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

Coriolis Mass Flowmeter

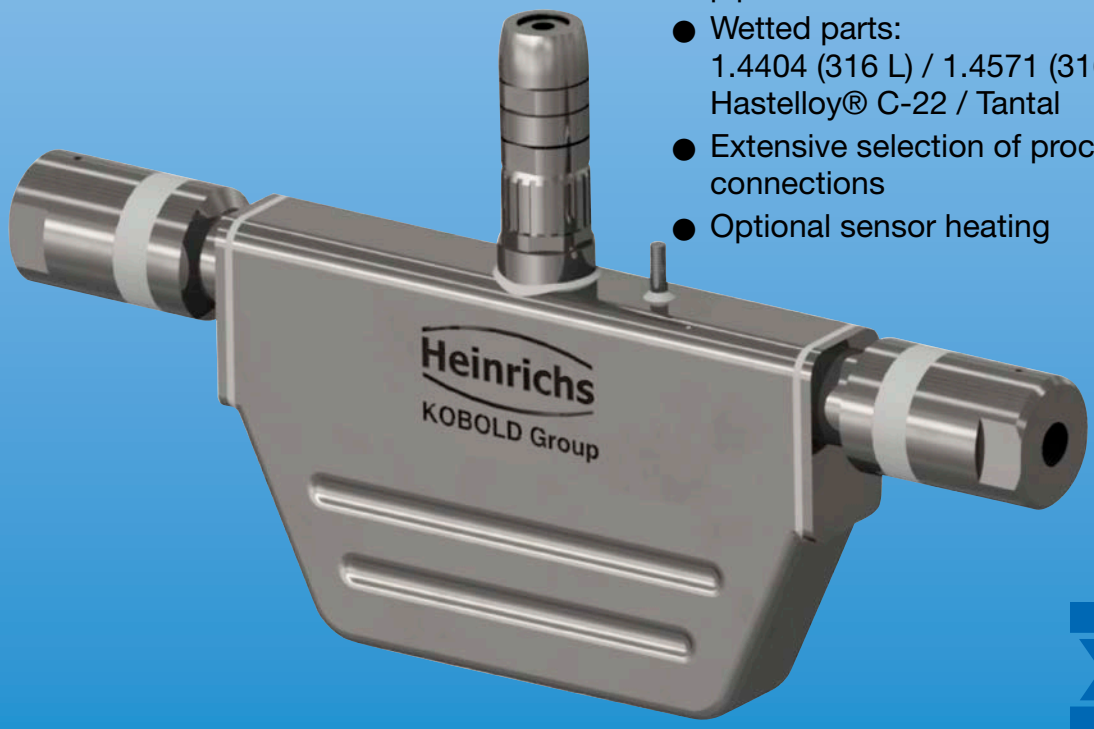
Standard device for all applications

measuring • monitoring • analysing

TMU

Type Approval

- Extremely compact lightweight design
- Measuring ranges from 60 kg/h to 2200 t/h
- Immune to external vibrations
- Immune to pipeline induced stresses
- Wetted parts: 1.4404 (316 L) / 1.4571 (316 Ti) / Hastelloy® C-22 / Tantal
- Extensive selection of process connections
- Optional sensor heating



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Function

The TMU Coriolis flow Sensors utilizes the Coriolis principle for the direct measurement of mass flow.

The sensor possesses two parallel-arranged tubes, which are continuously force-vibrated at their resonance frequency. When a fluid or gas passes through the tubes, the mass flow momentum in conjunction with the Coriolis effect invokes a change in the tubes deflection, causing the inlet and outlet legs of the tubes to twist out of phase.

Coupled with a UMC transmitter, the phase shift is captured and evaluated, the derived linear output being proportional to the mass-flow.

Application

The TMU Coriolis Mass Flow Sensors are designed for measuring the mass-flow, density and volume flow of almost all liquid and gaseous media.

Available as a standard configuration with a variety of process connections, the TMU sensors are optimised for the use in innumerable applications common to chemical, petrochemical, oil and gas, food and pharmaceutical industries.

The TMU Series also has a proven track record for use in precise dosing systems as well as in loading and unloading applications.

Technical Details

Sensor System:	**TMU**
System:	Coriolis dual-bent tubes TMU-x008 to TMU-x300 (x denotes tube material)
Accuracy liquid:	
Up to TMU050:	0.1 % of actual flowrate ± ZP stability
TMU080 and larger:	0.15 % of actual flowrate ± ZP stability
Accuracy gas:	
All Sensors	0.5 % of actual flowrate ± ZP stability
Wetted Parts: (Standard)	316 TI/1.4571, 316 L/1.4404 Hastelloy© C-22 Tantalum others on request
Process Connections:	Threaded connection G or NPT. Flanges acc. to DIN EN, ASME and JIS. Special version on request.
Sensor containment:	1.4301 (304L) Stainless Steel
Ambient temperature:	-40 ... +80 °C (-40 ... +176 °F)
Process temperature:	-50 ... +260 °C (-58 ... +500 °F)
Process Pressures:	Dependent on sensor size
Ingress Protection:	IP67 (EN 60529) / NEMA 6

Sensor Approvals:

NEPSI	Ex ia IIC T6...T2 Ga/Gb
CSA Class I Zone 0/Div1+2	AEx ia IIC T5 … T2 Ga/Gb / Group A,B,C,D
KCS (Korea)	Ex ia IIC T6 … T2 Ga/Gb
ATEX / IECEx	II 1/2G Ex ia IIC T6...T2 Ga/Gb
Ships approval	DNV / ABS

Accuracy

Liquid:	±0,1 % of reading ±zero point stability up to TMU-x040 ±0,15 % of reading ±zero point stability from TMU-x050
Gas:	±0,5 % of reading ±zero point stability
Density (liquid):	±0,005 g/cm³ with density calibration ±0,001 g/cm³ with special density calibration for TMU-x015, TMU-x025 and TMU-x040 ±0,002 g/cm³ with special density calibration for other models
Volume:	±0,2 % of reading ±zero point stability

Transmitter UMC4

Material

Housing:	aluminium (painted)
Display cover:	safety glass
Mounting:	integrated or remote mounted via junction box with cable gland (½" NPT (f), M20x1,5) or plug-in connector (Harting Han® R 23)
Power supply:	19 … 36 V_{DC}; 24 V_{AC} (+5 % ... -20 %), 50/60 Hz 90 … 265 V_{AC}, 50/60 Hz

Output signals

Outputs:	Each output circuit is galvanically isolated from each other as well as to ground.
Analog:	4 … 20mA, mit HART®, passive 4 … 20mA, passive mass flow, volume flow, density, temperature
Binary:	U_i = 30 V, I_i = 50 mA, P_i = 0,7 W, passive via optocoupler Pulse width: 50 ms (adjustable: 0,1 … 2000 ms) as frequency output with max. 1 kHz
Status:	Ui = 30V, Ii = 50mA, Pi = 0,7W, passive via optocoupler forward flow, reverse flow, MIN/MAX flow rate, MIN/MAX density, MIN/MAX temperature, alarm, second pulse output

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Technical Details (Fortsetzung)

	(out of phase by 90°)
Communication:	HART®
Ambient temperature:	-20 … +60 °C (standard)
Protection:	IP 68 (EN60529)

Approvals:

ATEX / IECEx	II(1)2G Ex d [ia Ga] IIC T4-T3 Gb
IECEx	Ex d [ia Ga] IIC T4-T3 Gb
OIML	R139 in combination with TMU-W
Ships approval	DNV, ABS

Transmitter UMC3

Material

Housing:	aluminium (painted)
Display cover:	safety glass
Mounting:	integrated or remote mounted via junction box with cable gland (½“NPT (f), M20x1,5) or plug-in connector (Harting Han® R 23)
Power supply:	19...36 V_{DC}, 24 V_{AC} (+5 % ... -20 %), 50/60 Hz 90...265 V_{AC}, 50/60 Hz
Outputs:	Each output circuit is galvanically isolated from each other as well as to ground.
Analog:	2 x 0 (4) - 20 mA
Binary 1:	24 V_{DC}, $I_{max.}$ 200 mA, active, potential-free U_i = 30 V, I_i = 200 mA, P_i = 3 W, passive via optocoupler Pulse width: 50 ms (adjustable: 0,1 … 2000 ms) as frequency output with max. 1 kHz
Binary 2:	U_i = 30 V, I_i = 200 mA, P_i = 3 W, passive via optocoupler
Status:	U_i = 30 V, I_i = 200 mA, P_i = 3 W, passive via optocoupler forward flow, reverse flow, MIN/MAX flow rate, MIN/MAX density, MIN/MAX temperature, alarm, second pulse output (out of phase by 90°)
Binary input:	function: counter reset function in the OIML version: error reset
Communication:	HART® Profibus-PA® Fieldbus® Foundation™ Modbus RTU (RS 485)
Ambient temperature:	-20 … +55 °C integrated transmitter for approval T4 or T5 -20 … +60 °C remote transmitter for approval T5 -20 … +55 °C remote transmitter for OIML-design
Protection:	IP 68 (EN60529)

Approvals:

ATEX	II(1)2G Ex d e [ia Ga] IIB/IIC T6-T3 Gb (explosion proof version connection area Ex e) II(1)2G Ex d [ia Ga] IIB/IIC T6-T3 Gb (explosion proof version connection area Ex d)
IECEx	Ex d [ia Ga] IIB/IIC T6-T3 Gb for transmitter Ex ia IIC T6 Ga for operating panel
NEPSI	Signal outputs intrinsically safe: Ex d ia [ia Ga] IIB/IIC T3~T6 Ga/Gb Ex d e ia [ia Ga] IIB/IIC T3~T6 Ga/Gb Signal outputs not intrinsically safe: Ex d ia IIB/IIC T3~T6 Ga/Gb Ex d e ia IIB/IIC T3~T6 Ga/Gb
OIML	GB-1659, acc. to R117
Ships approval	DNV, ABS

Standard Flow Ranges

Model	**Max. measuring range** kg/h [lbs/min]	**Nominal** (Δp = 1bar) kg/h [lbs/min]	**Zero point stability** (of range) kg/h [lbs/min]
TMU-x008	600 [22.0]	330 [12.1]	0.03 [0.001]
TMU-x010	2500 [91.9]	1150 [42.3]	0.125 [0.005]
TMU-x015	12000 [440.9]	5250 [192.9]	0.6 [0.022]
TMU-x025	30000 [1102.3]	20000 [734.9]	1.5 [0.055]
TMU-x040	60000 [2204.6]	55000 [2020.9][1]	3 [0.110]
TMU-x050	80000 [2939.4]	74000 [2719.0]	4 [0.147]
TMU-x080	120000 [4409.2]	118000 [4335.7][2]	12 [0.4]
TMU-x100	200000 [7348.6]	200000 [7348.6][3]	20 [0.7]
TMU-x150	460000 [16901.8]	460000 [16901.8][3]	46 [1.7]
TMU-x200	700000 [25720.2]	700000 [25720.2][4]	70 [2.6]
TMU-x250	1500000 [55114.6]	1350000 [49603.2]	150 [5.5]
TMU-x300	2200000 [80834.8]	1900000 [69811.9]	220 [8.1]

[1] (Δp = 0.87 bar)
[2] (Δp = 0.95 bar)
[3] (Δp = 0.93 bar)
[4] (Δp = 0.66 bar)

Pressure Ratings

All Sensor sizes are available with standard flanges according to Class 150 and PN40 / Class 300 pressure ratings.
Depending on the sensor size, higher-pressure rated flanges are available upon request.
Contact our sales department for more information.

Flow Ranges - Approvals

Model	Standard [kg/h]	ABS[1] [kg/h]	DNV[1] [kg/h]	OIML[1] [kg/h]
TMU-x008	60 … 600	N/A	0 … 30 up to 0 … 600	N/A
TMU-x010	250 … 2.500	N/A	0 … 125 up to 0 … 2.500	N/A
TMU-x015	600 … 9.000	600 … 12.000 [2)4)]	0 … 1.200 up to 0 … 12.000	600 … 9.000
TMU-x025	3.000 … 30.000	1.500 … 30.000 [2)4)]	0 … 3.000 up to 0 … 30.000	1.500 … 30.000
TMU-x040	6.000 … 60.000	3.000 … 60.000 [2)4)]	0 … 6.000 up to 0 … 60.000	3.000 … 60.000
TMU-x050	8.000 … 80.000	4.000 … 80.000 [3)4)]	0 … 20.000 up to 0 … 80.000	4.000 … 80.000
TMU-x080	25.000 … 120.000	6.000 … 120.000 [3)4)]	0 … 25.000 up to 0 … 120.000	6.000 … 120.000
TMU-x100	30.000 … 200.000	10.000 … 200.000 [3)4)]	0 … 30.000 up to 0 … 200.000	10.000 … 200.000
TMU-x150	60.000 … 460.000	23.000 … 460.000 [3)4)]	0 … 60.000 up to 0 … 460.000	23.500 … 460.000
TMU-x200	150.000 … 700.000	35.000 … 700.000 [3)4)]	0 … 150.000 up to 0 … 700.000	35.000 … 700.000
TMU-x250	300.000 … 1.500.000	N/A	N/A	N/A
TMU-x300	400.000 … 2.200.000	N/A	N/A	N/A

[1] Must be used with approved transmitter for system approval.
[2] Measurement accuracy ±0.1 % ±Z.P.
[3] Measurement accuracy ±0.15 % ±Z.P.
[4] Repeatability ±0.05 % ±½ Z.P.

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Order Details Sensor (Example: **TMU-S008 6010 A00 A 0 1 0**)

Model / material	Sensor / measuring range	Process connection	Containment	Heating / cooling
TMU-S.. stainless steel **TMU-H..** Hastelloy C-22	**008** = DN8, 60 ... 600 kg/h	**6010** = ¼" NPT (f) **6030** = ½" NPT (f) **301B** = flange DN10 PN40 [1] **201R** = flange ½" Class 150 RF [2] **221R** = flange ½" Class 300 RF **241R** = flange ½" Class 600 RF [2] **XXXX** = special (please specify in clear text)	**A** = standard containment 1.4301 **B** = standard containment with drain connection ½" NPT female	**0** = without **A** = heating plate (up to TMU050) **B** = heating loop (from TMU080)
	010 = DN10, 250 ... 2500 kg/h	**6010** = ¼" NPT (f) **6030** = ½" NPT (f) **301B** = flange DN10 PN40 [1] **305B** = flange DN15 PN40 [1] **309B** = flange DN25 PN40 [1] **201R** = flange ½" Class 150 RF [2] **221R** = flange ½" Class 300 RF **241R** = flange ½" Class 600 RF [2] **202R** = flange ¾" Class 150 RF [2] **222R** = flange ¾" Class 300 RF **242R** = flange ¾" Class 600 RF [2] **203R** = flange 1" Class 150 RF **223R** = flange 1" Class 300 RF [2] **243R** = flange 1" Class 600 RF **XXXX** = special (please specify in clear text)		
	015 = DN15, 1200 ... 12000 kg/h OIML version in combination with UMC3: 600 ... 9000 kg/h	**6030** = ½" NPT (f) **305B** = flange DN15 PN40 [1] **309B** = flange DN25 PN40 [1] **321B** = flange DN50 PN40 [1] **201R** = flange ½" Class 150 RF [2] **221R** = flange ½" Class 300 RF **241R** = flange ½" Class 600 RF [2] **202R** = flange ¾" Class 150 RF [2] **222R** = flange ¾" Class 300 RF **242R** = flange ¾" Class 600 RF [2] **203R** = flange 1" Class 150 RF [2] **223R** = flange 1" Class 300 RF **243R** = flange 1" Class 600 RF [2] **205R** = flange 1 ½" Class 150 RF **225R** = flange 1 ½" Class 300 RF [2] **XXXX** = special (please specify in clear text)		
	025 = DN25, 3000 ... 30000 kg/h OIML Version in combination with UMC3: 1500 ... 30000 kg/h	**309B** = flange DN25 PN40 [1] **317B** = flange DN40 PN40 [1] **321B** = flange DN50 PN40 [1] **203R** = flange 1" Class 150 RF [2] **223R** = flange 1" Class 300 RF **243R** = flange 1" Class 600 RF [2] **205R** = flange 1 ½" Class 150 RF [2] **225R** = flange 1 ½" Class 300 RF **245R** = flange 1 ½" Class 600 RF [2] **206R** = flange 2" Class 150 RF [2] **226R** = flange 2" Class 300 RF **246R** = flange 2" Class 600 RF **XXXX** = special (please specify in clear text)		

[1] Flange according to DIN EN1092-1 form B1
[2] ASME B16.5-2003

Order Details Sensor (Example: **TMU-S008 6010 A00 A 0 1 0**) (continued)

Model / material	Sensor / measuring range	Process connection	Containment	Heating / cooling
TMU-S.. stainless steel **TMU-H..** Hastelloy C-22	**040** = DN40, 6000 ... 60 000 kg/h OIML version in combination with UMC3: 3000 ... 60 000 kg/h	**317B** = flange DN 40 PN 40 [1] **321B** = flange DN 50 PN 40 [1] **331B** = flange DN 80 PN 40 [1] **205R** = flange 1 ½" Class 150 RF [2] **245R** = flange 1 ½" Class 600 RF [2] **226R** = flange 2" Class 300 RF **206R** = flange 2" Class 150 RF [2] **228R** = flange 3" Class 300 RF [2] **XXXX** = special (please specify in clear text)	**A** = standard containment 1.4301 **B** = standard containment with drain connection ½" NPT female	**0** = without **A** = heating plate (up to TMU050) **B** = heating loop (from TMU080)
	050 = DN50, 8000 ... 80 000 kg/h OIML version in combination with UMC3: 4000 ... 80 000 kg/h	**317B** = flange DN 40 PN 40 [1] **321B** = flange DN 50 PN 40 [1] **331B** = flange DN 80 PN 40 [1] **335B** = flange DN100 PN16 [1] **205R** = flange 1 ½" Class 150 RF [2] **245R** = flange 1 ½" Class 600 RF [2] **206R** = flange 2" Class 150 RF [2] **226R** = flange 2" Class 300 RF [4] **208R** = flange 3" Class 150 RF [2] **248R** = flange 3" Class 600 RF [2] **210R** = flange 4" Class 150 RF [2] **230R** = flange 4" Class 300 RF [2] **XXXX** = special (please specify in clear text)		
	080 = DN80, 25 000 ... 120 000 kg/h OIML version in combination with UMC3: 6000 ... 120 000 kg/h	**321B** = flange DN 50 PN40 [1] **331B** = flange DN 80 PN40 [1] **335B** = flange DN100 PN16 [1] **340B** = flange DN125 PN16 [1] **345B** = flange DN150 PN16 [1] **206R** = flange 2" Class 150 RF [2] **246R** = flange 2" Class 600 RF [2] **208R** = flange 3" Class 150 RF [2] **248R** = flange 3" Class 600 RF [2] **210R** = flange 4" Class 150 RF [2] **230R** = flange 4" Class 300 RF [2] **211R** = flange 5" Class 150 RF [2] **231R** = flange 5" Class 300 RF [2] **212R** = flange 6" Class 150 RF [2] **232R** = flange 6" Class 300 RF [2] **XXXX** = special (please specify in clear text)		
	100 = DN100, 30 000 ... 200 000 kg/h OIML Version in combination with UMC3: 10 000 ... 200 000 kg/h	**331B** = flange DN 80 PN 40 [1] **335B** = flange DN100 PN16 [1] **345B** = flange DN150 PN16 [1] **208R** = flange 3" Class 150 RF [2] **248R** = flange 3" Class 600 RF [2] **210R** = flange 4" Class 150 RF [2] **230R** = flange 4" Class 300 RF [2] **212R** = flange 6" Class 150 RF [2] **232R** = flange 6" Class 300 RF [2] **XXXX** = special (please specify in clear text)		

[1] Flange according to DIN EN1092-1 form B1
[2] ASME B16.5-2003

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Order Details Sensor (Example: **TMU-S008 6010 A00 A 0 1 0**) (continued)

Model / material	Sensor / measuring range	Process connection	Containment	Heating/ cooling
TMU-S.. stainless steel **TMU-H..** Hastelloy C-22	**150** = DN150, 60 000 ... 460 000 kg/h OIML Version in combination with UMC3: 23 500 ... 460 000 kg/h	**335B** = flange DN100 PN16 [1] **345B** = flange DN150 PN16 [1] **350B** = flange DN200 PN16 [1] **210R** = flange 4" Class 150 RF [2] **230R** = flange 4" Class 300 RF [2] **212R** = flange 6" Class 150 RF [2] **232R** = flange 6" Class 300 RF [2] **213R** = flange 8" Class 150 RF [2] **233R** = flange 8" Class 300 RF [2] **XXXX** = special (please specify in clear text)	**A** = standard containment 1.4301 **B** = standard containment with drain connection ½" NPT female	**0** = without **A** = heating plate (up to TMU050) **B** = heating loop (from TMU080)
	200 = DN200, 150 000 ... 700 000 kg/h OIML Version in combination with UMC3: 35 000 ... 700 000 kg/h	**345B** = flange DN150 PN16 [1] **350B** = flange DN200 PN16 [1] **356B** = flange DN250 PN16 [1] **212R** = flange 6" Class 150 RF [2] **232R** = flange 6" Class 300 RF [2] **213R** = flange 8" Class 150 RF [2] **233R** = flange 8" Class 300 RF [2] **214R** = flange 10" Class 150 RF [2] **234R** = flange 10" Class 300 RF [2] **XXXX** = special (please specify in clear text)		
	250 = DN250, 300 000 ... 1 500 000 kg/h	**350B** = flange DN200 PN16 [1] **356B** = flange DN250 PN16 [1] **363B** = flange DN300 PN16 [1] **213R** = flange 8" Class 150 RF [2] **233R** = flange 8" Class 300 RF [2] **214R** = flange 10" Class 150 RF [2] **234R** = flange 10" Class 300 RF [2] **215R** = flange 12" Class 150 RF [2] **235R** = flange 12" Class 300 RF [2] **XXXX** = special (please specify in clear text)		
	300 = DN300, 400 000 ... 2 200 000 kg/h	**355B** = flange DN250 PN10 [1] **362B** = flange DN300 PN10 [1] **369B** = flange DN350 PN10 [1] **375B** = flange DN400 PN10 [1] **214R** = flange 10" Class 150 RF [2] **234R** = flange 10" Class 300 RF [2] **215R** = flange 12" Class 150 RF [2] **235R** = flange 12" Class 300 RF [2] **216R** = flange 14" Class 150 RF [2] **236R** = flange 14" Class 300 RF [2] **217R** = flange 16" Class 150 RF [2] **XXXX** = special (please specify in clear text)		

[1] Flange according to DIN EN1092-1 form B1
[2] ASME B16.5-2003

Order Details Sensor (continued)

Connection for heating / cooling	Sensor / process temperature / thread junction box	Approvals	Calibration massflow	Calibration density	Additional options
0 = without **A** = with Ermeto EO12 **B** = with Swagelok® 12 mm **C** = with DN15 PN40 acc. to DIN EN 1092-1 form B1 **D** = with flange ½" class 150 RF ASME B16.5-2003 **E** = with ½" NPT (f) **F** = with DN25 PN40 acc. to DIN EN 1092-1 form B1 **G** = with flange 1" class 150 RF ASME B16.5-2003 **H** = with 1" NPT (f)	**A** = integrated transmitter, -20 ... 100 °C **B** = integrated transmitter, -20 ... 150 °C **C** = remote mounted transmitter, -40 ... 100 °C, junction box via ½" NPT (f) **D** = remote mounted transmitter, -40 ... 180 °C, junction box via ½" NPT (f) **E** = remote mounted transmitter, -40 ... 260 °C, junction box via ½" NPT (f) **F** = remote mounted transmitter , -40 ... 100 °C, junction box via M20x1,5 **G** = remote mounted transmitter, -40 ... 180 °C, junction box via M20x1,5 **H** = remote mounted transmitter, -40 ... 260 °C, junction box via M20x1,5 **J** = remote mounted transmitter, -40 ... 60 °C, plug-in connector (Harting Han® R 23) **K** = remote mounted transmitter, -40 ... 100 °C, plug-in connector (Harting Han® R 23) **L** = remote mounted transmitter, -40 ... 180 °C, plug-in connector (Harting Han® R 23) **M** = remote mounted transmitter, -40 ... 260 °C, plug-in connector (Harting Han® R 23)	**0** = without **B** = NEPSI Ex ia IIC T6...T2 Ga/Gb **D** = CSA Class I Zone 0/Div1+2 AEx ia IIC T5 ... T2 Ga/Gb / Group A,B,C,D **K** = KCS (Korea) Ex ia IIC T6 ... T2 Ga/Gb **L** = ATEX / IECEx II 1/2G Ex ia IIC T6...T2 Ga/Gb **S** = Ships approval DNV / ABS [1]	**1** = standard, 3-point **2** = 10-point **3** = outside lab	**0** = without **1** = standard, 3-point **2** = special, 5-point	**0** = without **X** = with (separate specification necessary)

[1] see table Flow Ranges - Approvals

Necessary Details for Dimensioning the TMU Instrument

- medium
- process temperature min./max.
- ambient temperature min./max.
- measuring range
- operating pressure
- viscosity
- density

Order Details Transmitter UMC3 (Example: UMC3 - A 0 1 A 0 0K)

Model	Mounting / connection to sensor / thread cable connection	Display / Interface board	Power supply	Outputs
UMC3-	**A** = integrated transmitter / - / ½" NPT (f) **B** = integrated transmitter / - / M20x1,5 **C**[1] = remote mounted transmitter / terminal block with ½" NPT (f)/ ½" NPT (f) **D**[1] = remote mounted transmitter / terminal block with M20x1,5 / M20x1,5 **E**[1] = remote mounted transmitter / plug-in connector Harting Han® R23 / ½" NPT (f) **F**[1] = remote mounted transmitter / plug-in connector Harting Han® R23 / M20x1,5	**0** = without **1** = integrated in transmitter housing, ambient temperature up to 60 °C	**1** = 90 - 265 V_{AC}, 50/60 Hz **2** = 19 - 36 V_{DC}, 24 V_{AC} (+5 ... -20 %), 50/60 Hz	**A** = analogue output 1: (0)4 - 20 mA with HART® protocol analogue output 2: (0) 4 - 20 mA pulse output: passive U_i = 30 V_{DC} status output: passive U_i = 30 V_{DC} **B**[2] = analogue output 1: (0)4 - 20 mA with HART® protocol analogue output 2: (0)4 - 20 mA pulse output: active 24 V_{DC} status output: passive U_i = 30 V_{DC} **D**[3] = Profibus-PA® (Ex ia IIC), without analogue and binary outputs **F**[4] = Modbus RTU (RS 485) analogue output 1: (0)4 - 20 mA pulse output: passive 24 V_{DC} status output: passive 24 V_{DC} **J** = Fieldbus® Foundation™

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Order Details Transmitter UMC3 (continued)

Approvals	Protection signal output
0 = without	**0K** = without
1 = ⟨Ex⟩ II(1)2G Ex de [ia] IIB/IIC T3...T6 Ga/Gb terminal compartment: Ex e for ambient temperature -20 … +60 °C	**1K** = Ex [ia Ga] **2K** = Ex e (not intrinsically safe)
2 = ⟨Ex⟩ II(1)2G Ex d [ia] IIB/IIC T3...T6 Ga/Gb terminal compartment: Ex d for ambient temperature -20 … +60 °C	
4 = NEPSI ambient temperature up to -20 … +60 °C	
5 = ⟨Ex⟩ II(1)2G Ex de [ia] IIB/IIC T3...T6 Ga/Gb terminal compartment: Ex e for ambient temperature -20 … +80 °C	
6 = ⟨Ex⟩ II(1)2G Ex d [ia] IIB/IIC T3...T6 Ga/Gb terminal compartment: Ex d for ambient temperature -20 … +80 °C	
7 = Ships approval DNV/ABS	

[1] - Incl. wall mounting bracket, pipe mounting bracket must be ordered separately (see accessories)
- Connection cable (sensor to transmitter) and cable gland must be ordered separately (see accessories)

[2] Signal output in Ex ia not possible

[3] Not available with approval

[4] Not available with approval 4, 5, or 6 not with signal output protection 2K

Order Details Transmitter UMC4 (Example: **UMC4 - B 1 1 A 0 0K**)

Model	Mounting/connection to sensor/ thread cable connection	Display / Interface board	Power supply	Outputs
UMC4-	**B** = integrated transmitter/-/M20x1.5 **D**[1] = remote mounted transmitter/ with terminal block/M20x1.5 (specify cable length in clear text) **E**[1] = remote mounted transmitter/ transmitter with 5 m cable/M20x1.5	**1** = integrated in transmitter housing, ambient temperature -20 … +60 °C	**1** = 90 - 265 V_{AC}, 50/60 Hz **2** = 19 - 36 V_{DC}, 24 V_{AC} (+5 … -20 %), 50/60 Hz	**A** = analogue output, 0 (4) - 20 mA with/without HART®, pulse output passive U_m = 30 V_{DC}, status output passive U_m = 30 V_{DC}

Order Details Transmitter UMC4 (continued)

Approvals	Protection signal output
0 = without	**0K** = without
2 = ⟨Ex⟩ II(1)2G Ex d [ia Ga] IIC T3-T4 Gb terminal compartment: Ex d ambient temperature -20...+60°C	**1K** = Ex [ia Ga] **2K** = not intrinsically safe

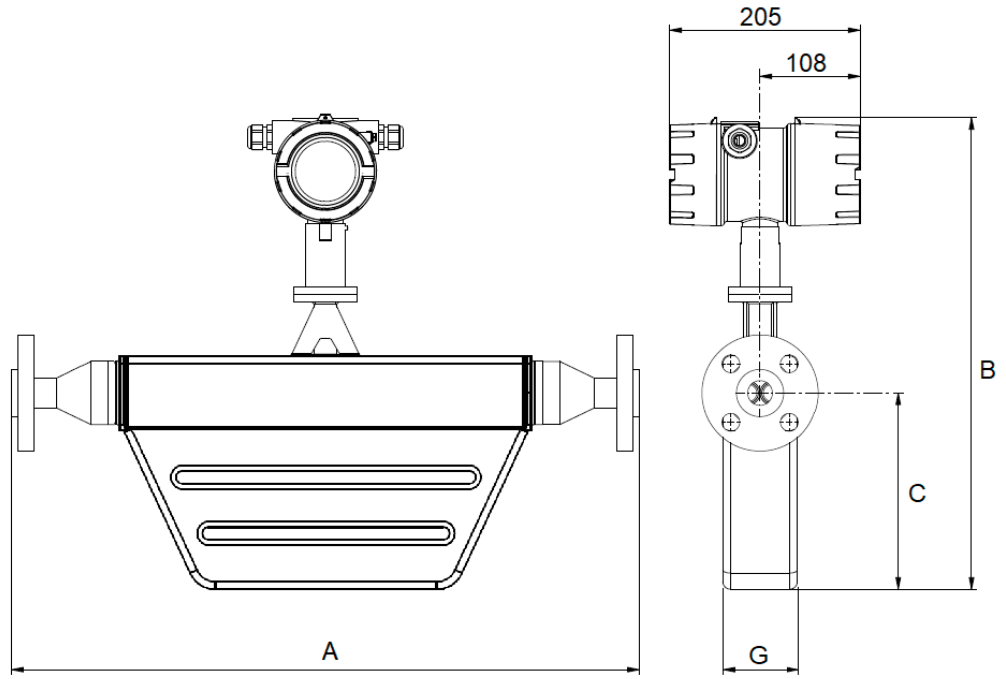
[1] - Incl. wall mounting bracket, pipe mounting bracket must be ordered separately (see accessories)
- Connection cable (sensor to transmitter) and cable gland must be ordered separately (see accessories)

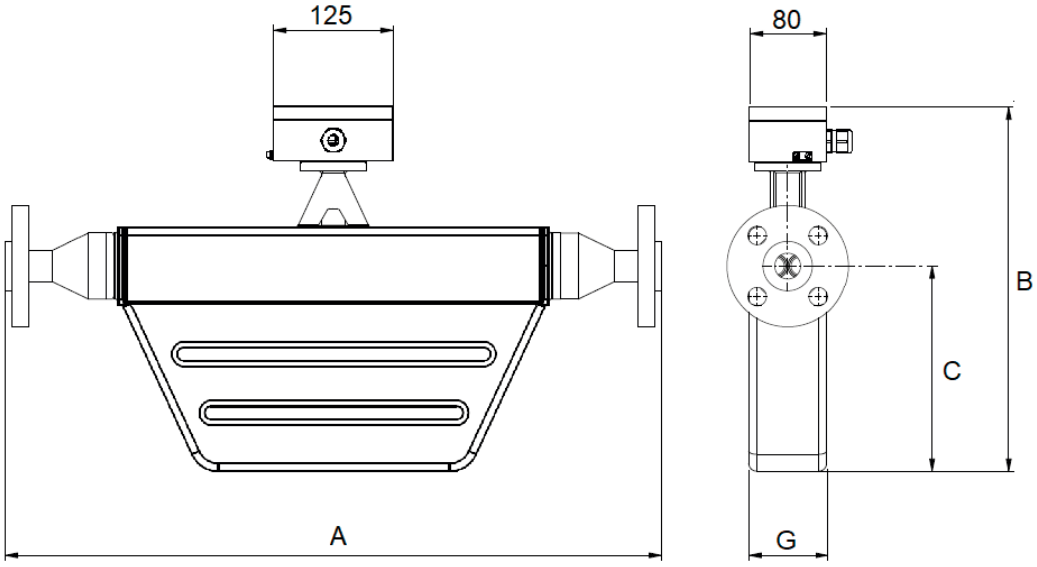
Order Details Accessories (Example: **TMK - BL KK 005**)

Order number	Model	Version	Cable length / application area
TMK-	**BL** = connection cable	**KK** = sensor-transmitter with connection cable **SK** = sensor-transmitter cable end 1: plug (Harting Han® R23) cable end 2: cable connect **SS** = plug connection on both sides (Harting Han® R23) **UB** = transmitter-interface board plug connection	**Cable length** **005** = 5 m **010** = 10 m **015** = 15 m **030** = 30 m **075** = 75 m **150** = 150 m **300** = 300 m **XXX** = special length
	V = cable gland set	**AU** = integrated transmitter **GU** = remote mounted transmitter	**Application area** **NEM 20** = not Ex, M20x1.5 **NENPT** = not Ex, ½" NPT **DEIAM 20** = Ex de - Ex ia, M20x1.5 **DEIANPT** = Ex de - Ex ia, ½" NPT **DEEM 20** = Ex de - Ex e, M20x1.5 **DEENPT** = Ex de - Ex e, ½" NPT
TM-	**ROHRMONT** = accessory for 2" pipe mounting		

Dimensions [mm]

Sensors up to TMU-x050





Dimensions on page 12

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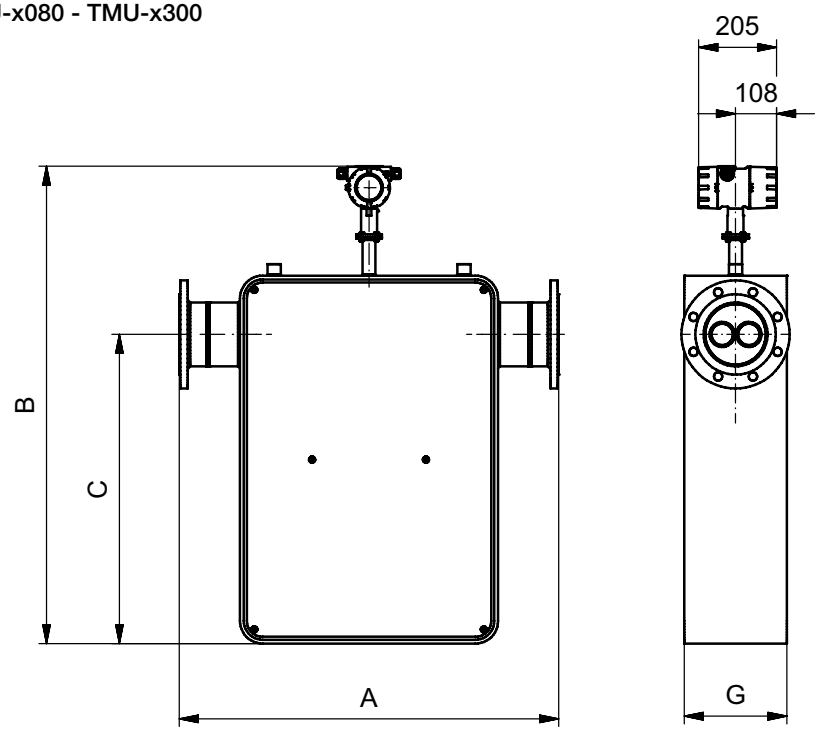
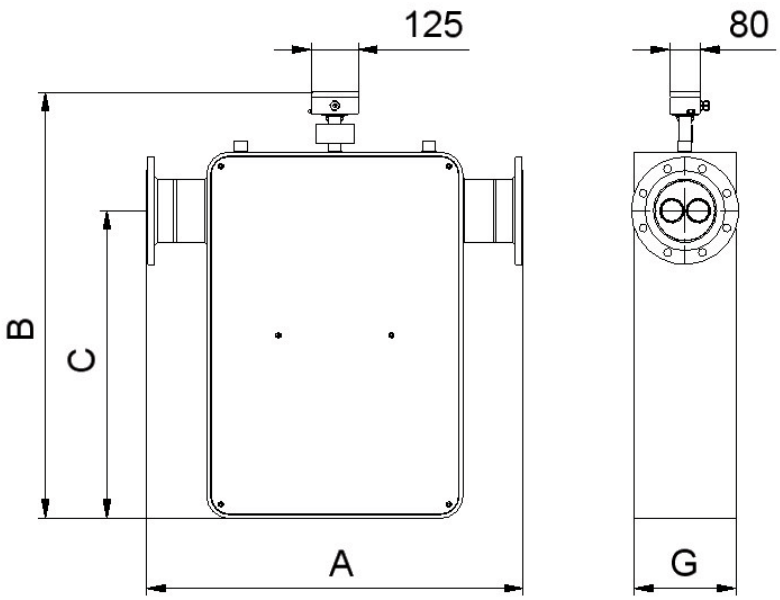
Semsors TMU-x080 - TMU-x300





Dimensions on page 12

Table of installation lengths

Model	A (Installation length)											
	Process connection	mm [inch]	Process connection	mm [inch]	Process connection	mm [inch]	Process connection	mm [inch]	Process connection	mm [inch]	Process connection	mm [inch]
TMU-x008	¼" NPT (f)	320 [12.6]	DN10	300 [11.8]	½" 150 lb	300 [11.8]	-	-	-	-	-	-
	½" NPT (f)	320 [12.6]	-	-	½" 300 lb	310 [12.2]	-	-	-	-	-	-
	-	-	-	-	½" 600 lb	330 [13.0]	-	-	-	-	-	-
TMU-x010	¼" NPT (f)	380 [15.0]	DN10	390 [15.4]	½" 150 lb	380 [15.0]	¾" 150 lb	380 [15.0]	1" 150 lb	380 [15.0]	-	-
	½" NPT (f)	380 [15.0]	DN15	410 [16.1]	½" 300 lb	390 [15.4]	¾" 300 lb	380 [15.0]	1" 300 lb	380 [15.0]	-	-
	-	-	DN25	410 [16.1]	½" 600 lb	390 [15.4]	¾" 600 lb	390 [15.4]	1" 600 lb	400 [15.7]	-	-
TMU-x015	½" NPT (f)	460 [18.1]	DN15	500 [19.7]	½" 150 lb	460 [18.1]	¾" 150 lb	480 [18.9]	1" 150 lb	490 [19.3]	1½" 150 lb	600 [23.6]
	-	-	DN25	500 [19.7]	½" 300 lb	460 [18.1]	¾" 300 lb	490 [19.3]	1" 300 lb	500 [19.7]	1½" 300 lb	600 [23.6]
	-	-	DN50	500 [19.7]	½" 600 lb	460 [18.1]	¾" 600 lb	500 [19.7]	-	-	-	-
TMU-x025	-	-	DN25	600 [23.6]	1" 150 lb	650 [25.6]	1½" 150 lb	650 [25.6]	2" 150 lb	650 [25.6]	-	-
	-	-	DN40	600 [23.6]	1" 300 lb	660 [26.0]	1½" 300 lb	660 [26.0]	2" 600 lb	660 [26.0]	-	-
	-	-	DN50	600 [23.6]	1" 600 lb	675 [26.6]	1½" 600 lb	675 [26.6]	3" 150 lb	675 [26.6]	-	-
TMU-x040	-	-	DN40	800 [31.5]	1½" 150 lb	900 [35.4]	2" 150 lb	900 [35.4]	3" 300 lb	900 [35.4]	-	-
	-	-	DN50	800 [31.5]	1½" 600 lb	900 [35.4]	2" 300 lb	900 [35.4]	-	-	-	-
	-	-	DN80	850 [33.5]	-	-	-	-	-	-	-	-
TMU-x050	-	-	DN40	800 [31.5]	1½" 150 lb	900 [35.4]	2" 150 lb	900 [35.4]	3" 150 lb	900 [35.4]	4" 150 lb	900 [35.4]
	-	-	DN50	800 [31.5]	1½" 600 lb	900 [35.4]	2" 300 lb	900 [35.4]	3" 600 lb	900 [35.4]	4" 300 lb	900 [35.4]
	-	-	DN80	850 [33.5]	-	-	-	-	-	-	-	-
	-	-	DN100	850 [33.5]	-	-	-	-	-	-	-	-
TMU-x080	-	-	DN50	1150 [45.3]	2" 150 lb	1200 [47.2]	3" 150 lb	1218 [48.0]	4" 150 lb	1230 [48.4]	5" 150 lb	1000 [39.4]
	-	-	DN80	1196 [47.1]	2" 600 lb	1225 [48.2]	3" 600 lb	1243 [48.9]	4" 300 lb	1250 [49.2]	5" 300 lb	1000 [39.4]
	-	-	DN100	1184 [46.6]	-	-	-	-	-	-	-	-
	-	-	DN125	925 [36.4]	-	-	-	-	-	-	-	-
TMU-x100	-	-	DN80	1350 [53.1]	3" 150 lb	1375 [54.1]	4" 150 lb	1400 [55.1]	6" 150 lb	1154 [45.4]	-	-
	-	-	DN100	1350 [53.1]	3" 600 lb	1413 [55.6]	4" 300 lb	1420 [55.9]	6" 300 lb	1173 [46.2]	-	-
	-	-	DN150	1090 [42.9]	-	-	-	-	-	-	-	-
TMU-x150	-	-	DN100	1700 [66.9]	4" 150 lb	1770 [69.7]	6" 150 lb	1796 [70.7]	8" 150 lb	1525 [60.0]	-	-
	-	-	DN150	1725 [67.9]	4" 300 lb	1775 [69.9]	6" 300 lb	1815 [71.5]	8" 300 lb	1545 [60.8]	-	-
	-	-	DN200	1448 [57.0]	-	-	-	-	-	-	-	-
TMU-x200	-	-	DN150	2175 [85.6]	6" 150 lb	2225 [87.6]	8" 150 lb	2270 [89.4]	10" 150 lb	1925 [75.8]	-	-
	-	-	DN200	2175 [85.6]	6" 300 lb	2250 [88.6]	8" 300 lb	2275 [89.6]	10" 300 lb	1957 [77.0]	-	-
	-	-	DN250	1850 [72.8]	-	-	-	-	-	-	-	-
TMU-x250	-	-	DN200	2275 [89.6]	8" 150 lb	2350 [92.5]	10" 150 lb	2348 [92.4]	12" 150 lb	1975 [77.8]	-	-
	-	-	DN250	2275 [89.6]	8" 300 lb	2375 [93.5]	10" 300 lb	2375 [93.5]	12" 300 lb	2025 [79.7]	-	-
	-	-	DN300	1925 [75.8]	-	-	-	-	-	-	-	-
TMU-x300	-	-	DN250	2875 [113.2]	10" 150 lb	2950 [116.1]	12" 150 lb	3000 [118.1]	14" 150 lb	3000 [118.1]	-	-
	-	-	DN300	2875 [113.2]	10" 300 lb	3008 [118.4]	12" 300 lb	3030 [119.3]	14" 300 lb	3050 [120.1]	-	-
	-	-	DN350	2975 [117.1]	-	-	-	-	-	-	-	-
	-	-	DN350	2200 [86.6]	-	-	-	-	-	-	-	-

Other flanges on request.

Table of Dimensions

	B					C	D
	Integrated mounted transmitter		Remote mount transmitter				
	-40 °C ... 100 °C (-40 °F ... 212 °F)	-40 °C ... 150 °C (-40 °F ... 302 °F)	-40 °C ... 100 °C (-40 °F ... 212 °F)	-40 °C ... 180 °C (-40 °F ... 356 °F)	-40 °C ... 260 °C (-40 °F ... 500 °F)		
Model	mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]
TMU-x008	354 [13.9]	456 [18.0]	223 [8.8]	325 [12.8]	425 [16.7]	82 [3.2]	35 [1.4]
TMU-x010	374 [14.7]	476 [18.7]	243 [9.6]	345 [13.6]	445 [17.5]	100 [3.9]	40 [1.6]
TMU-x015	444 [17.5]	546 [21.5]	313 [12.3]	415 [16.3]	515 [20.3]	160 [6.3]	60 [2.4]
TMU-x025	505 [19.9]	607 [23.9]	374 [14.7]	476 [18.7]	576 [22.7]	211 [8.3]	80 [3.1]
TMU-x040	664 [26.1]	766 [30.2]	533 [21.0]	635 [25.0]	735 [28.9]	312 [12.3]	136 [5.4]
TMU-x050	664 [26.1]	766 [30.2]	533 [21.0]	635 [25.0]	735 [28.9]	312 [12.3]	230 [9.1]
TMU-x080	1241 [48.9]	1343 [52.9]	1110 [43.7]	1212 [47.7]	1312 [51.7]	800 [31.5]	250 [9.8]
TMU-x100	1261 [49.6]	1363 [53.7]	1130 [44.5]	1232 [48.5]	1332 [52.4]	815 [32.1]	270 [10.6]
TMU-x150	1591 [62.6]	1693 [66.7]	1460 [57.5]	1562 [61.5]	1662 [65.4]	1070 [42.1]	380 [15.0]
TMU-x200	1751 [68.9]	1853 [73.0]	1620 [63.8]	1722 [67.8]	1822 [71.7]	1210 [47.6]	400 [15.7]
TMU-x250	1891 [74.4]	1993 [78.5]	1760 [69.3]	1862 [73.3]	1962 [77.2]	1300 [51.2]	550 [21.7]
TMU-x300	1896 [74.6]	1998 [78.7]	1765 [69.5]	1867 [73.5]	1967 [77.4]	1400 [55.1]	510 [20.1]

Heated Sensors

Sensors, equipped with heating plates, may have varying dimension depending on the mounted heating equipment and their associated flanges.

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