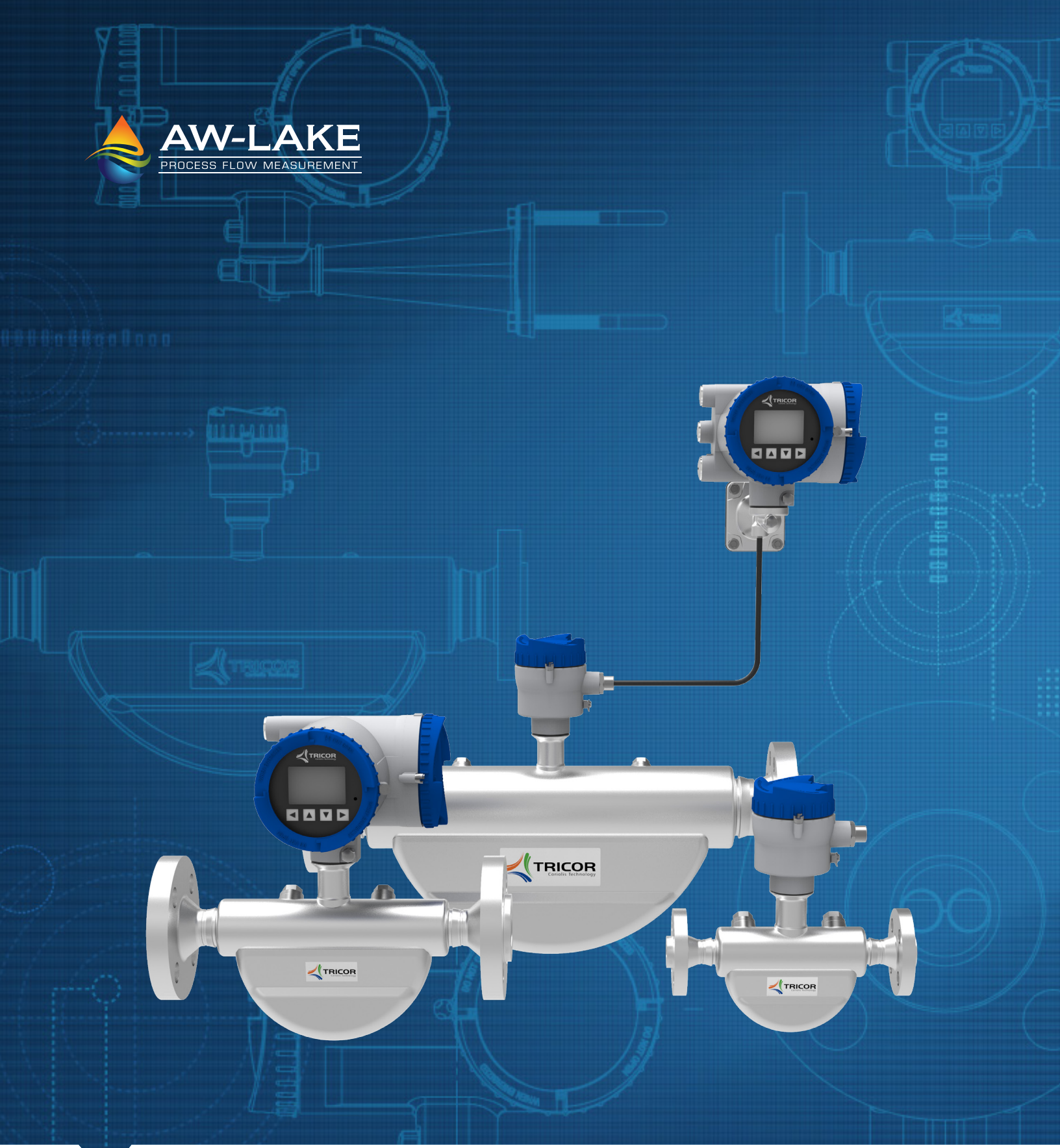
AW-LAKE
PROCESS FLOW MEASUREMENT



TRICOR CORIOLIS MASS FLOW METERS | PRO PLUS SERIES

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ABOUT

This digital flowmeter features market-leading compactness, very high measurement accuracy, low pressure drop, very stable zero point, and first-class data update, with fast 100 Hz signal transmission. Available in three flow meter sizes including ½", 1", and 2", the TCMQ Series of Mass Flow Meters offers a choice of a basic Modbus transmitter or a digital transmitter with remote or local mount.

FEATURES

- Extremely short installation length
- High zero stability for drift-free operation and long-term stability
- Fully welded sensor concept
- High sampling rate (100 Hz), ideal for dynamic process conditions
- Up to four configurable I/Os
- Communication interfaces: HART, PROFIBUS DP1), PROFIBUS PA1), or Modbus RTU RS485
- Smart pump filtering for optimal process noise dampening
- Aerated flow filtering for dual phase or aerated flow conditions
- Full graphical local display (HMI), with 6 user views and trend curves
- SD-Card for memory backup, logging, and documentation storage
- Transmitter adds functionalities such as Standard volume flow, fractions, totalizers, dosing, access control, diagnostics, configuration, and logging
- Modular transmitter design facilitates field service
- USB service interface
- High immunity against process noise

TRICOR FLOW SENSORS | **PRO PLUS SERIES**

The PRO Plus Series of Coriolis Mass Flow Meters presents an accurate and highly repeatable meter with the smallest installation length on the market for installation into systems where space is limited. The TCD transmitter offers greater robustness, performance, diagnostics, and connectivity options. With a modern HMI interface and a strong logging functionality, the DSP transmitters provide users with an efficient configuration and analysis tool.

PRO Plus Series Features:

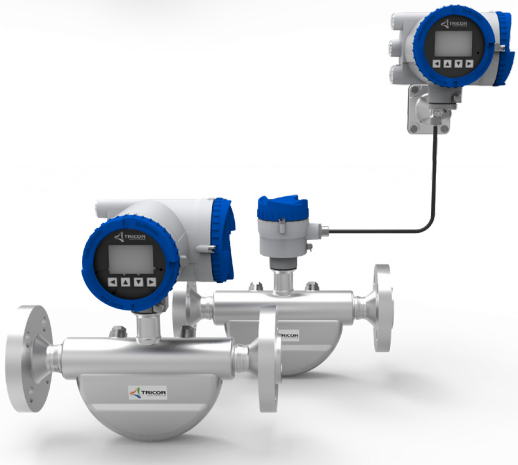
- High dosing accuracy due to short response time (max. 10 ms)
- Suitability for pump monitoring and fast control circuits due to 100 Hz refresh rate
- Extremely short installation length for easy fit in most system configurations
- High zero stability for drift-free accuracy and long-term stability
- Extensive diagnostics and self-monitoring, including empty pipe detection

TCMQ 6400

Mass Flow Rate (max): 235 lb/min, 6400 kg/h
Volumetric Flow Rate (max): 28 gpm, 6400 l/h, 970 bbl/d
Standard Pressure Rating: up to 1450 psi, 100 bar
Nominal Meter Size: 1/2", DN15

TCMQ 018K

Mass Flow Rate (max): 650 lb/min, 17,700 kg/h
Volumetric Flow Rate (max): 78 gpm, 17,700 l/h, 2670 bbl/d
Standard Pressure Rating: up to 1450 psi, 100 bar
Nominal Meter Size: 1", DN25



TCMQ 070K

Mass Flow Rate (max): 2600 lb/min, 70,700 kg/h
Volumetric Flow Rate (max): 311 gpm, 70,700 l/h, 10,700 bbl/d
Standard Pressure Rating: up to 1450 psi, 100 bar
Nominal Meter Size: 2", DN50

TECHNICAL SPECIFICATIONS

FLOW RATE FOR LIQUIDS

Model Number	Max. Flow Rate (water) (Lbs/Min)	(Kg/Hr)	Basic Mass Flow Accuracy (% of flow rate)	Zero Stability (% of full scale)	Repeatability (% of flow rate)
TCMQ 6400	235	6400	±0.1	±0.003	±0.05
TCMQ 018K	650	17,700		±0.01	
TCMQ 070K	2600	70,700			

Density Measuring Range	Density Accuracy	Density Repeatability	Brix Accuracy
0 - 5000 kg/m^3, 5.0 g/cm^3	±5.0 kg/m^3 , ±0.005 g/cm^3 (option: ±0.5 kg/m^3 , ±0.0005 g/cm^3)	±0.25 kg/m^3, ±0.00025 g/cm^3	0.1°Brix (1,000 kg/m^3)

TEMPERATURE

Temperature Repeatability	±0.9°F ±0.25% of reading (±0.5°C ±0.25% of reading)
Temperature Accuracy	±1.8°F ±0.5 % of reading (±1°C ±0.5 % of reading)
Process Temperature (Non Ex)	-76°F ... +392°F (-60°C ... +200°C)
Ambient Temperature	-40°F ... +140°F (-40°C ... +60°C)
Storage Temperature	-40°F ... +158°F (-40°C ... +70°C)

GENERAL

Model Number	Nominal Meter Size (in)	(DN)	Internal Tube Diameter (in)	(mm)	Tube Arrangement
TCMQ 6400	1/2"	DN15	0.31”	8 mm	parallel
TCMQ 018K	1"	DN25	0.55”	14 mm	parallel
TCMQ 070K	2"	DN50	1.1”	28 mm	parallel

Notes: Calibration for Liquids:
The TRICOR flowmeters are always factory calibrated with water.
Calibration Conditions: Water: 68°F ... 77°F (20°C ... 25°C), ambient temperature: 68°F ... 77°F (20°C ... 25°C)
All specifications are based on above mentioned calibration reference conditions, a flow calibration protocol is attached to each instrument.
Stated accuracy combines the effects of repeatability, linearity and hysteresis.
Typical flow dynamics based on max. flow rate is 100:1.
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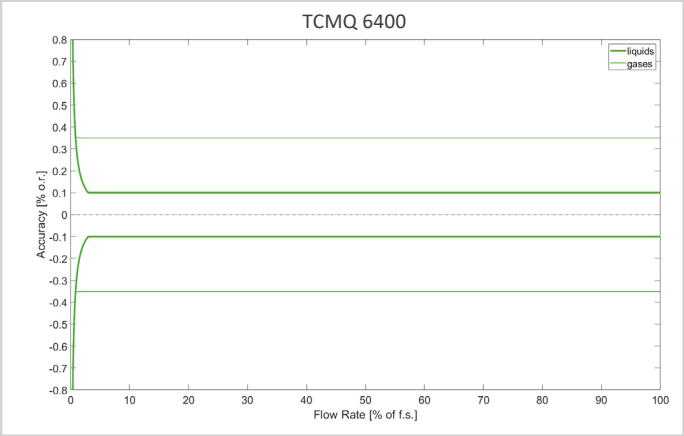
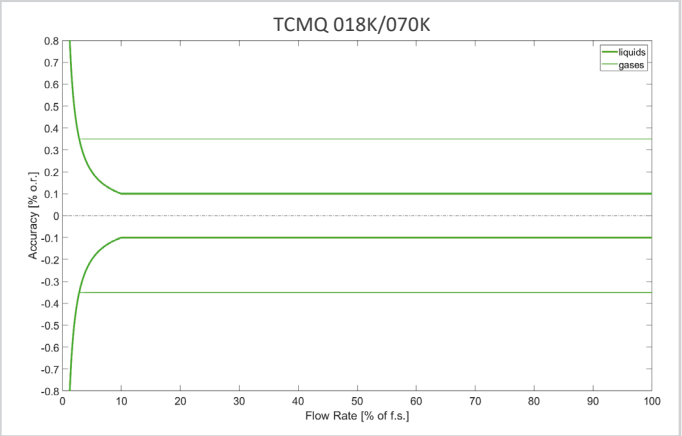
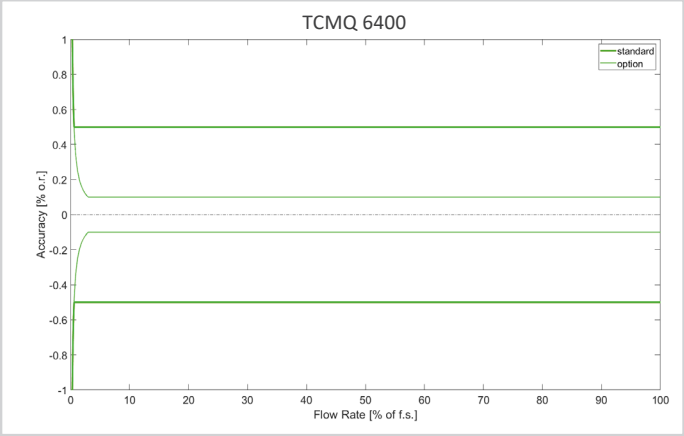
TECHNICAL SPECIFICATIONS

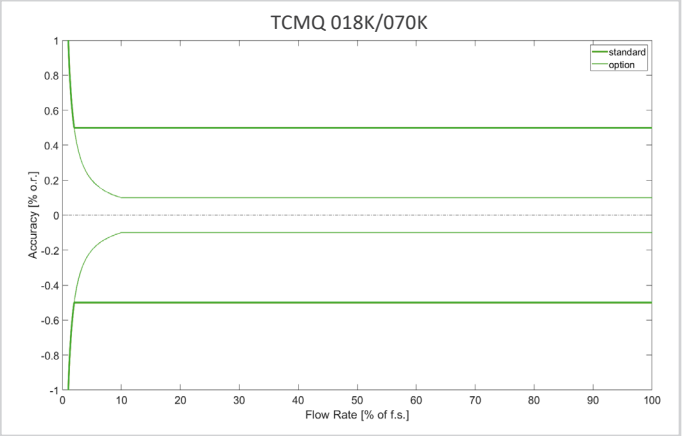
MASS FLOW ACCURACY





VOLUMETRIC FLOW ACCURACY





Flow Rate of Full Scale	Accuracy
>10%	± Base Accuracy
<10%	$\pm \frac{\text{Zero Point}}{\text{Measured Value}} * 100$

CERTIFICATIONS

cCSAus	Class 1, Division 1: Group A, B, C, D or C, D, T2…T6
ATEX	Zone 1: Group IIC or IIB, T2...T6 | Zone 2: II 3G Ex nA IIC T2...T6 Gc
IECEx	Zone 1: Group IIC or IIB, T2...T6

Direct Meter Mount (TCD 9100)

Wall Mount (TCD 9200)

TCD 9100/9200 TRANSMITTER

The TCD 9000 Series Mass Flow Transmitters are equipped with Digital Signal Processing, allowing for fast response, resistance to process vibration/noise, and advanced diagnostics. These transmitters provide a modular Universal I/O configuration with up to 4 fully configurable channels as well as onboard SD card for logging, document storage and traceability functions. The modern, customizable display offers 6 views and trend curves for optimal process monitoring.

Programmable Output Values:
Mass flow, volume flow, total mass, total volume, corrected volume, density, temperature, fraction

Supply Voltage: 20...27 VDC, ±10% or 100...240 VAC, ±10%

Interfaces & IO:

- **Ch1:** RS485 (MODBUS-RTU) is standard, or choice of HART®, Profibus PA, Profibus DP, and 4...20mA
- **Ch2-Ch4:** User-configurable, modular IO cards offer:
  - > Current output (0...20 mA or 4...20mA)
  - > Digital output (pulse, frequency, active)
  - > Digital input (15 ... 30 VDC, 2 ... 15mA)
- **Relay:** Voltage free contact, 30 VAC, 100mA
- **Wireless Option:** SignalFire wireless mesh network (external connection to Modbus or 4...20 mA)

Protection Class: IP67/NEMA 4X

Hazardous Area Approvals:

- cCSAus – Class 1, Div. 1, Groups A, B, C, D or C, D, T2...T4
- ATEX – Zone 1: Group IIC or IIB, T2...T6; Zone 2: II 3G Ex nA IIC T2...T4 Gc
- IECEx – Zone 1: Group IIC or IIB, T2...T4

Graphic Display: 240x160px, 6 programmable views

TCD 9010 TRANSMITTER

The TCD 9010 electronic transmitter is a direct meter mount solution that is perfect for space constrained applications (such as Marine). This offering is a highly robust minimal footprint supporting Modbus only interface without display and without modular I/O options.

Supply Voltage: 12 ... 27 VDC

Power Consumption: 1.1 W

Interface: Modbus RTU

Cable Gland: 1/2" NPT (M20 on request)

Housing Material: Aluminum

Hazardous Area Approvals:

- cCSAus – Class 1, Div. 1, Groups A, B, C, D or C, D, T2...T4
- ATEX – Zone 1: Group IIC or IIB, T2...T4; Zone 2: II 3G Ex nA IIC T2...T4 Gc
- IECEx – Zone 1: Group IIC or IIB, T2...T4

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