

# TCM 230K Series

## Coriolis Mass Flow Meter and Density Meter for Marine Fuel Consumption Management

- > All in one mass flow and density meter
- > Customized installation length
- > Direct mass flow measurement
- > Real time density measurement for fuel quality control
- > Maintenance free
- > No moving parts
- > Replaces all kind of volume based flow meters
- > Excellent repeatability in order to determine actions for process/engine optimization
- > Recommended 5 year meter recalibration

### Accuracy<sup>1)</sup>:

Basic Accuracy [Mass Flow]:	±0.1 % of flow rate
Mass Flow Repeatability:	±0.05 % of flow rate
Basic Accuracy [Volume Flow]:	±0.15 % of flow rate
Volume Flow Repeatability:	±0.05 % of flow rate
Zero Stability:	±0.01 % of full scale

### Density:

Density Range:	up to 2,500 kg/m <sup>3</sup> , 2.5 g/cm <sup>3</sup>
Density Accuracy:	Liquids ±1.0 kg/m <sup>3</sup> , ±0.001 g/cm <sup>3</sup>
Density Repeatability:	±0.5 kg/m <sup>3</sup> , ±0.0005 g/cm <sup>3</sup>

### Temperature:

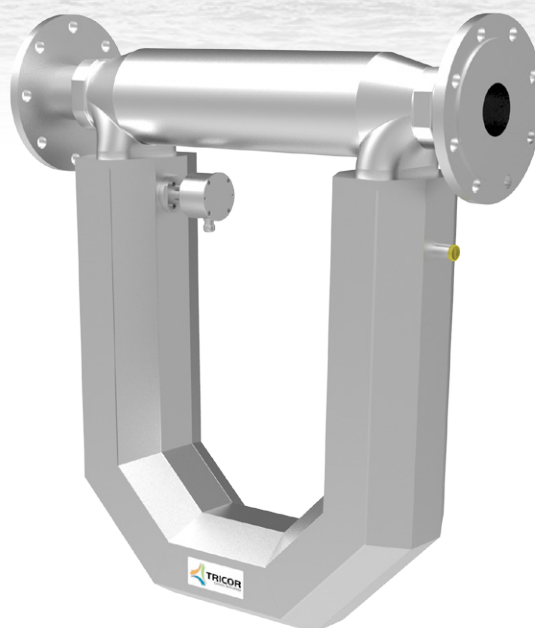
Process Temperature Range:	Standard: -40 °F ... +212 °F (-40 °C ... +100 °C)
	Optional <sup>2)</sup> : -76 °F ... +302 °F (-60 °C ... +150 °C)
	-76 °F ... +392 °F (-60 °C ... +200 °C)
Temperature Accuracy:	±1.8 °F ±0.5 % of reading (±1 °C ±0.5 % of reading)
Temperature Repeatability:	±0.36 °F (±0.2 °C)

### Materials of Construction [wetted parts]:

Tubes:	1.4404/AISI 316L
Case:	1.4404/AISI 316L

### Typical Specification:

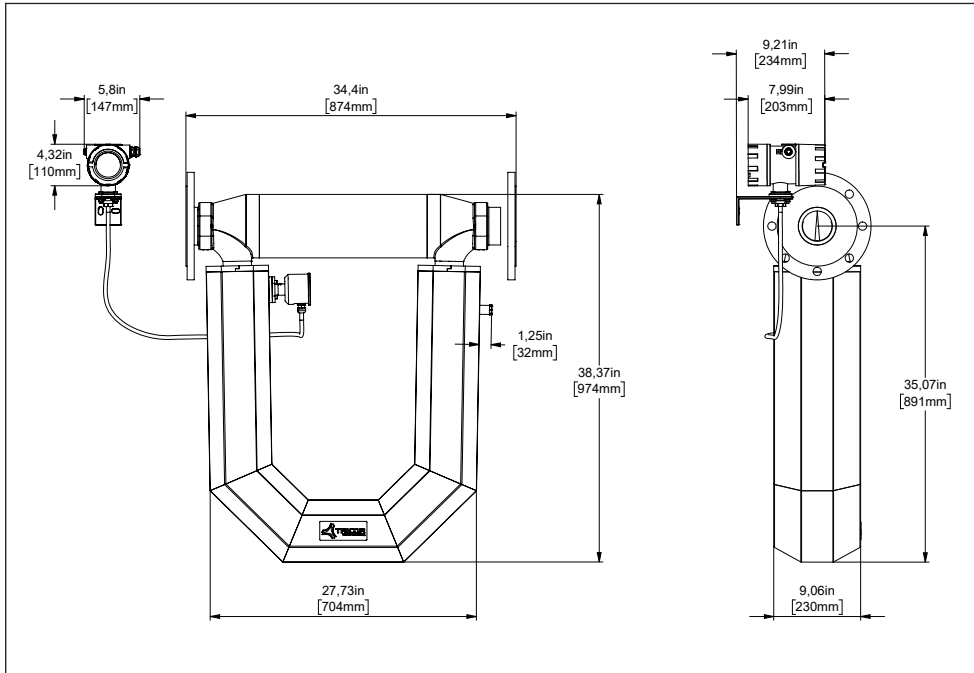
Nominal Meter Size	DN80, 3"
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<sup>1)</sup> Stated flow accuracy combines the effects of repeatability, linearity and hysteresis.

<sup>2)</sup> Ex-Version compact: -40 °C ... +70 °C, -40 °F ... +158 °F.

### Meter Dimensions<sup>3)</sup>:



weight: 87 kg/194.4 lb  
with junction box & remote field mount  
meter connection:  
standard meter connection according table

Model Code	ANSI B16.5 or DIN EN 1092-1 Form B	Face-to-Face [mm] <sup>4)</sup>	Flange - Ø [mm]	Screws QTY	Hole - Ø (for screws) [mm] or screw dim.
AS	3.0" CL 150 ANSI	915	190	4	19
AT	3" CL 300 ANSI	915	210	8	22
AU	3" CL 600 ANSI	915	210	8	22
AW	4" CL 150 ANSI	915	230	8	19
AX	4" CL 300 ANSI	915	255	8	22
DJ	DN80 PN40 EN 1092-1 Form B1	915	200	8	M16
DK	DN80 PN100 EN 1092-1 Form B1	915	230	8	M24
DL	DN100 PN40 EN 1092-1 Form B1	915	235	8	M20

<sup>3)</sup> Drawing of the Meter Dimensions reflects one standard connection, other connections on request (Installation length can vary depending on selected connection).

<sup>4)</sup> Customized face-to face length available.



www.tricorflow.com

N & S AMERICA:

AW-Lake Company  
2440 W. Corporate Preserve Dr. #600, Oak Creek WI 53154, USA, Tel.: +1 414 574 4300

SINGAPORE:

TASI Flow Souteast Asia, Representative Office (RO) Singapore  
1003 Bukit Merah Central #06-32, Singapore 159836, UEN: T15RF0080G, P: +65 6274 1130

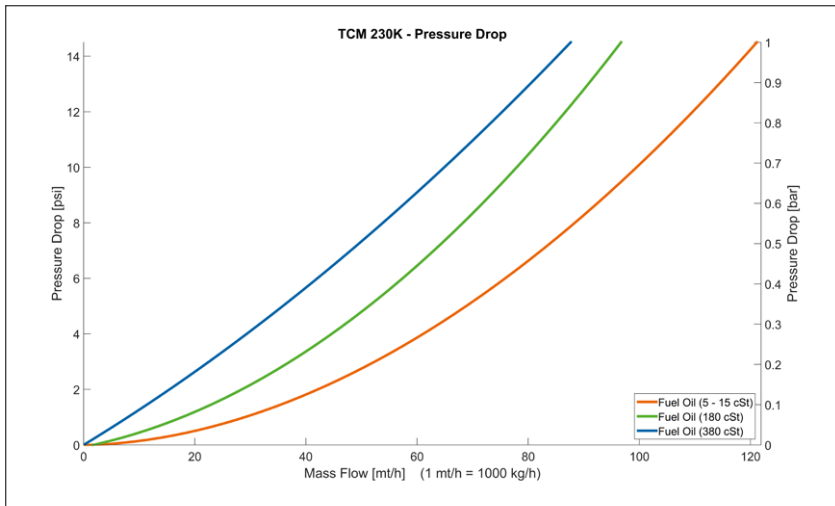
CHINA:

TASI Flow China  
Rm. 2429, JinYuan Office Building, No. 36, CN- BeiYuan Road, Beijing 100012, P.R. CHINA, Tel.:+86 10 520 037 38

Rest of the World:

KEM Küppers Elektromechanik GmbH, Liebigstraße 5, 85757 Karlsfeld, Germany, Tel.:+49 8131 59391-0

## Pressure Drop:



Range	Fuel Oil		
Viscosity [cSt]	5-15	180	380
Density [kg/m <sup>3</sup> ]	900	900	900
Flow Rate [mt/h]	122.0	97.6	88.0
Pressure Drop [bar/psi]	1/14.5		

## Electronics:

The TCE 8000 transmitter offered with the TRICOR Coriolis Mass Flow Meter is also available with other mounting options.

### Panel Mount



Weight: 0.4 kg/0.88 lb

### Remote Field Mount



Weight: 3.8 kg/8.3 lb with 3 m cable

Power Supply: 24 V DC  $\pm$ 20 % or 90 ... 264 V AC  
 Outputs: Analog, Frequency, Pulse, Status  
 Interface: RS485 RTU (Modbus), HART<sup>®</sup>

More options on request

## Ex Certifications:

ATEX (Ex)	Zone 1: Group IIC or IIB, T2...T4
ATEX (Exn)	Zone 2: II 3G Ex nA IIC T2...T4 Gc
IECEX (Ex)	Zone 1: Group IIC or IIB, T2...T4
cCSAus (Ex1) <sup>5)</sup>	Class 1, Division 1: Group A, B, C, D or C, D, T2... T4
ATEX + IECEX + cCSAus triple approval (Ex3) <sup>5) 6)</sup>	Zone 1: Group IIC or IIB, T2...T4 and Class 1, Division 1: Group A, B, C, D or C, D, T2... T4
EAC (TR-CU) <sup>5)</sup>	Group IIC or IIB, T2 ... T4

## Product Type Approval:

American Bureau of Shipping	Certificate Number: 14-HS1223473-PDA-DUP
RMRS	Russian Maritime Register of Shipping

Other Type Approvals in process

<sup>5)</sup> For Ex1, Ex3, EAC (TR-CU) the electronic is only available in aluminum housing.

<sup>6)</sup> Only with remote electronics.