

Coriolis Mass Flow Meter

TM

- Immune to vibration effects
- Immune to pipeline generated stresses
- Digital signal processing (DSP)
- High pressure application

Function

The TM Series Mass Flow Meter utilizes the Coriolis principle of operation to measure mass flow. Density and temperature are simultaneously monitored and volumetric flow is additionally calculated with these parameters. The TM Series is available with a direct mounted transmitter or in a remote mounted configuration.

Application

The TM Series can be used to meter nearly all liquid or gaseous media. Available in a variety of end connections, the TM can be used in many applications common to chemical, petrochemical, oil and gas, food and pharmaceutical industries. The TM Series is also used for precise dosing applications.

The TM Series has following unique features:

- Superior Accuracy
 - Industry's widest selection of wetted materials
 - Thick pipe wall construction for ultra-high pressure capability
 - Superior heating jacket technology
- Approvals for service in custody transfer (fiscal metering) applications are also available.





Technical Data

Sensor

End connections:	Flanges acc. EN 1092, ANSI B16.5, DIN2512, JIS, NPT, screw pipe connection, other connections on request
Nominal pressure:	PN 40, ANSI 150 / 300 / 600 lbs (Standard) Max. 900 bar
Process temperature:	-90°C to +260°C (-130 to +500°F)
Ambient temperature:	-40°C to +60°C (-40 to +140°F)
Ingress protection:	IP 65 / IP 68 (EN60529) (NEMA 4X / 6)

Materials

Flow tubes, splitter, flanges:	1.4404 (316 L) / 1.4571 (316 Ti) / Hastelloy C-22 Hastelloy B-2, Monel, Nickel, Tantalum, other materials on request
Housing:	1.4301 (304 L)/Al up to TM040, St 37.2/Al or 1.4301 TM050 Pressure-resistant version welded or screwed
Explosion protection:	Sensor circuits: intrinsically safe DMT 01 ATEX E 149 X II 1/2G EEx ia IIC T6–T2, (Approval for Zone 0 inside flow tubes available)

Transmitter

Power supply:	19 - 36 VDC, 24 VAC ± 20%, 90 - 265 VAC
Outputs:	Galvanically isolated
Current:	2 x 0/4-20 mA
Binary 1:	active, potential free 24 V=, max. 200 mA passive, optocoupler, U _i =30 V, I _i =200mA, P _i =3 W
Frequency:	1 KHz
Binary 2:	passive, optocoupler, U _i =30 V, I _i =200mA, P _i =3 W
Status:	passive, optocoupler, U _i =30 V, I _i =200mA, P _i =3 W
Input Binary:	Counter reset

Accuracy

Liquid:	± 0,1% of reading (± 0,05% with spec. calibr.) ± zero point stability
Gas:	± 0,5% of reading ± zero point stability
Density (liquid):	± 0,005 g/cm ³ (with density calibration) ± 0,003 g/cm ³ (with special density calibration)
Volume:	± 0,2% ± zero point stability
Ambient temperature:	-20°C to +60°C (-4°F to +140°F)

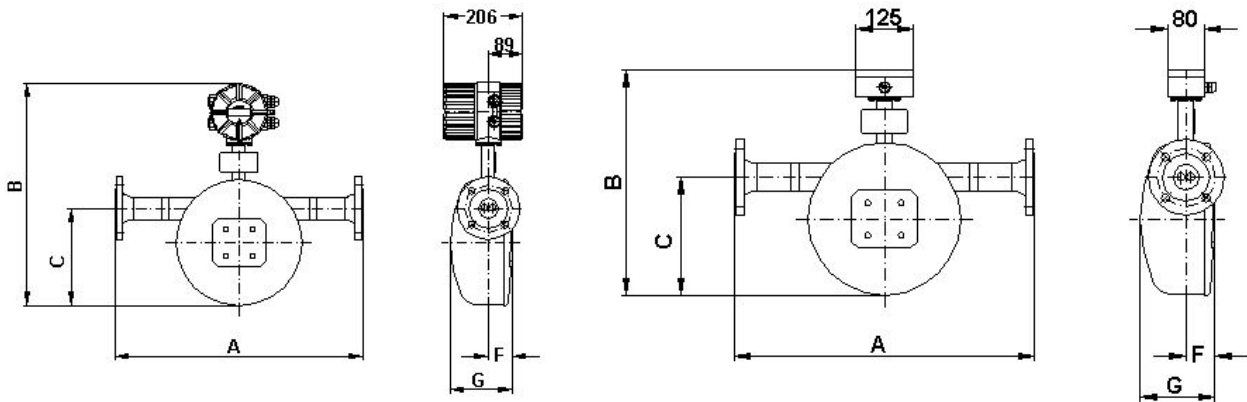
Ingress protection:	IP 68 (EN60529) (NEMA 6)
Explosion protection:	BVS 05 ATEX E 021 X
Increased safety EEx e (connection area):	II (1)2G EEx de [ia] IIC/IIB T6–T3
Explosion proof EEx d (connection area):	II (1)2G EEx d [ia] IIC/IIB T6–T3
Intrinsically safe EEx i (signal output):	II (1)2G EEx de [ia] IIC/IIB T6–T3, II (1)2G EEx d [ia] IIC/IIB T6–T3

CE-Marking:	EMC-Directive 89/336/EEC, EN 61000-6-3:2001 (emissions residential environments) EN 61000-6-2:1999 (immunity for industrial environments) Pressure Equipment Directive 97/23/EC Explosion Protection Directive 94/9/EC
Communication:	HART® (Drivers for Sensor Port, AMS, EDD, PDM) Profibus-PA (EDD, PDM) RS 485-Modbus (in progress)

Dimensions

Model	A											
	End connection	mm [inch]	End connection	mm [inch]	End connection	mm [inch]	End connection	mm [inch]	End connection	mm [inch]		
TM002 - TM005	SW10	350 [13,8]	SW12	350 [13,8]	DN10 PN40	350 [13,8]	½" NPT (f)	350 [13,8]	½" NPT (f)	350 [13,8]	ANSI ½" 150/600lb	350 [13,8]
TM006	SW10	350 [13,8]	SW12	350 [13,8]	DN10 PN40	350 [13,8]	½" NPT (f)	350 [13,8]	½" NPT (f)	350 [13,8]	ANSI ½" 150/600lb	350 [13,8]
TM008	SW12	350 [13,8]	DN10 PN40	350 [13,8]	DN15 PN40	350 [13,8]	½" NPT (f)	350 [13,8]	½" NPT (f)	350 [13,8]	ANSI ½" 150/600lb	350 [13,8]
TM010	DN10 PN40	400 [15,7]	DN15 PN40	400 [15,7]	DN25 PN40	400 [15,7]	½" NPT (f)	400 [15,7]	ANSI ½" 150/600lb	400 [15,7]	ANSI ½" 150/600lb	400 [15,7]
TM015	-	-	DN15 PN40	450 [17,7]	DN25 PN40	450 [17,7]	½" NPT (f)	450 [17,7]	ANSI ¾" 150/600lb	450 [17,7]	ANSI 1" 150/600lb	450 [17,7]
TM020	DN15 PN40	550 [21,7]	DN25 PN40	550 [21,7]	DN50 PN40	550 [21,7]	ANSI ½" 150/600lb ¾" NPT (f)	550 [21,7] 550 [21,7]	ANSI ¾" 150/600lb	550 [21,7]	ANSI 1" 150/600lb	550 [21,7]
TM025	-	-	DN25 PN40	650 [25,6]	DN50 PN40	650 [25,6]	ANSI ¾" 150/600lb ¾" NPT (f)	650 [25,6] 650 [25,6]	ANSI 1" 150/600lb	650 [25,6]	ANSI 1½" 150/600lb	650 [25,6]
TM050	DN50 PN40	750 [29,5]	DN80 PN40	750 [29,5]	DN100 PN40	750 [29,5]	ANSI 1½" 150/600lb	750 [29,5]	ANSI 2" 150/600lb	750 [29,5]	ANSI 3" 150/600lb	750 [29,5]

Model	B					C	F	G
	Integrated Mount Transmitter		Remote Mount Transmitter					
	-40°C - 100°C (-40°F to 212°F)	-40°C - 150°C (-40°F to 302°F)	-40°C - 100°C (-40°F to 212°F)	-40°C - 180°C (-40°F to 356°F)	-40°C - 260°C (-40°F to 500°F)			
mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]	mm [inch]	
TM002 - TM005	429 [16,9]	531 [20,9]	331 [13,0]	433 [17,0]	533 [21,0]	125 [4,9]	42 [1,7]	94 [3,7]
TM006 - TM008	429 [16,9]	531 [20,9]	331 [13,0]	433 [17,0]	533 [21,0]	125 [4,9]	42 [1,7]	94 [3,7]
TM010	482 [19,0]	584 [23,0]	384 [15,1]	486 [19,1]	586 [23,1]	170 [6,7]	45 [1,8]	112 [4,4]
TM015 - TM020	534 [21,0]	636 [25,0]	436 [17,2]	538 [21,2]	638 [25,1]	215 [8,5]	52 [2,0]	132 [5,2]
TM025	584 [23,0]	686 [27,0]	486 [19,1]	588 [23,1]	688 [27,1]	255 [10,0]	62 [2,4]	162 [6,4]
TM050	699 [27,5]	801 [31,5]	601 [23,7]	703 [27,7]	803 [31,6]	378 [14,9]	102 [4,0]	272 [10,7]



Ranges

Model	Mass flow			Zero point stability (of range)
	Min. measuring range	Max. measuring range	Nominal (Dp=1bar)	
	kg/h [lbs/min]	kg/h [lbs/min]	kg/h [lbs/min]	kg/h [lbs/min]
TM002-S	0,8 [0,0]	8 [0,3]	6 [0,2]	0,0008 [0,000]
TM003-S	2 [0,1]	20 [0,7]	19 [0,7]	0,002 [0,000]
TM004-S	8 [0,3]	80 [2,9]	49 [1,8]	0,008 [0,000]
TM005-S	15 [0,6]	150 [5,5]	144 [5,3]	0,015 [0,001]
TM006-S/H	20 [0,7]	200 [7,3]	88 [3,2]	0,02 [0,001]
TM008-S/H	35 [1,3]	350 [12,9]	277 [10,2]	0,035 [0,00]
TM010-S/H	120 [4,4]	1.200 [44,1]	1.070 [39,3]	0,12 [0,00]
TM015-S/H	300 [11,0]	3.000 [110,2]	3.000 [110,2]*	0,3 [0,0]
TM020-S/H	600 [22,0]	6.000 [220,5]	6.000 [220,5]	0,6 [0,0]
TM025-S/H	2.000 [73,5]	20.000 [734,9]	25.000 [918,6]	2 [0,1]
TM050-S	4.000 [147,0]	40.000 [1.469,7]	37.000 [1.359,5]	4 [0,1]
TM050-H	4.000 [147,0]	35.000 [1.286,0]	29.000 [1.065,5]	3,5 [0,1]
* ($\Delta p=0,5\text{bar}$)				
TM010-T	120 [4,4]	1.200 [44,1]	1.060 [38,9]	0,12 [0,00]
TM015-T	400 [14,7]	3.000 [110,2]	3.000 [110,2]*	0,3 [0,0]
TM020-T	700 [25,7]	6.000 [220,5]	4.850 [178,2]	0,6 [0,0]
TM025-T	2.000 [73,5]	18.000 [661,4]	13.500 [496,0]	1,8 [0,1]
TM050-T	4.000 [147,0]	30.000 [1.102,3]	30.500 [1.120,7]	3 [0,1]
* ($\Delta p=0,57\text{bar}$)				

UMC 3 Connections

Designation	Terminal designation	Type of protection		Standard (Not Ex)
		EEx ia	EEx e	
Signal outputs				
Current 1, 0/4 to 20mA with HART®	11 and 12	x		x
	41 and 42		x	
Current 2, 0/4 to 20mA	13 and 14	x		x
	43 and 44		x	
Binary output 1 (passive pulse)	16 and 17	x		x
	46 and 47		x	
Binary output 1 (active pulse)	45 and 48		x	
	15 and 18			x
Binary output 2 (status or second passive pulse output for custody transfer operations)	19 and 20	x		x
	49 and 50		x	
Option Binary output 3 (status output during custody transfer operations)	33 and 34	x		x
	53 and 54		x	
Profibus PA option	39 (A) and 40 (B)	x		
Control unit BE	Shield, -, +	x		x
Alternatives for current output 2				
Binary input	21 and 22	x		x
	51 and 52		x	
Modbus/Profibus DP with RS 485-IS	35 (A) and 36 (B) (in progress)	x		x
Profibus DP	37 (A) and 38 (B) (in progress)		x	

For further information see device description TM_UMC3_GB_XX_en



Since 1970
Representative for



www.heinrichs-mt.nl

Adinco bv

P.O.Box 90
4190 CB Geldermalsen
Netherlands

Tel. +31 (0) 345 59 60 00
Fax +31 (0) 345 59 60 01

E-mail: info@adinco.nl
Internet: www.adinco.nl