

# Coriolis Mass Flow Meter

## TMR DN100

- Replaces PD meters without modifying the piping
- No servicing required
- No filters needed
- Wear-free
- Process temperature up to 260°C
- Immune to vibration effects
- Immune to pipeline generated stresses
- Digital signal processing (DSP)

### Function

The TMR 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 TMR Series is available with a direct mounted transmitter or in a remote mounted configuration.

### Application

The TMR Series is specially designed to replace PD meters. Compared to PD meters the sensors series TMR are maintenance free and wear free. No filters are needed to protect the TMR against solids.

The TMR can be used to meter nearly all liquids. The TMR can be used in many standard applications common to chemical, petrochemical and oil industries. The TMR Series is also used for precise dosing as well as in loading and unloading applications.

The TMR is easy to install and ideal designed for a replacement of PD meters without modifying existing pipe installations.





## Technical Data

### Sensor

Flow range:	minimum 0 to 25,000 kg/h maximum 0 to 120,000 kg/h
Dimensions:	650 mm (overall length)
End connections:	Flanges DN100 PN40 Form C DIN2501
Process temperature:	-40°C to +260°C (-40°F to +500°F)
Ambient temperature (junction box):	-40°C to +100°C (-40°F to +212°F)
Ingress protection:	IP 65 (EN60529) (NEMA 4X)

### Materials

Flow tubes, flanges:	1.4571 (316 Ti)
Housing:	carbon steel
Explosion protection:	DMT 01 ATEX E 149 X Sensor circuits: intrinsically safe (II 1/2G EEx ia IIC T6–T2)

### Transmitter

Power supply:	19 - 36 VDC, 24 VAC $\pm$ 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, $I_i=200$ mA, $P_i=3$ W
Frequency:	1 KHz
Binary 2:	passive, optocoupler, $U_i=30$ V, $I_i=200$ mA, $P_i=3$ W
Status:	passive, optocoupler, $U_i=30$ V, $I_i=200$ mA, $P_i=3$ W
Input Binary:	Counter reset

### Accuracy (under reference cond.)

Liquid:	$\pm$ 0.15% of reading $\pm$ zero point stability
Ambient temperature:	-20°C to +60°C (-4°F to +140°F) -20°C to +80°C (-4°F to +176°F) (approval pending)

Ingress protection: IP 68 (EN60529) (NEMA 6)

Explosion protection:	BVS 05 ATEX E 021 X
Increased safety EEx e (terminals):	II (1)2G EEx de [ia] IIB/IIC T3–T6
Expl. proof EEx d (transmitter housing):	II (1)2G EEx d [ia] IIB/IIC T3–T6
Intrinsically safe EEx i (signal output):	II (1)2G EEx de [ia] IIB/IIC T3–T6, II (1)2G EEx d [ia] IIB/IIC T3–T6

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 AMS, EDD, PDM)  
Profibus-PA (EDD, PDM), (optional)

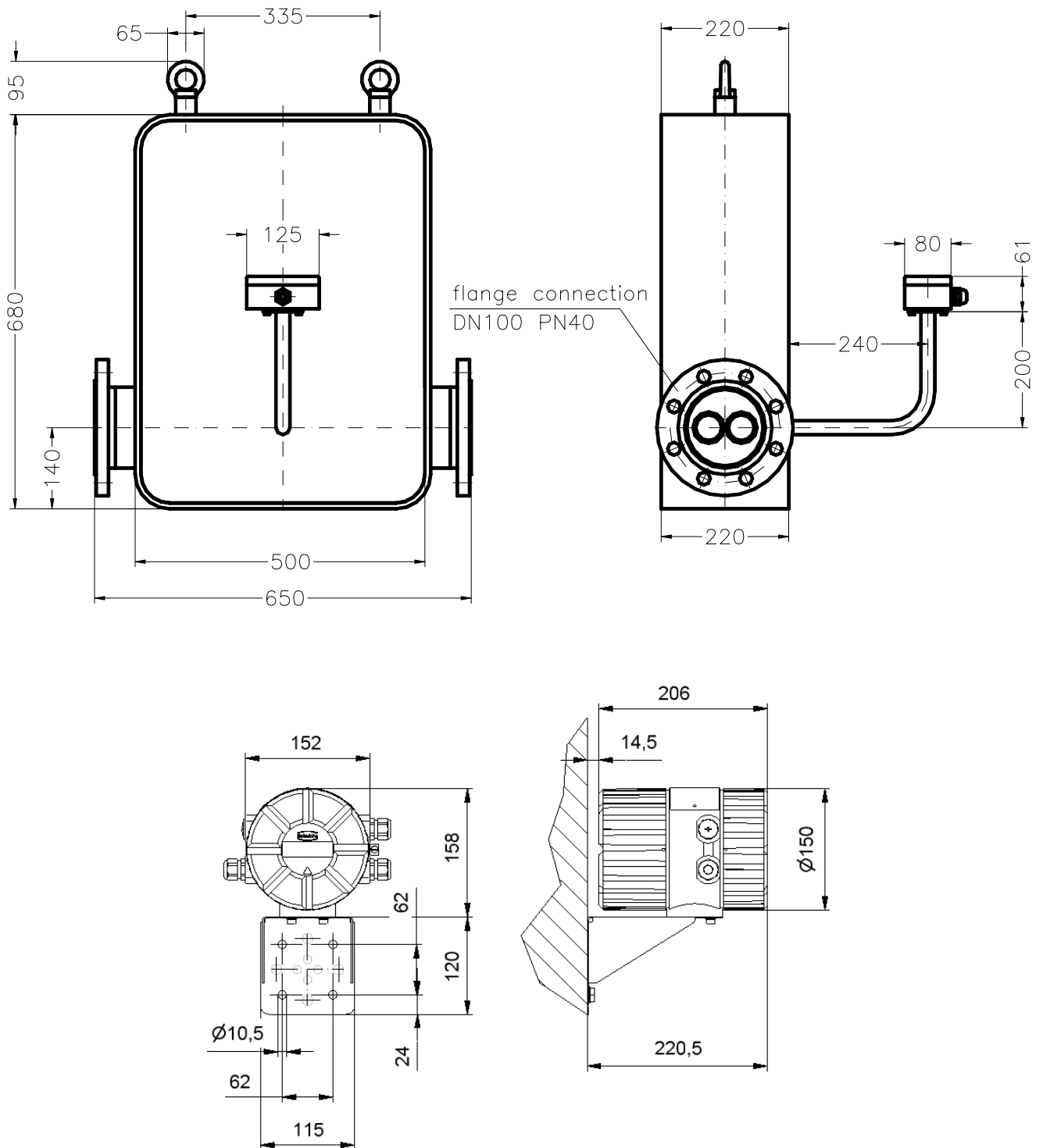
## Transmitter UMC3



### UMC3 Connections

Designation	Terminal designation	Type of protection		Standard
		EEx ia	Non intrinsically safe circuits	
<b>Signal outputs</b>				
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
<b>Alternatives for current output 2</b>				
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	

## Dimensions



For further information see device description TMR\_UMC3\_GB\_XX\_en

Heinrichs Messtechnik GmbH

P. O. Box 600260  
D-50682 Cologne

Robert-Perthel-Straße 9  
D-50739 Cologne

Phone +49-221-49708-0  
Fax +49-221-49708-178

www.heinrichs-mt.com  
info@heinrichs-mt.com



# Coriolis Massflowmeter TMR

TMR DN100



Modelcode  
valid: 04.2006

Model number	Description	Notes
Block no. 1 23 TMR -		
Block no. 4 5 6 7 8 9 10 11 S	<b>Wetted materials (Block no. 1)</b> Stainless steel	
Block no. 12 13 14 15 67	<b>Range (Block no. 2, 3)</b> min. 0-25.000 kg/h - max. 0-120.000 kg/h	
Block no. 16 136C	<b>Process connection (Block no. 4, 5, 6, 7)</b> DN100 PN40 Form C DIN 2501	
Block no. 17 0650	<b>Installation length (Block no. 8, 9, 10, 11)</b> 650 mm	
Block no. 18 A E	<b>Containment options (Block no. 12)</b> Standard sensor body (carbon steel) Stainless steel	
0	<b>Heating / cooling (Block no. 13)</b> without	
U O L R	<b>Flow direction (Block Nr. 14)</b> Bottom to top Top to bottom Left to right Right to left	
1 2 3 4 5 6 7 8	<b>Sensor configuration (Block no. 15)</b>	
	Integral mount transmitter	Temperature Service Rating: -4°F to 212°F, -20°C to 100°C; Sensor Cable Connection: -
	Integral mount transmitter	Temperature Service Rating: -4°F to 302°F, -20°C to 150°C; Sensor Cable Connection: -
	Remote mount transmitter	Temperature Service Rating: -40°F to 212°F, -40°C to 100°C; Sensor Cable Connection: Terminal block via M20x1,5
	Remote mount transmitter	Temperature Service Rating: -40°F to 356°F, -40°C to 180°C; Sensor Cable Connection: Terminal block via M20x1,5
	Remote mount transmitter	Temperature Service Rating: -40°F to 500°F, -40°C to 260°C; Sensor Cable Connection: Terminal block via M20x1,5
	Remote mount transmitter	Temperature Service Rating: -40°F to 212°F, -40°C to 100°C; Sensor Cable Connection: Terminal block via 1/2" NPT (f)
	Remote mount transmitter	Temperature Service Rating: -40°F to 356°F, -40°C to 180°C; Sensor Cable Connection: Terminal block via 1/2" NPT (f)
	Remote mount transmitter	Temperature Service Rating: -40°F to 500°F, -40°C to 260°C; Sensor Cable Connection: Terminal block via 1/2" NPT (f)
0 A	<b>Approvals (Block no. 16)</b> without approval II 1/2G EEx ia IIC T6 - T2	
1 2 B C	<b>Certificate (Block Nr. 17)</b> without Certificate of compliance with the order, 2 Test report, 2.2 Inspection certificate 3.1 with material certificate (DIN EN 10204:2004) Inspection certificate 3.2 with material certificate (DIN EN 10204:2004)	
0 X	<b>Supplementary equipment (Block no. 18)</b> without with (separate specification necessary)	



# Coriolis Massflowmeter Transmitter UMC3



Modelcode  
valid: 06.2005

Model number	Description	Notes
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Block no. 1 2 3 4 5 6  
**UMC3** -

A  
B  
C  
D  
E  
F

0  
1  
2

1  
2

A  
B  
C  
D  
E

0  
1  
2  
3

0  
1  
2

Mounting (Block no. 1)	Sensor Cable Connection	Conduit port opening
Integral mount	-	1/2" NPT (f)
Integral mount	-	M20 x 1,5
Remote mount	terminal block via 1/2" NPT (f)	1/2" NPT (f) 1) 2)
Remote mount	terminal block via M20X1.5	M20 x 1,5 1) 2)
Remote mount	plug-in connector (Harting Han® R 23)	1/2" NPT (f) 1) 2)
Remote mount	plug-in connector (Harting Han® R 23)	M20 x 1,5 1) 2)

Display / Interface board (Block no. 2)	
None	
Integral within transmitter housing	
Remotable, separate board plus panel mounting adapter kit	on request 3)

Power supply (Block no. 3)	
90 - 265V AC, 50/60Hz	
19 - 36V DC, 24V AC (±20%), 50/60Hz	

Outputs (Block no. 4)	
Analog output 1: (0) 4 - 20mA with HART® Analog output 2: (0) 4 - 20mA Pulse output: passive Um=30V DC Status output: passive Um=30V DC	
Analog output 1: (0) 4 - 20mA mit HART® Analog output 2: (0) 4 - 20mA Pulse output: active 24V DC Status output: passive Um=30V DC	4)
Custody transfer Analog output: (0) 4 - 20mA mit HART® Pulse output 1: passive Um=30V DC Pulse output 2: passive Um=30V DC Status output: passive Um=30V DC Binary input: passive Um=30V DC	
Profibus PA (EEx ia IIC) all analog and digital outputs disabled	
Profibus DP V1 all analog and digital outputs disabled	on request

Approvals (Block no. 5)	
none	5)
II(1)2G EEx de [ia] IIB/IIC T3-T6 (Type of protection connection area EEx e)	6)
II(1)2G EEx d [ia] IIB/IIC T3-T6 (Type of protection connection area EEx d)	6)
FM/CSA, Class 1, Division 1	pending

Type of protection (signal output) (Block no. 6)	
none	
EEx ia	
EEx e (not intrinsically safe)	

1) Includes mounting bracket for wall. Adapter for 2" pipe mounting bracket, select from accessories list.  
 2) Requires sensor to transmitter interconnecting cable and cable gland, select from accessories list.  
 3) Requires sensor to transmitter interconnecting cable, select from accessories list.  
 4) Signal output EEx ia not possible  
 5) only possible with signal output "0"  
 6) not possible with signal output "0"