

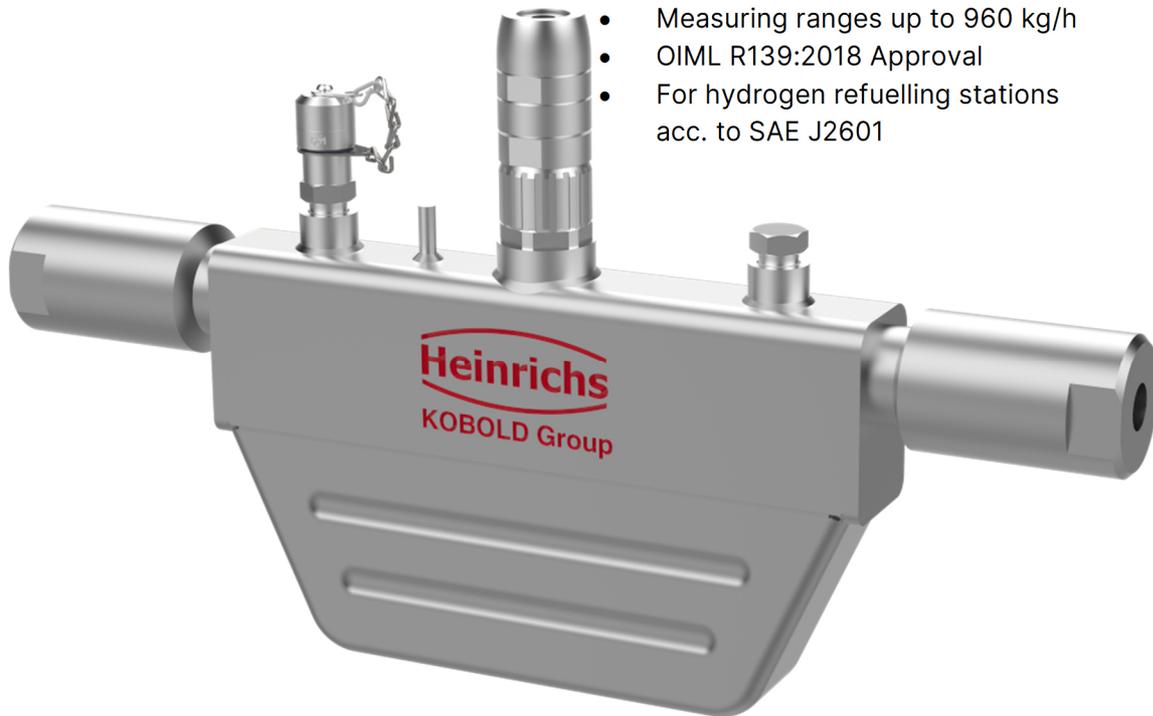
Coriolis Mass Flow Meter

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

TMU-W

Technical information

- 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



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: ½" 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 ...+100 °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 / UKEX: 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:

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

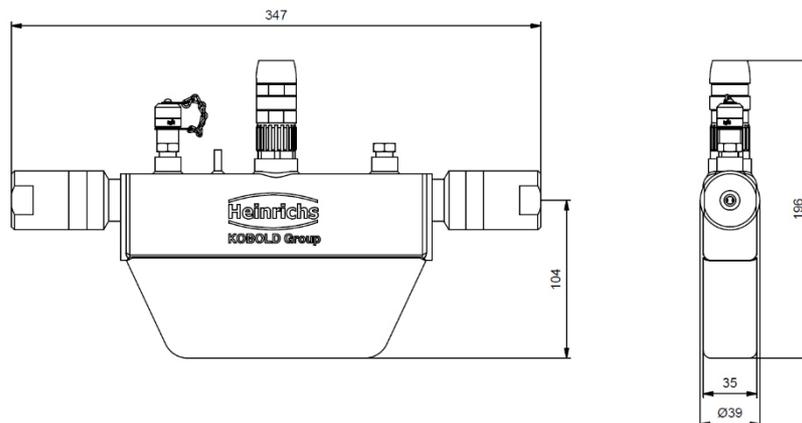
Measuring ranges

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

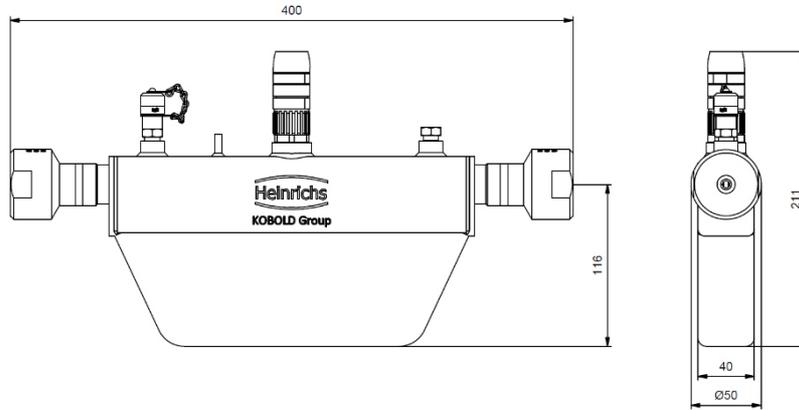
TMU-W006: max. 16kg/min H₂ (P_{nom} 500 Bar)

Dimensions

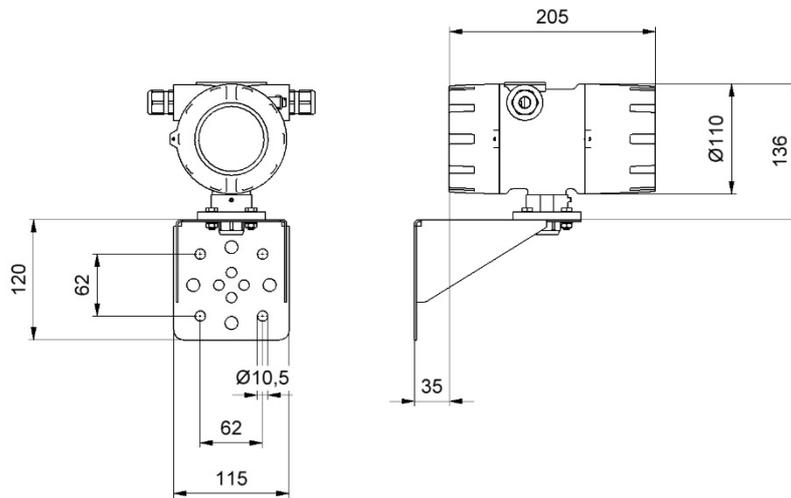
TMU-W004



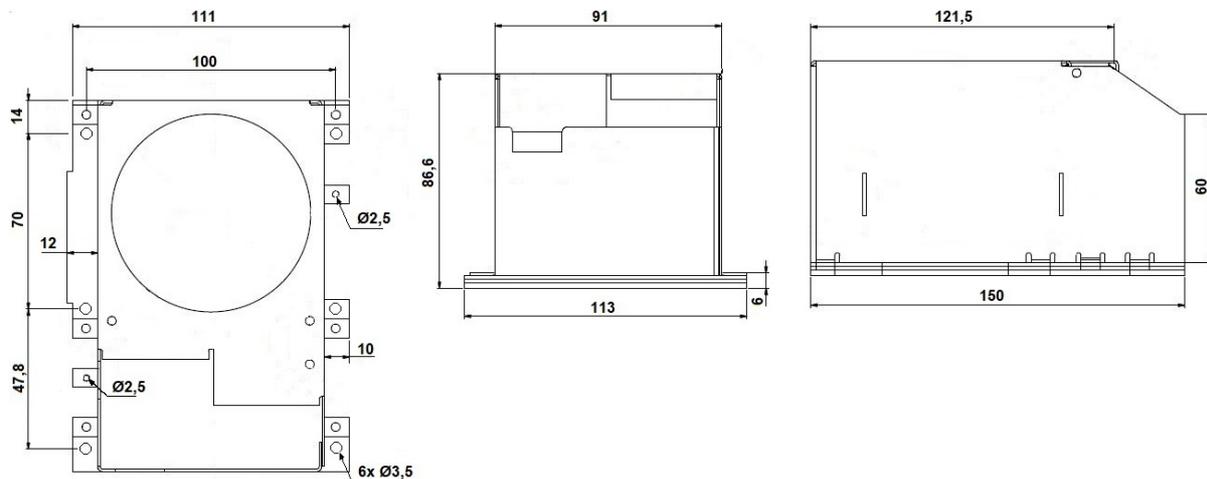
TMU-W006



UMC4 (Field housing)



UMC4-RM (Rack mount design)



Necessary data for the sizing of the meter

Medium: _____

	Nominal	Minimum	Maximum	Unit
Flow rate:	_____	_____	_____	_____
Process pressure:	_____	_____	_____	_____
□ abs. / □ gauge.	_____	_____	_____	_____
Process temperature:	_____	_____	_____	_____
Density: (at process condition)	_____	_____	_____	_____
Viscosity: (at process condition)	_____	_____	_____	_____

Order details sensor

Example: TMU-W004-4500-A00-K0-70-0-H

Model code	Description	Notes
TMU		
-	Wetted materials	Measuring range P _{Nom}
W004	Stainless steel 316TI / 14571	4 kg/min H ₂ 1000 Bar
W006	Stainless steel 316TI / 14571	16 kg/min H ₂ 500 Bar 2)
-	Process connection	Installation length / P _{Nom}
		W004 W006
6010	1/4" NPT (f)	347 mm / 500 Bar 400 mm / 500 Bar
6030	1/2" NPT (f)	347 mm / 500 Bar 400 mm / 500 Bar
4550	Hofer 7/8"	347 mm / 500 Bar 400 mm / 500 Bar
4500	6MF 9/16-18 UNF	347 mm / 1000 Bar 400 mm / 500 Bar
XXXX	Special, customer specified	
-	Sensor containment	
A	Stainless steel (1.4301)	Overpressure blow out, N ₂ filling nozzle, N ₂ filled
	Heating / Cooling	
00	without	
-	Transmitter mounting	Process temperature Electrical connection
K	Remote mounted transmitter (IP67)	-50...100 °C (-58...212 °F) Connector (Harting Han® R23) 2)
X	Special, customer specified	
	Approvals	
0	without	
L	ATEX / IECEx / UKEX II 1/2G Ex ia IIC T2...T6 Ga/Gb	
B	NEPSI Ex ia IIC T2...T6 Ga/Gb	
-	Calibration flow	
1	Standard, 3-point	
3	External lab	
7	OIML R139:2018. Hydrogen	1)
X	Special, customer specified	
	Calibration density	
0	without	
-	Supplementary equipment	
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	
-	Design	
H	Heinrichs	

Notes:

- 1) Must be used with approved UMC4 transmitter for system approval.
- 2) Not for OIML R139:2018. Hydrogen.

Order details transmitter

Example: UMC4-E11A21H

Model code		Hinweise	
UMC4			
-	Mounting		Conduit port opening
E	remote mount	without junction box	Transmitter with 5 m cable M20 x 1,5 1)
D	remote mount	with junction box	M20 x 1,5 1)
F	remote mount	via screw terminals	Rack mount version without
Display / interface board			
1	Integral within transmitter housing, for ambient temperature up to 60°C		
Power supply			
1	90...265 V _{AC} , 50/60 Hz 3), 4)		
2	19...36 V _{DC} , 24 V _{AC} (+5%...-20%), 50/60 Hz		
Outputs			
A	Analogue output 1: 4 ... 20 mA with HART® Analogue output 2: 4 ... 20 mA Pulse output: passive Status output: passive		
Approvals			
0	without Ambient temperature		
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)
3	ATEX, IECEx II (1)3G Ex ec [ia Ga] IIC T6..T3 Gc		Rack mount design -20...55 °C 2)
Type of protection (signal output)			
0	Without Approval 5)		
1	Intrinsically safe Ex [ia Ga]		
2	Not intrinsically safe		
Design			
H	Heinrichs		

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

Notes:

- 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"