

High Performance Coriolis Mass Flowmeter for Low Flow Applications



measuring
•
monitoring
•
analyzing

HPC

Transmitter
UMC4



HPC



- Measuring Range:
2...20 to 5...50 kg/h
- Accuracy
Liquids: $\pm 0.1\%$ of Reading
Gases: $\pm 0.5\%$ of Reading
Density: $\pm 0.005 \text{ g/cm}^3$
Volume: $\pm 0.2\%$ of Actual
- p_{max} : PN400 (5,800 PSI)
- t_{max} : $-40...180^\circ\text{C}$ ($-40...350^\circ\text{F}$)
- Connection:
 $\frac{1}{2}$ " NPT female, G $\frac{1}{2}$ Female,
Gyrolok®/Swagelok® 6/8/10/12 mm
- Material:
Stainless Steel, Aluminum
- Features:
Vibration Resistant, Rugged Flow
Body, Wall Mounting or Desk-top
Versions



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Description

The HPC is built on the coriolis principle where mass flow, density and temperature are simultaneously measured to accurately determine volumetric flow. When measuring very low flow rates with a coriolis meter, it has been common practice to use a single pipe model. However, traditional models with just one measuring pipe are more subject to the influence of external interferences, often necessitating a costly decoupling.

The HPC delivers a unique dual bent tube measuring system, where the sensor coils are mounted between the tubes, instead of directly on them. This provides the sensor with a significantly noise-reduced and predictable dynamic behavior, capable of working at higher frequencies, and also further removes the sensor from external vibrations.

With these characteristics, the HPC delivers both high accuracy and excellent resistance to external interferences. It is ideally suited to deliver low flow measurement for many fluids in a variety of applications. HPC mass flow sensors are only available with a remote transmitter.

Features

- Precise Measurements for Very Low Ranges
- Vibration Resistant
- Very Rugged Flow Body
- Modular Housing/Mounting Concept

Technical Details

Sensor

Process Connection:	½" NPT Female, G ½ Female, Gyrolok®/Swagelok® 6/8/10/12 mm
Nominal Pressure:	PN 100/PN 320/PN 400 (1,450/4,640/5,800 PSI)
Process Temperature:	-40...180 °C (-40...350 °F)
Ambient Temperature:	-20...60 °C (-4...140 °F)
Density	
Liquid:	Max. 2 kg/l
Gas:	Min. 0.002 kg/l (in Operating State)
Viscosity:	0.3...2,000 cP (Depending on Inlet Pressure)
Explosion Proof:	ATEX 19ATEX2096X BV/IECEX CML19.0025X
Standard:	II 1 G/II 1 D Ex ia IIC T4 Ga/Ex ia IIIC T135 °C Da, T _{amb} -40 ... +60 °C
High Temperature:	II 1 G/II 1 D/II 2 D Ex ia IIC T4-T2 Ga/Ex ia IIC T135 °C Da/Ex ia IIC T190 °C/T240 °C Db, T _{amb} -40 ... +60 °C IP 65 (EN60529)
Protection:	
Materials	
Measuring Pipes:	316-Ti Stainless Steel
Flow Body:	316L Stainless Steel
Secondary Containment:	Aluminum, Stainless Steel
Measuring Ranges	
HPC-S01:	2...20 kg/h ΔP @ Q _{max} = 0.8 bar
HPC-S02:	5...50 kg/h ΔP @ Q _{max} = 0.20 bar
	Reference conditions: acc. IEC 770: water @ 20 °C

Accuracy

Liquids:	± 0.1 % of Actual ± Zero Stability
Gases:	± 0.5 % of Actual ± Zero Stability
Density (Liquids):	± 0.005 g/cm³ incl. Density Calibration
Volume:	± 0.2 % of Actual ± Zero Stability (Dependent on Transmitter)

Zero Stability: ± 0.02 % of Q_{max}

CE-Marking: EMV Guideline 2004/108/EG
EN 61000-6-3:2001 Interference Emission
EN 61000-6-2:1999 Interference Immunity
Ex Guideline 94/9/EG

Electrical Conn.: Plug ODU Mini-Snap®, IP68 [up to 80 °C (76 °F) Process Temp.]
Plug Harting HAN® R23 [100 - 180 °C (212 - 350 °F) Process Temp.]
Cable: 8 Pole c/w Plug

Transmitter

Model:	UMC4
Material:	Aluminum (Painted)
Mounting:	Remote Mounted
Power Supply:	19 - 36 V _{DC} , 90 - 265 V _{AC}

Outputs: Galvanically Isolated
ATEX/IEC-Ex: II(1)2G Ex d [Ia Ga] IIC T3-T4 Gb (Terminal Compartment Ex d), T_{amb}: -20...60 °C

Analog Output: 2 x 4-20 mA, Passive (for Ex Intrinsically Safe or not Intrinsically Safe)

Communications: HART®
Analog Output 1: Mass Flow, Volume Flow, Density, Temperature

Analog Output 2: Mass Flow, Volume Flow, Density, Temperature

Binary Output 1: Adjustable as Pulse or Frequency Output

Pulse Output: Pulse Width: Standard 50 ms
Adjustable from 0.1...2000 ms
Pulse-break Value 1:1 if Adjusted
Pulse Time Falls Short

Pulse-value Adjustments: 1 Pulse/unit
Adjustable from 0.001-100.0 (in Increments of Ten of the Selected Pulse Unit)

Frequency Output Adjustments: Max. 1 KHz
Passive, via Optocoupler,
U_{max} = 30 V
I_{max} = 60 mA



Technical Details Continued: UMC-4 Transmitter

As Binary Output 2: for Forward Flow, Backward Flow, MIN/MAX Flow

As Status Output: MIN/MAX Density, MIN/MAX, Temp. Alarm, Second Pulse Output (90° Phase Shifted), Passive via Optocoupler, $U_{max} = 30\text{ V}$, $I_{max} = 60\text{ mA}$

Order Details Flowmeter HPC (Example: HPC-S 01 4020 10 A 1 P 0 1 1 0 H)

Model/ Wetted Parts	Measuring Range/ Sensor	Process Connection	Nominal Pressure	Sensor Housing
HPC-S = Flow Body 316L Stainless Steel, Measuring Tubes 316-Ti Stainless Steel	..01.. = Measuring Range 2...20 kg/h, Sensor 1.5 mm ..02.. = Measuring Range 5...50 kg/h, Sensor 2 mm	..4020.. = G ½ Female, Installation Length 150 mm	..10.. = PN 100 (1,450 PSI) ..32.. = PN 320 (4,640 PSI) ..40.. = PN 400 (5,800 PSI)	..A.. = Aluminum Anodized [up to 120 °C (248 °F) Temperature of Media] ..C.. = Stainless Steel [up to 180 °C (356 °F) Temperature of Media]
		..6030.. = ½" NPT Female, Installation Length 150 mm		
		..6140.. = 6 mm Swagelok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..6150.. = 8 mm Swagelok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..6160.. = 10 mm Swagelok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..6170.. = 12 mm Swagelok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..8140.. = 6 mm Gyrolok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..8150.. = 8 mm Gyrolok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..8160.. = 10 mm Gyrolok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		
		..8170.. = 12 mm Gyrolok®, via Adaptor, Stainless Steel, Installation Length 150 mm + ~60 mm		

Order Details Flowmeter HPC (Continued)

Mounting Style	Sensor Configuration/ Process Temperature/ Connection to Sensor	Approvals
..1.. = Pipe, Direct Mount in Piping, No Additional Fixation ..2.. = Wall Mount (Incl. Wall Mount) ..3.. = Desk Mount for Gas - Measuring Tubes Top-mounted (Incl. Holder for Placing on Flat Surfaces) ..4.. = Desk Mount for Liquids - Measuring Tubes Bottom-mounted, (Incl. Cradle for Placing on Flat Surfaces)	..P.. = Remote Mount Transmitter / -40...176 °F (-40...80 °C) / ODU Mini Snap®, IP 68 ..Q.. Remote Mount Transmitter / -40...350 °F (-40...180 °C) / ODU Mini Snap®, IP 68	..0.. = Without
	..R.. = Remote Mount Transmitter (ATEX) / -40...176 °F (-40...80 °C) / Connector (Harting Han® R 23), IP 66 ..L.. = Remote Mount Transmitter (ATEX) / -40...350 °F (-40...180 °C) / Connector (Harting Han® R 23), IP 66	..L.. = ATEX/IEC-Ex: "II 1G Ex ia IIC T4 .. T2 Ga" and "II 1D Ex ia IIIC T 135 °C Da"

Order Details Flowmeter HPC (Continued)

Calibration Mass-flow	Calibration Density	Supplementary Equipment	Design
..1.. = Standard, 3-point	..1.. = Standard (3-point)	..0.. = Without	..H = Heinrichs
..2.. = 10-point	..2.. = Special Calibration (5-point)	..X.. = With (Separate Specification Necessary)	..K = KOBOLD



High Performance Coriolis Flowmeter for Low Flows Model HPC

Order Details Transmitter UMC4 (Example: UMC4- E 1 1 A 0 0)

Model	Mounting/Electrical Connection to Sensor/ Conduit Port	Display/ Interface Board	Power Supply	Output Signal
UMC4-	..E.. = Remote Transmitter Incl. 5m Cable, w/o Junction Box/ M20x1.5 ^{1) 2)} ..D ³⁾ .. = Remote Transmitter with Junction Box/ M20x1.5 ^{1) 2)}	..1.. = Integral -20...60 °C (-4...140 °F)	..1.. = 90 -265 V _{AC} , 50/60 Hz ..2.. = 19-36 V _{DC}	..A.. = Analog Output 1: 4-20 mA with HART® Protocol Analog Output 2: 4-20 mA Pulse Output: Passive U _m =30 V _{DC} Status Output: Passive U _m =30 V _{DC}

¹⁾ Incl. Wall and Pipe Mount Kit (2")

²⁾ Cable Glands to be Ordered Separately

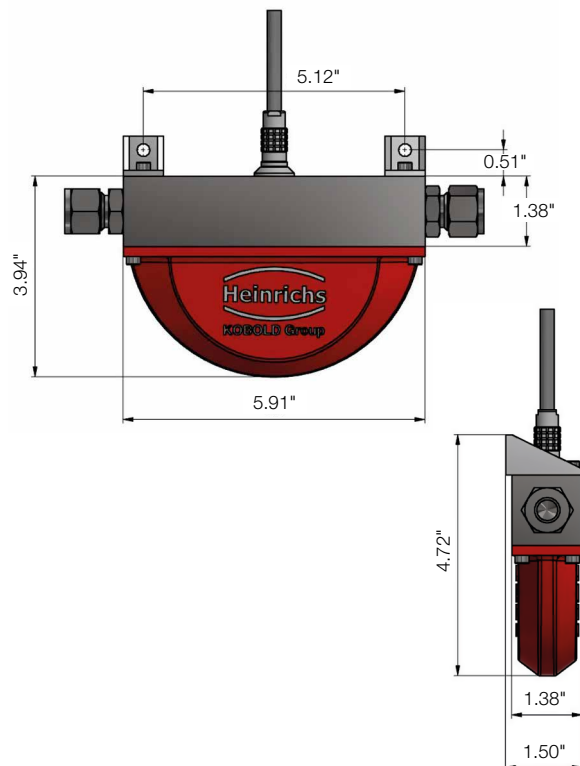
³⁾ Add-on Price per m Cable for Option "D" (Please Specify Cable Length when Ordering)

Order Details Transmitter UMC4 (Continued)

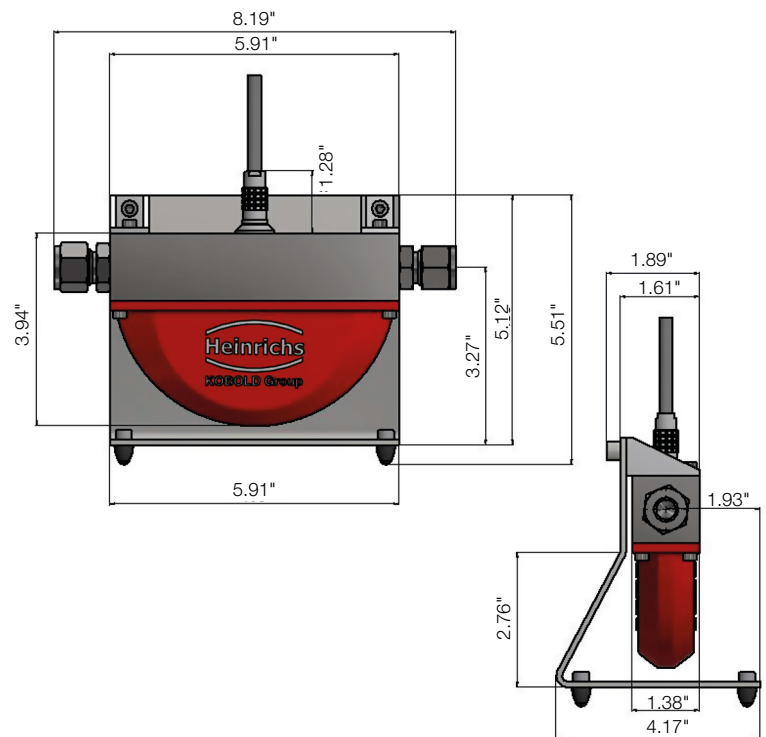
Approvals	Protection Type for Signal Output
..0.. = without ..2.. = II(1)2G Ex d [ia Ga] IIC T3-T4 Gb (Protection Class Connection Room Ex d), T _{amb} -20...60 °C	..0 = Without (ONLY without Approval) ..1 = Ex ia ..2 = Not Intrinsically Safe

Dimensions

Inline and Wall Mounting

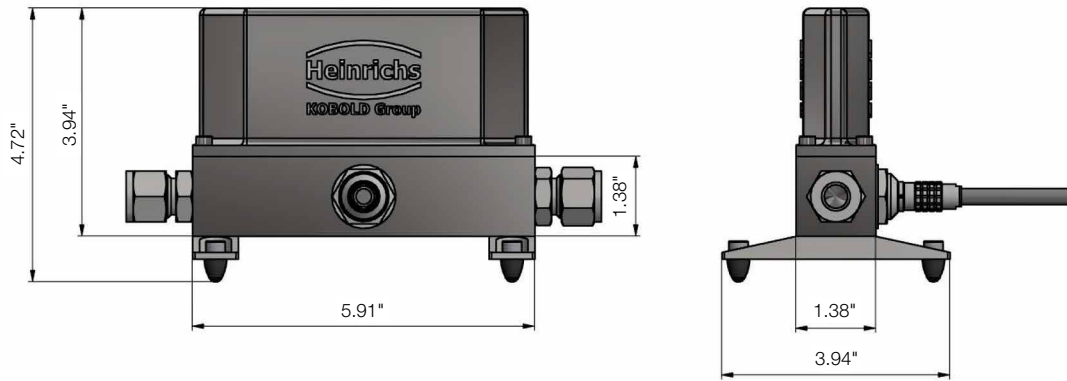


Desk Version with Measuring Pipes Pointing Downwards

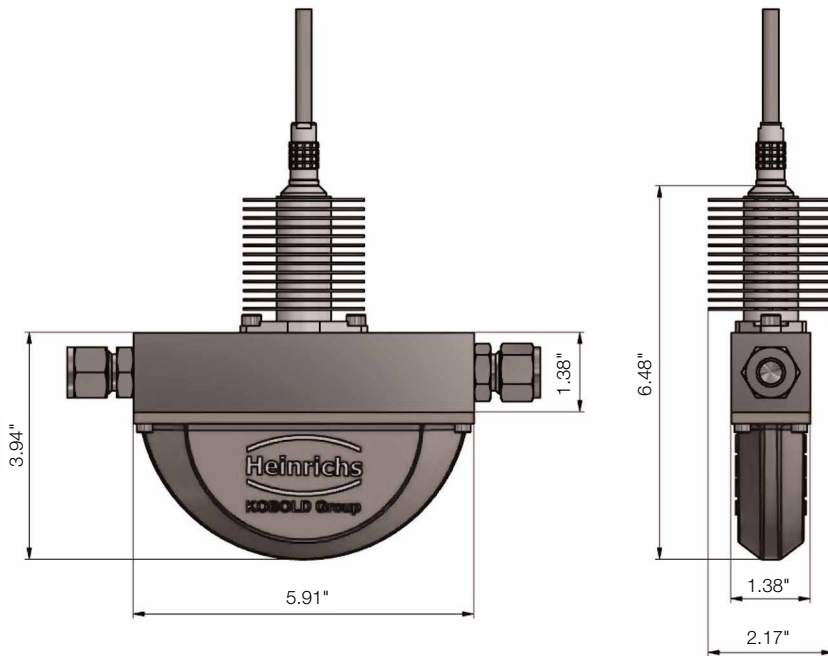


Dimensions (Continued)

Desk Version with Measuring Pipes Pointing Upwards



High Temperature Version



Weight

Model	DN	Sensor	Transmitter (UMC4)
		lbs (kg)	lbs (kg)
HPC-S01	½" NPT Female	4.0 (1.8)	9.9 (4.5)
HPC-S02	½" NPT Female	4.0 (1.8)	