



## CORIOLIS MASS FLOW AND DENSITY METER FOR MARINE FUEL CONSUMPTION MANAGEMENT

- 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) <sup>2)</sup> :	±0.3 % (option: up to ±0.15 %) of flow rate
Repeatability (Mass Flow):	±0.05 % of flow rate
Basic Accuracy (Volume Flow) <sup>2)</sup> :	±0.3 % (option: up to ±0.2 %) of flow rate
Repeatability (Volume Flow):	±0.05 % of flow rate
Zero Stability:	±0.015 % of full scale

### DENSITY

Density Range:	up to 2,500 kg/m <sup>3</sup> [2.5 g/cm <sup>3</sup> ]
Density Accuracy <sup>2)</sup> :	±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:	-40 °C ... +100 °C [-40 °F ... +212 °F] Option: -60 °C ... +200 °C [-76 °F ... +392 °F]
Temperature Accuracy:	±1 °C ±0.5 % of reading [±1.8 °F ±0.5 % of reading]
Temperature Repeatability:	±0.2 °C [±0.36 °F]

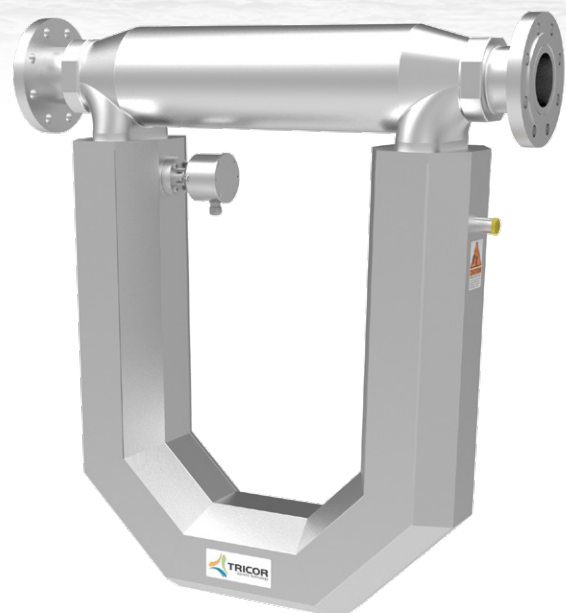
### MATERIALS (WETTED PARTS)

Tubes:	1.4404 [AISI 316L]
Case:	1.4404 [AISI 316L]
Flow Splitter:	CF3M [1.4409]

Option: NACE MR 0175/0103 compliant

### TYPICAL SPECIFICATION:

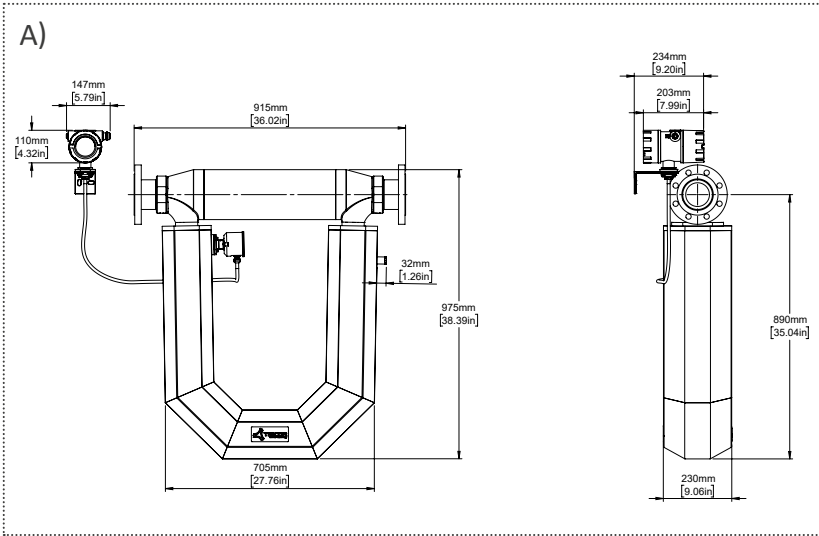
Nominal Meter Size:	DN80 [3"]
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<sup>1)</sup> Stated flow accuracy combines the effects of repeatability, linearity and hysteresis.  
<sup>2)</sup> The specifications refer to standard conditions (for further information see TCM CLASSIC series manual).



# CLASSIC Series | TCM 230K Coriolis Mass Flow Meter



## METER DIMENSIONS<sup>3)</sup> AND WEIGHTS

### A) Remote Version

Weight: 87 kg [191.8 lb]

With junction box and remote field mount

Process Connection:

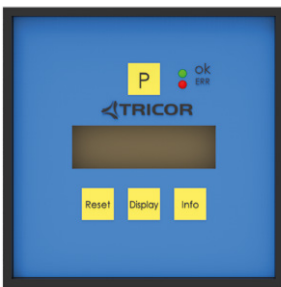
standard meter connection according table

## APPROVALS & CERTIFICATIONS

### Hazardous area (Ex)

ATEX Zone 1 IECEX	<b>Compact version:</b> II 2G Ex db ia IIB T4 Gb <b>Remote version<sup>5)</sup>:</b> Sensor: II 1G Ex ia IIB T4...T2 Ga Transm.: II 2(1)G Ex db [ia Ga] IIB T4 Gb
Atex Zone 2 cCSAus <sup>4)</sup>	<b>All versions:</b> II 3G Ex nA IIC T4 <b>Compact version:</b> Kl. 1, Div. 1, Gruppe C, D: T4 (US, Can) Ex db ia IIB T4 Gb (Can) <b>Remote version<sup>5)</sup>:</b> Sensor: Kl. 1, Div. 1, Gruppe C, D: T4...T2 (US, Can) Ex ia IIB T4...T2 Ga (Can) Transm.: Kl. 1, Div. 1, Gruppe C, D: T4 (US, Can) Ex db [ia Ga] IIB T4 Gb (Can)
EAC (TR-CU)	<b>Compact version:</b> 1Ex d [ia] IIB T4 <b>Remote version<sup>5)</sup>:</b> Sensor: 1Ex ia IIB T4...T2 X Transm.: 1Ex d [ia] IIB T4
KGS (Korean)	<b>Compact version:</b> Ex d [ia] IIB T4 <b>Remote version<sup>5)</sup>:</b> Sensor: Ex ia IIB T4 Transm.: Ex d [ia] IIB T4

### PANEL MOUNT<sup>6)</sup>



### REMOTE MOUNT<sup>7)</sup>



## ELECTRONICS

Power Supply: 24 V DC or 100 ... 240 V AC (version dependent)  
 Outputs: Analog, Frequency, Pulse, Status  
 Interfaces: RS485 RTU (Modbus), HART®  
 Cable Gland: M20 | ½" NPT

### Product Type Approval

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

<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> For cCSAus the electronic is only available in aluminum housing.

<sup>5)</sup> Only wall mounting, not panel mounting.

<sup>6)</sup> Weight: 0.4 kg [0.88 lb].

<sup>7)</sup> Weight with aluminum diecast housing: 3.8 kg [8.4 lb] with 3 m cable, Weight with 1.4404 [AISI 316L] housing: 6.15 kg [13.56 lb].

www.tricorflow.com



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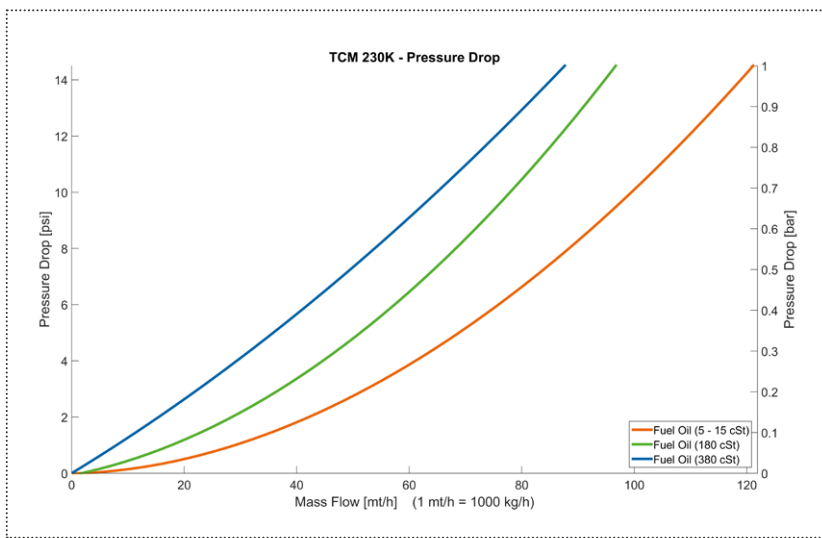
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## PROCESS CONNECTION

Model Code	ANSI B16.5 or DIN EN 1092-1 Form B	Face-to-Face (mm)	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



## 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]		

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