Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

# High Performance Coriolis Mass-Flowmeter

for LOW FLOW applications

measuring • monitoring • analysing

## HPC


- Measuring range:
  0-20 … 0-160 kg/h
- Accuracy:
  liquids ±0.1 % of reading
  gases ±0.5 % of reading
  density ±0.005 g/cm³
  volume ±0.2 % of actual
- $p_{max}$: PN 400
- $t_{max}$: -40 … +180 °C
- Connection:
  ½" NPT female, G ½ female,
  Gyrolok®/Swagelok®
  6/8/10/12 mm
- Material:
  stainless steel, aluminium
- Features:
  vibration resistant, very robust flow body, wall mounting, desk-version


S5

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## Application

For the measurement of very small flow rates it is common practice to use single pipe coriolis flow meters. However, with the use of just one measuring pipe the influence of external interferences increases dramatically, often necessitating a costly decoupling. The HPC uses a dual bent pipe measuring system. Furthermore the sensor coils are not mounted on the measuring pipes anymore rather than between the pipes. This provides the sensor with a significantly noise-reduced and predictable dynamic behavior, capable of working at higher frequencies, so further decoupling the sensor measurement from external vibrations.

With these characteristics the HPC coriolis sensor is therefore not only extremely accurate, but also particularly resistant against external interferences. The sensor is therefore very suited for very low flow measurements for all applications for nearly all liquids.

## Function

The coriolis mass flow meter HPC is working acc. the coriolis principle. Mass Flow, density and temperature are being measured simultaneously. The volume flow can be calculated out this measurements. HPC mass flow sensors are only available with remote transmitter.

## Features

- Precise measurements for very small measuring ranges
- Vibration resistant
- Very robust flow body
- Variable housing and mounting concept

## Technical Details

### Sensor

| | |
|---|---|
| Process connection: | ½" NPT female, G½ female, Gyrolok®/ Swagelok® 6/8/10/12 mm |
| Nominal pressure: | PN 100/PN 320/PN 400 |
| Process temperature: | -40 °C … +180 °C |
| Ambient temperature: | -20 °C … +60 °C |
| Explosion proof: | ATEX 19ATEX2096X BV/IECEx CML 19.0025X<br>**Standard**<br>II 1 G/II 1 D Ex ia IIC T4 Ga/Ex ia IIIC T135 °C Da, $T_{amb}$ -40 … +60 °C<br>**High temperature**<br>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<br>$T_{amb}$ -40 … +60 °C |
| Protection: | IP 65 (EN60529) |

### Materials

| | |
|---|---|
| Measuring pipes: | 1.4571 (316 TI) |
| Flow body: | 1.4404 (316 L) |
| Secondary containment: | aluminium, stainless steel |

### Measuring ranges

| | | |
|---|---|---|
| HPC-S01: | 0-20 kg/h | ΔP @ $Q_{max}$ = 0.8 bar |
| HPC-S02: | 0-50 kg/h | ΔP @ $Q_{max}$ = 0.20 bar |

Reference conditions: acc. IEC 770: water @ 20 °C

### Accuracy

| | |
|---|---|
| Liquids: | ±0.1 % of actual ± Z.S. |
| Gases: | ±0.5 % of actual ± Z.S. |
| Density (liquids): | ±0.005 g/cm³ incl. density calibration |
| Volume: | ±0.2 % of actual ± Z.S. (dependant of transmitter) |
| Zero stability: | ±0.02 % of $Q_{max}$ |
| CE-Marking: | EMV-guide line 2004/108/EG<br>EN 61000-6-3:2001 interference emission<br>EN 61000-6-2:1999 interference immunity<br>Ex-guide line 94/9/EG |
| Electrical conn.: | plug ODU Mini-Snap®, IP 68 (up to 80 °C process temp.)<br>plug Harting HAN® R23 (100 - 180 °C process temp.)<br>cable: 8 pole c/w plug |

### Transmitter

| | |
|---|---|
| Model: | UMC4 |
| Material: | aluminium (painted) |
| Mounting: | remote mounted |
| Power supply: | 19 - 36 $V_{DC}$,<br>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),<br>$T_{amb}$: -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<br>Pulse-break value 1:1 if adjusted pulse time falls short |





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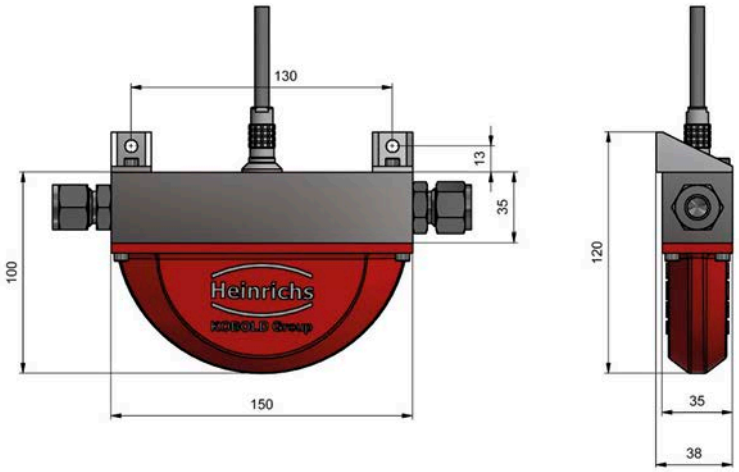
**Technical Details** (cont'd)

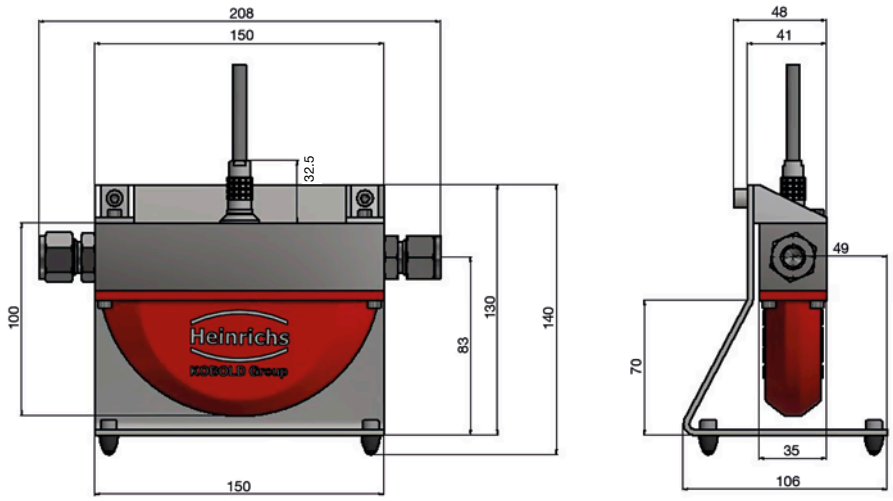
| | |
|---|---|
| Pulse-value adjustments: | 1 pulse / unit<br>adjustable from 0.001-100.0<br>(in decade steps of the selected pulse unit) |
| Frequency output adjustments: | max. 1 KHz<br>passive, via optocoupler,<br>$U_{max}$ = 30 V<br>$I_{max}$ = 60 mA |
| As binary output 2: | for forward flow, backward flow, MIN/MAX flow, |
| As Status output: | MIN/MAX density, MIN/MAX, temp. alarm<br>second pulse output (90 ° phase shifted)<br>passive, via opto coupler,<br>$U_{max}$ = 30 V<br>$I_{max}$ = 60 mA |

**Dimensions [mm]**

**Inline- and wall mounting**

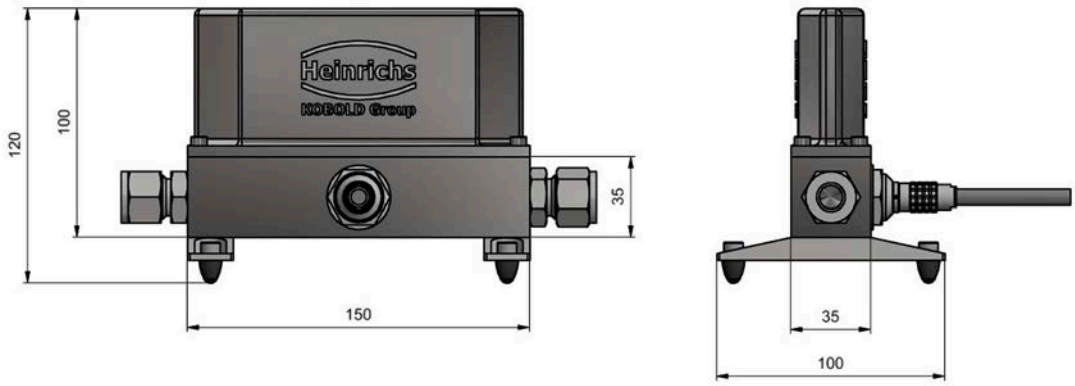



**Desk version, meas. pipes pointing downwards**

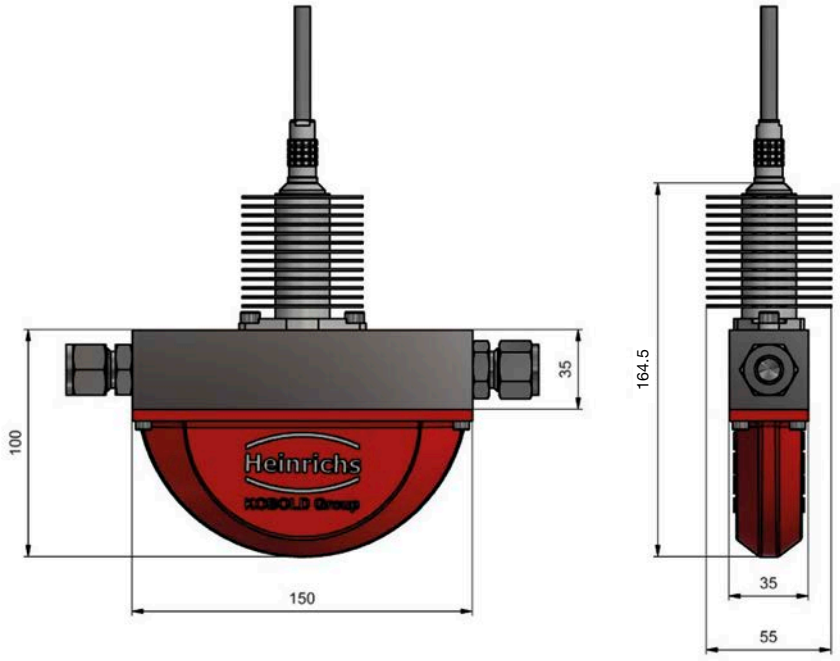


**Dimensions [mm]** (cont'd)

**Desk version, meas. pipes pointing upwards**




**High temperature version**




**Weight**

| | | Weight | |
|---|---|---|---|
| | | Sensor | Transmitter (UMC4) |
| **Model** | **DN** | kg [lbs] | kg [lbs] |
| HPC-S01 | ½" NPT female | 1.8 [4.0] | 4.5 [9.9] |
| HPC-S02 | ½" NPT female | 1.8 [4.0] | |





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**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 stainless steel 1.4404 (316L), measuring pipes stainless steel 1.4571 (316ti) | **01** = measuring range 0-20 kg/h, Sensor 1.5 mm<br>**02** = measuring range 0-50 kg/h, Sensor 2 mm | - | **4020** = G ½" female, installation length 150 mm<br>**6030** = ½" NPT female, installation length 150 mm<br>**6140** = 6 mm Swagelok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**6150** = 8 mm Swagelok®, via adaptor stainless steel, Installation length 150 mm + ~60 mm<br>**6160** = 10 mm Swagelok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**6170** = 12 mm Swagelok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**8140** = 6 mm Gyrolok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**8150** = 8 mm Gyrolok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**8160** = 10 mm Gyrolok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**8170** = 12 mm Gyrolok®, via adaptor stainless steel, installation length 150 mm + ~60 mm<br>**XXXX** = special on request, via adaptor | - | **10** = PN 100<br>**32** = PN 320<br>**40** = PN 400<br>**XX** = special on request | **A** = aluminium anodised, up to 120 °C temperature of medium<br>**C** = stainless steel, up to 180 °C temperature of medium |

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

| Mounting style | | Sensor configuration / process temperature / connection to sensor | Approvals | |
|---|---|---|---|---|
| **1** = pipe, direct mounted in piping, no additional fixation<br>**2** = wall mount, including wall mounting<br>**3** = desk mounting (gases) - measuring tubes top-mounted, incl. holder for placing on flat surfaces<br>**4** = desk mounting (liquids) - measuring tubes bottom-mounted, incl. cradle for placing on flat surfaces | - | **P** = remote mount transmitter / -40° to +80 °C (-40 °F to 176 °F) / ODU Mini Snap®, IP68<br>**Q** = remote mount transmitter / -40° to +180 °C (-40 °F to 356 °F) / ODU Mini Snap®, IP68 | **0** = without | - |
| | | **R** = remote mount transmitter (ATEX) / -40° to +80 °C (-40 °F to 176 °F) / connector (Harting Han® R 23), IP66<br>**L** = remote mount transmitter (ATEX) / -40° to 180 °C (-40 °F to 356 °F) / connector (Harting Han® R 23), IP66 | **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** (Example: **HPC-S 01-4020-10 A 1-P 0-1 1-0-H**) (cont'd)

| Calibration mass-flow | Calibration density | | Supplementary equipment | | Design |
|---|---|---|---|---|---|
| **1** = standard, 3-point<br>**2** = 10-point<br>**X** = customer specified | **1** = standard (3-point)<br>**2** = special calibration (5-point)<br>**X** = customer specified | - | **0** = without<br>**X** = with (separate specification necessary) | - | **H** = Heinrichs<br>**K** = Kobold |

**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. 5 m cable, w/o junction box / M20x1.5 [1) 2)]<br>**D**[3)] = remote transmitter with junction box / M20x1.5 [1) 2)] | **1** = integral -20 … +60 °C | **1** = 90-265 $V_{AC}$, 50/60 Hz<br>**2** = 19-36 $V_{DC}$, 24 $V_{AC}$ (+5 % - -20 %), 50/60 Hz | **A** = analog output 1: 4-20 mA with HART®-protocol<br>analog output 2: 4-20 mA<br>pulse output: passive $U_m$ = 30 $V_{DC}$<br>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 in clear text)

**Order Details Transmitter UMC4** (Example: **UMC4- E 1 1 A 0 0**) (cont'd)

| Approvals | Protection type for signal output |
|---|---|
| **0** = without<br>**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)<br>**1** = Ex ia<br>**2** = not intrinsically safe |



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