Gas	
Process medium:	<input type="text"/>		
	Minimum	Normal	Maximum
Flow rate <input type="checkbox"/> kg/min or <input type="checkbox"/> lbs/min			
Viscosity at process temperature <input type="checkbox"/> cP or <input type="checkbox"/> cSt			
Operating pressure <input type="checkbox"/> bar or <input type="checkbox"/> psi			
Operating density <input type="checkbox"/> kg/m <sup>3</sup> or <input type="checkbox"/> lbs/gal			
Process temperature <input type="checkbox"/> °C or <input type="checkbox"/> °F			
Max. allowable pressure drop <input type="checkbox"/> bar or <input type="checkbox"/> psi			

**FLOW BY**  Centrifugal pump \_\_\_\_\_ Tr/min  Piston pump \_\_\_\_\_ Strokes/min  Gravimetric  Others

(If not listed below, please specify) \_\_\_\_\_

Please specify type of industry i.e. plastic industries \_\_\_\_\_

Please specify purpose of measurement

- General flow control  
  Filling process  
  Custody transfer  
  Flow detection/flow switch  
 Dosing  
  Else \_\_\_\_\_

## Flow Sensor Requirements

Process connection  Flange/Threads \_\_\_\_\_  Others \_\_\_\_\_  
 Material of wetted parts\*  **1.4571/316 Ti**  (1.4539/904L)  Hastelloy C22  Tantalum  
\*please note that RHEONIK takes no responsibility for the choice of material  
 Others \_\_\_\_\_  
 Construction design  Parallel tubes (std)  Single path  Sanitary  
 Area classification  Safe  Hazardous  
 Distance sensor-transmitter \_\_\_\_\_ Meters/Feet Transmitter in safe area?  Yes  No

## Transmitter Requirements

Supply voltage  230 VAC +/- 10%  115 VAC +/- 10%  24 VDC +/- 10%  
 Output/interfaces  4/20 mA  Impulse (1-10 kHz)  HART  
 RS 232  RS 422/485  
 Display/totaliser  Yes  No  
 Mounting  Wall mount  Panel mount  Others \_\_\_\_\_

## Comments

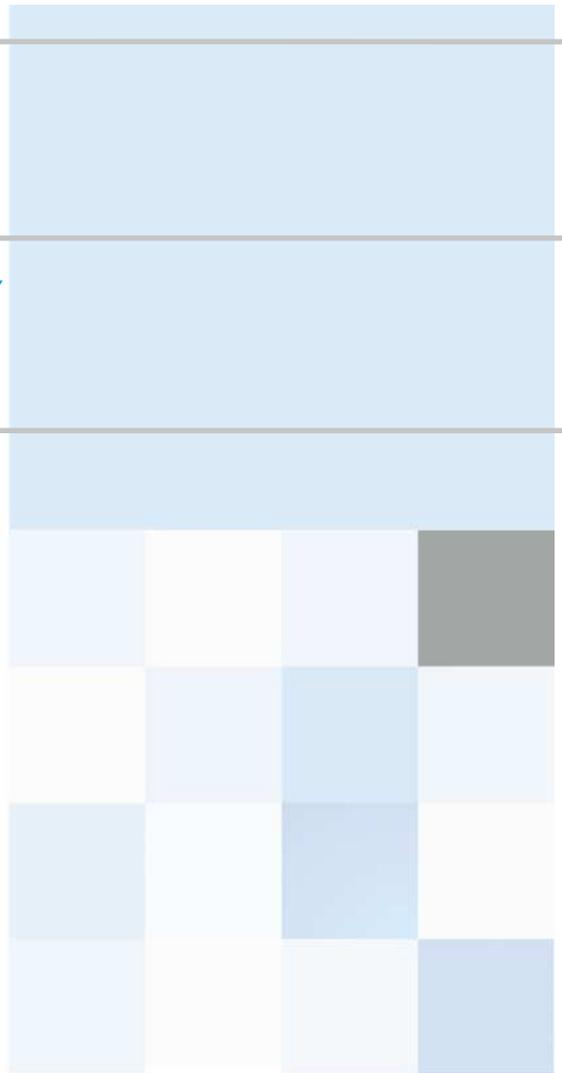
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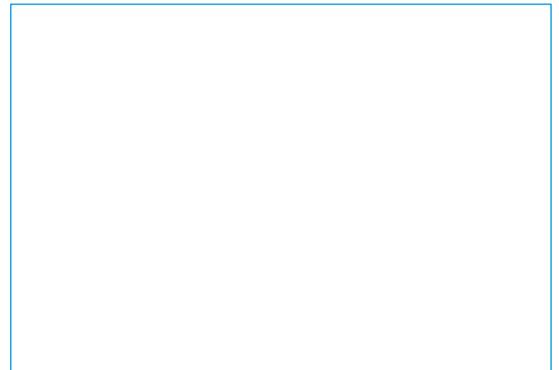
*The world's  
largest range  
of mass flowmeters*

*No other design  
offers such versatility  
and rangeability*

*Worldwide  
distribution  
and service*



Represented by:-



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