



Coriolis Mass Flow Meter

For high pressure and hydrogen dispenser applications, up to 1000 bar

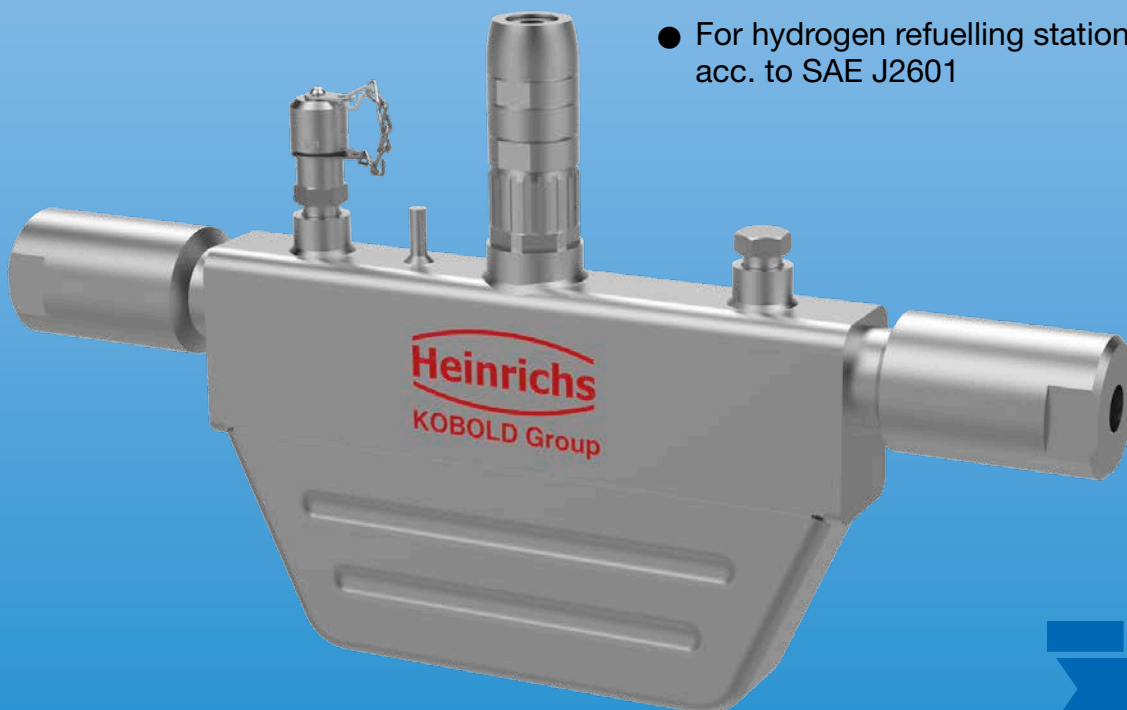


measuring
•
monitoring
•
analysing

TMU-W



- Outstanding accuracy
- Robustness against vibrations
- Working pressure up to 1000 bar
- Measuring ranges up to 960 kg/h
- OIML R139:2018 approval
- For hydrogen refuelling stations acc. to SAE J2601



SS

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Function

The TMU-W product line was specially developed for hydrogen filling applications for dispensing stations.

During fuelling process, extremely high zero point and long term stability are required.

Its special design provides the highest possible stability and unrivalled measuring accuracy to the user.

Special materials and sophisticated engineering design methods such as FEM, CFD, FSI etc. were used to fulfil this task.

Optimized for use in slim hydrogen dispensers of the latest state-of-the-art generation.

Technical Details

Sensor system: TMU-W
Coriolis dual-pipe design
TMU-W004, TMU-W006

Accuracy

Liquid: 0.1 % of actual flowrate
± ZP stability

Gas: 0.5 % of actual flowrate
± ZP stability

OIML R139:2018: Class 2 (only TMU-W004)

Wetted parts: 316Ti/1.4571

Process connection: 6MF 9/16-18 UNF
optional: 1/2" NPT (f), Hofer 7/8"

Sensor containment: 1.4301 stainless steel

Ambient temperature: -40 °C...+80 °C
-40 °F...+176 °F
(acc. to OIML R139: -40°C...+55°C)

Process temperature: -50 °C ...+60 °C
-58 °F...+212 °F
(acc. to OIML R139: -40°C...+55°C)

Process pressure: TMU-W004: max. 1000 bar
TMU-W006: max. 500 bar

Ingress protection: IP67 (EN 60529) / NEMA 6

Certificates and Approvals

ATEX / IECEx / UKCA: II 1/2G Ex ia IIC T2...T6 Ga/Gb

NEPSI: Ex ia IIC T2...T6 Ga/Gb

OIML: R139:2018



Available Transmitters UMC4 / UMC4-RM

Transmitter mounting: Field housing
 Remote mounted via junction box (½"NPT(f), M20x1,5) or connector (Harting Han® R23). IP67 (EN60529) / NEMA6
 Rack mount design (RM) remote via screw terminals. IP20 (to be mounted in min. IP54 ATEX certified protective cabinet)

Ambient temperature: -20 °C ... +60 °C (acc. to OIML R139: -40°C...+55°C)

Power supply: 90...265 V_{AC}, 50/60 Hz (not for OIML R139)
 19...36 V_{DC}

Outputs:

Each output circuit is galvanically isolated from each other as well as to ground.

Analogue: 1x 4...20 mA, passive, with HART®
 1x 4...20 mA, passive
 Mass flow, volume flow, temperature.

Binary: passive via optocoupler
 Pulse duration: 50 ms
 adjustable range 0,1...2000 ms

Status: passive via optocoupler
 Forward-/Reverse, MIN/MAX flow rate, MIN/MAX temperature, alarm, second pulse output (phase shifted to pulse 1 by 90°).

Certificate and Approvals for UMC4 / UMC4-RM



Field housing:

ATEX / IECEx: II (1)2G Ex d [ia Ga] IIC T4-T3 Gb
 NEPSI: Ex db [ia Ga] IIC T4/T3 Gb
 Terminal compartment: Ex d

- Type of protection signal output:
- Ex [ia Ga] intrinsically safe
 - non-intrinsically safe



Rack mount design (RM):

ATEX / IECEx: II (1)3G Ex ec [ia Ga] IIC T6..T3 Gc
 (to be mounted in min. IP54 ATEX certified protective cabinet)

- Type of protection signal output:
- Ex [ia Ga] intrinsically safe
 - non-intrinsically safe

Measuring ranges:

TMU-W004: max. 4 kg/min H₂ (P_{nom} 1000 bar), with OIML R139:2018 approval
 TMU-W006: max. 16 kg/min H₂ (P_{nom} 500 bar)



Necessary data for the sizing of the meter

Medium: _____

	Nominal	Minimum	Maximum	Unit
Flow rate:	_____	_____	_____	_____
Process pressure <input type="checkbox"/> abs. / <input type="checkbox"/> gauge.	_____	_____	_____	_____
Process temperature:	_____	_____	_____	_____
Density: (at process condition)	_____	_____	_____	_____
Viscosity: (at process condition)	_____	_____	_____	_____

Order Details Sensor (Example: TMU-W004 6010 A 00 J 0 1 0 0 K)

Model	Wetted materials / Measuring range / P _{Nom}	Process connection / Installation length / P _{Nom}	Sensor containment
TMU-	W004 = Stainless steel 316TI / 14571 / 4 kg/min H ₂ / 1000 bar	6010 = ¼" NPT (f) / 347 mm / 500 bar 6030 = ½" NPT (f) / 347 mm / 500 bar 4550 = Hofer 7/8" / 347 mm / 500 bar 4500 = 6MF 9/16-18 UNF / 347 mm / 1000 bar XXXX= Special, customer specified	A = Stainless steel (1.4301) Overpressure blow out, N ₂ filling nozzle, N ₂ filled
	W006 = Stainless steel 316TI / 14571 / 16 kg/min H ₂ / 500 bar ²⁾	6010 = ¼" NPT (f) / 400 mm / 500 bar 6030 = ½" NPT (f) / 400 mm / 500 bar 4550 = Hofer 7/8" / 400 mm / 500 bar 4500 = 6MF 9/16-18 UNF / 400 mm / 500 bar XXXX= Special, customer specified	

Heating / Cooling	Transmitter mounting / Process temperature / Electrical connection	Approvals
00 = without	J = Remote mounted transmitter (IP67) / -50...60 °C (-58...140 °F) / Connector (Harting Han® R 23) K = Remote mounted transmitter (IP67) / -50...100 °C (-58...212 °F) / Connector (Harting Han® R 23) ²⁾ X = Special, customer specified	0 = without L = ATEX / IECEx / UKCA II 1/2G Ex ia IIC T2...T6 Ga/Gb B = NEPSI Ex ia IIC T2...T6 Ga/Gb

Calibration flow	Calibration density	Supplementary equipment	Design
1 = Standard, 3-point 3 = External lab 7 = OIML R139:2018. Hydrogen ¹⁾ X = Special, customer specified	0 = without	0 = without 1 = Certificate of compliance with the order 2.1 2 = Test report 2.2 B = Inspection certificate 3.1 with material certificate (DIN EN 10204:2004) X = Special, customer specified	K = Kobold

¹⁾ Must be used with approved UMC4 transmitter for system approval.

²⁾ Not for OIML R139:2018. Hydrogen.

Order Details Transmitter (Example: UMC4-E11A00K)

Model	Mounting / Conduit port opening	Display / interface board	Power supply
UMC4-	<p>E = remote mount, without junction box , Transmitter with 5 m cable / M20 x 1,5 ¹⁾</p> <p>D = remote mount, with junction box / M20 x 1,5 ¹⁾</p> <p>F = remote mount, via screw terminals, rack mount version / without</p>	<p>1 = Integral within transmitter housing, for ambient temperature up to 60 °C</p>	<p>1 = 90...265 V_{AC}, 50/60 Hz ³⁾⁴⁾</p> <p>2 = 19...36 V_{DC}, 24 V_{AC} (+5%...-20%), 50/60 Hz</p>

Outputs	Approvals	Type of protection (signal output)	Design
<p>A = Analogue output 1: 4 ... 20 mA with HART®</p> <p>Analogue output 2: 4 ... 20 mA</p> <p>Pulse output: passive</p> <p>Status output: passive</p>	<p>0 = without</p> <p>2 = ATEX, IECEx II (1)2G Ex d [ia Ga] IIC T4-T3 Gb NEPSI Ex db [ia Ga] IIC T4/T3 Gb terminal compartment Ex d / -20...60 °C ³⁾</p> <p>3 = ATEX, IECEx II (1)3G Ex ec [ia Ga] IIC T6..T3 Gc Rack mount design / -20...55 °C ²⁾</p>	<p>0 = Without Approval ⁵⁾</p> <p>1 = Intrinsically safe Ex [ia Ga]</p> <p>2 = Not intrinsically safe</p>	<p>K = Kobold</p>

In the table are only options listed, which are relevant for the use of the UMC4 transmitter with a TMU-W sensor.

¹⁾ Includes mounting bracket for wall and 2" pipe.

²⁾ Only for option F

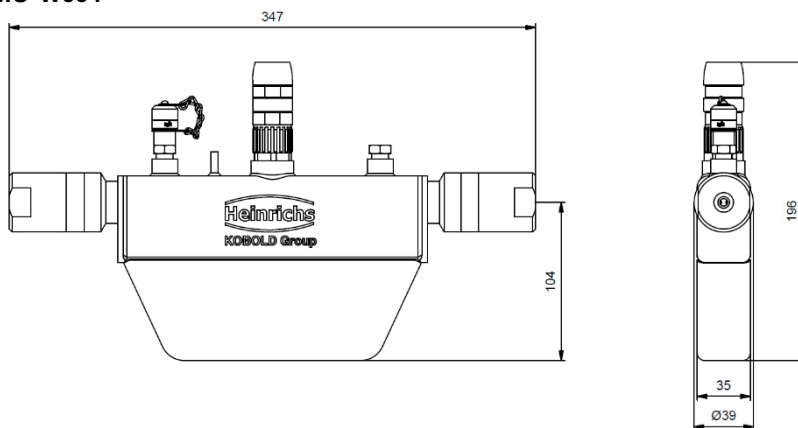
³⁾ Not for option F

⁴⁾ Not for OIML R139:2018 (TMU-W)

⁵⁾ Only for approval "0"

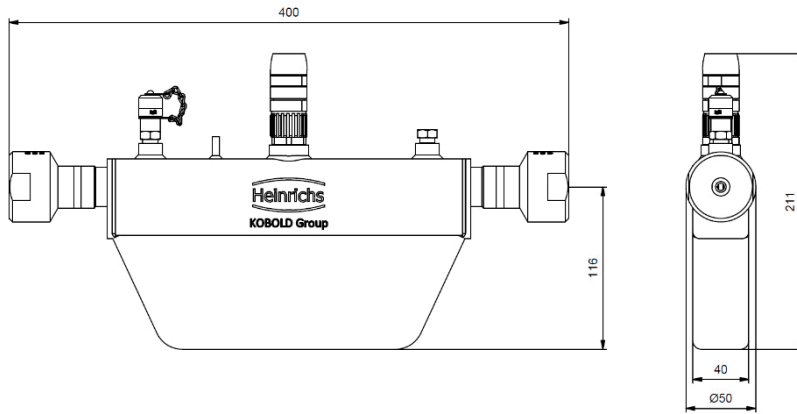
Dimensions [mm]

TMU-W004

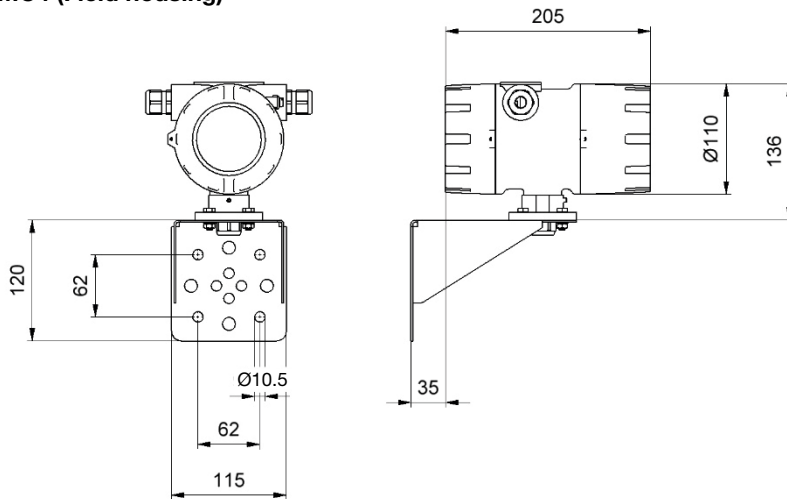


Dimensions [mm] (continued)

TMU-W006



UMC4 (Field housing)



UMC4-RM (Rack mount design)

