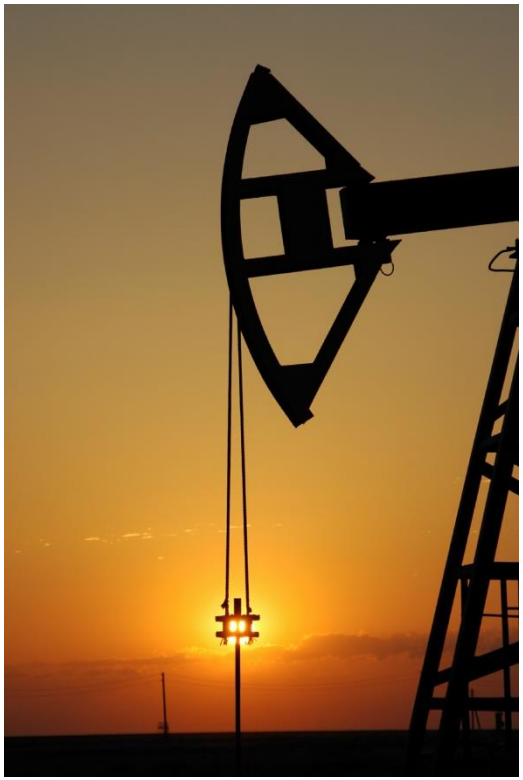
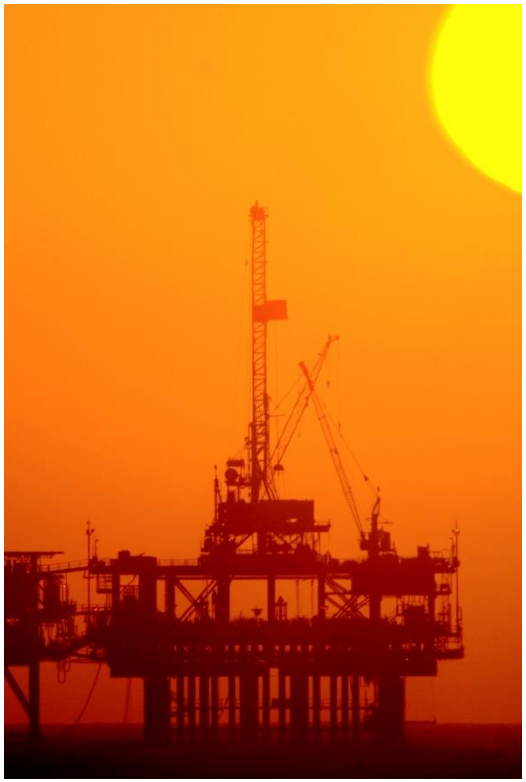
SALES RELEASE:

TCMH 0450 for High Pressure Liquids & Gases





Overview Liquids

High Pressure Liquids

- Pressure Rating (Code)
  TCMH 0450-HC-SPOS 15,200 psi (1,050 bar)
  TCMH 0450-HC-SROS 10,000 psi (690 bar)
  TCMH 0450-HC-SSOS 6,000 psi (414 bar)
- Flow Range 0.165-16.5 lb/min (4.5-450 kg/h)
- Flow ±0.2% of reading
- Mass Repeatability ±0.1% of reading
- Zero Stability ±0.075% of f. s.

NACE Compliance

- NACE MR0175/MR103

Mass Flow Meter

- Not available to date for Density and Volume Flow Measurement (under test)

Overview Gases

High Pressure Gases

- Pressure Rating (Code)
  TCMH 0450-HC-SPPS (or -SPMS) 15,200 psi (1,050 bar)
  TCMH 0450-HC-SRPS (or -SRMS) 10,000 psi (690 bar)
  TCMH 0450-HC-SSPS (or -SSMS) 6,000 psi (414 bar)
- P for 1.4404/AISI 316L = NACE compliant, M for HP160 = not NACE compliant
- Max. Flow rate — see datasheet
- Flow — ±1% of reading
- Mass Repeatability — ±0.5% of reading
- Zero Stability — 0.0165 lb/min (0.45 kg/h)

NACE Compliance

- NACE MR0175/MR103

Mass Flow Meter

- Not available to date for Density and Volume Flow Measurement (under test)

TCMH 0450 Quick Overview

Operating Conditions – Process

(Customer specific pressure compensation curves on request)

- Medium Temperature -40°F to +212°F (-40°C to +100°C)

Operating Conditions – Environment

- Ambient Temperature -40°F to +158°F (-40°C to +70°C)
- Relative Humidity max. 95%

TCMH 0450 Quick Overview

Output Signals

• Analog	Two 4-20 mA passive two-wire, galvanic free Accuracy ±0.05% of f. s. Temperature drift 0.05% per 10 K Load < 620 Ω (with 24 V supply) Output value programmable
• Frequency/Pulse	5-10,000 Hz/Active Push-Pull for flowrate
• Status	Push-Pull programmable

Input Signals

• Control Input	0/24 V DC
• Analog (optional)	4-20 mA active for passive Two-wire-pressure sensor
• Interface	RS485 RTU (Modbus) HART®

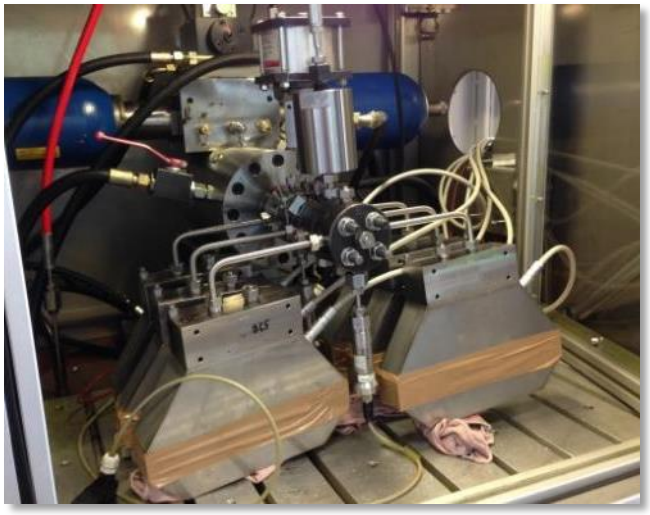
TCMH 0450 Quick Overview

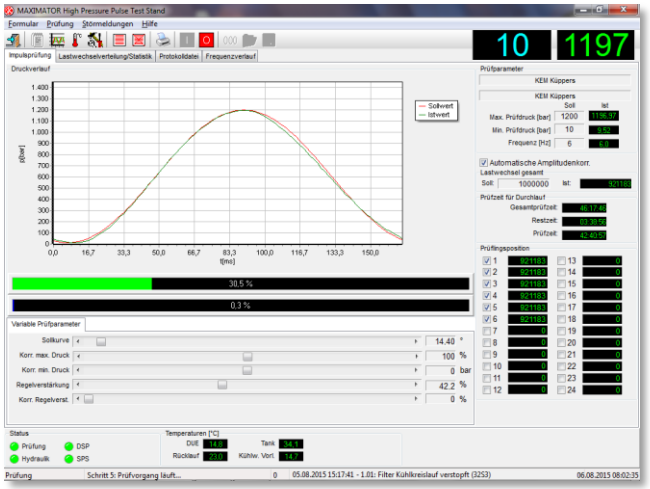
Ex-Certifications

• cCSAus (Ex1)	Class I, Division 1: Group A, B, C, D, T2 to T4
• ATEX (Ex)	Zone 1: Group IIC T2 to T4
• ATEX (Exn)	Zone 2: II 3G Ex nA IIC, T2 to T4 Gc
• IECEx (Ex)	Zone 1: Group IIC T2 to T4
• ATEX + IECEx + cCSAus triple approval (Ex3)	Zone 1: Group IIC T2 to T4+ cCSAus: Class 1, Div. 1: Group A, B, C, D, T2 to T4

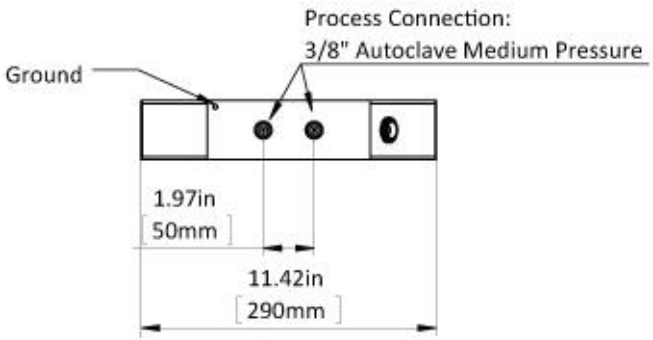
Dynamic Pressure Test TCMH 0450

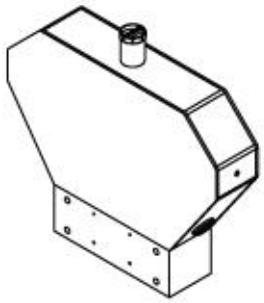
- Pressure stress variation Δp
- P_{max} = 17,404 psi (1,200 bar)
- P_{min} = 145 psi (10 bar)
- Frequency f = 6 Hz
- 1,000,000 load cycles were given
- The pressure directive 2014/68/EU recommends for dynamic pressure testing of high pressure tanks, a test pressure of 1.25 times of the nominal pressure in bar. Limit of dynamic pressure test facility was at 17,404 psi (1,200 bar).
- Final internal test procedure comprises a 29,000 psi (2,000 bar) static pressure test.
- All tests passed successfully.

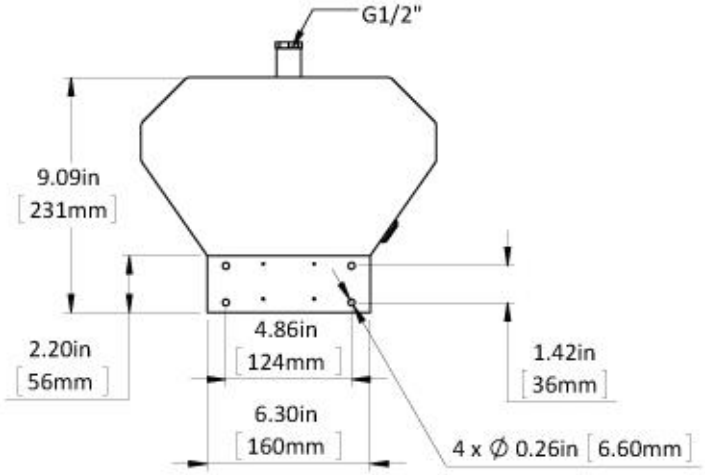


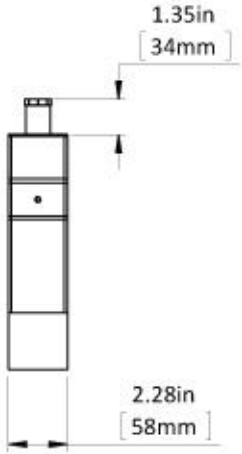


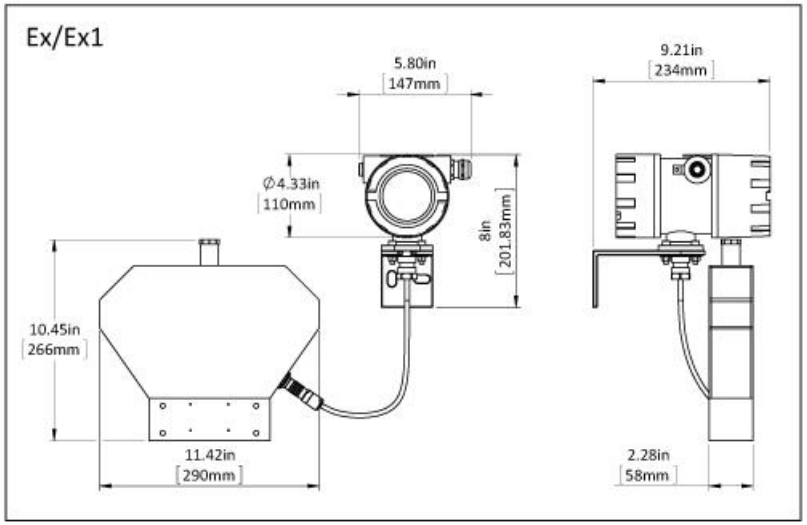
Drawing & Ex-Connections

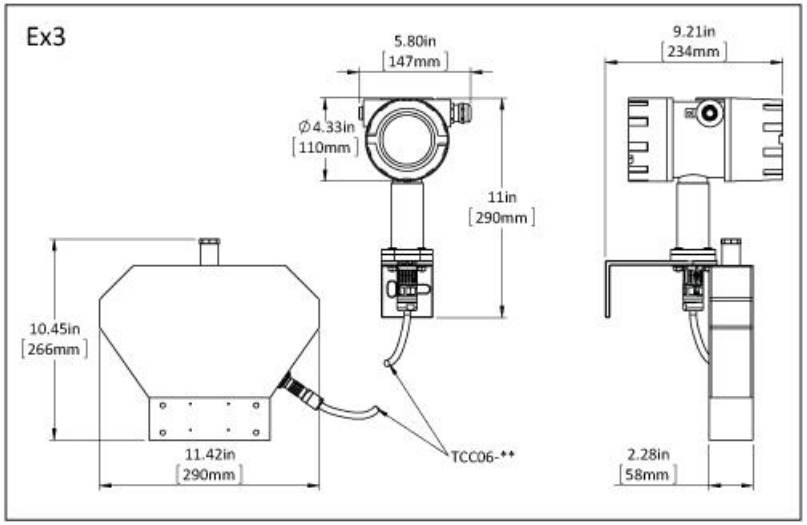












Applications & Competitors

- General Flow Control
- Chemical Injection
- High Pressure Gas Dispensing
- Additive Dosing
- Test benches for high pressure injections (Gas & Liquids)

Manufacturer	Meter Type	Design Pressure	Qmax	Accuracy o. r.	Available
AW-Lake / KEM	TCMH 0450	15,200 psi(1,050 bar) 10,000 psi (690 bar) 6,000 psi (414 bar)	16.5 lb/min (450 kg/h)	0.2 % Liquids 1.0 % Gas	Yes
MM	HPC010P	15,000 psi (1,034 bar)	3.7 lb/min (100 kg/h)	0.2 % Liquids	No
Rheonik	RHM04PH	12,618 psi (870 bar)	22.05 lb/min (600 kg/h)	0.2 % Liquids 0.5 % Gas	Yes
Heinrichs	TM various	up to 15,200 psi (1,050 bar)	Various	0.2 % Liquids 0.5 % Gas	Yes

others
OVAL
Bronkhorst
Brooks

Succesful Installation

First stage with *LEMO Connector

*Material: Chrome plated brass shell

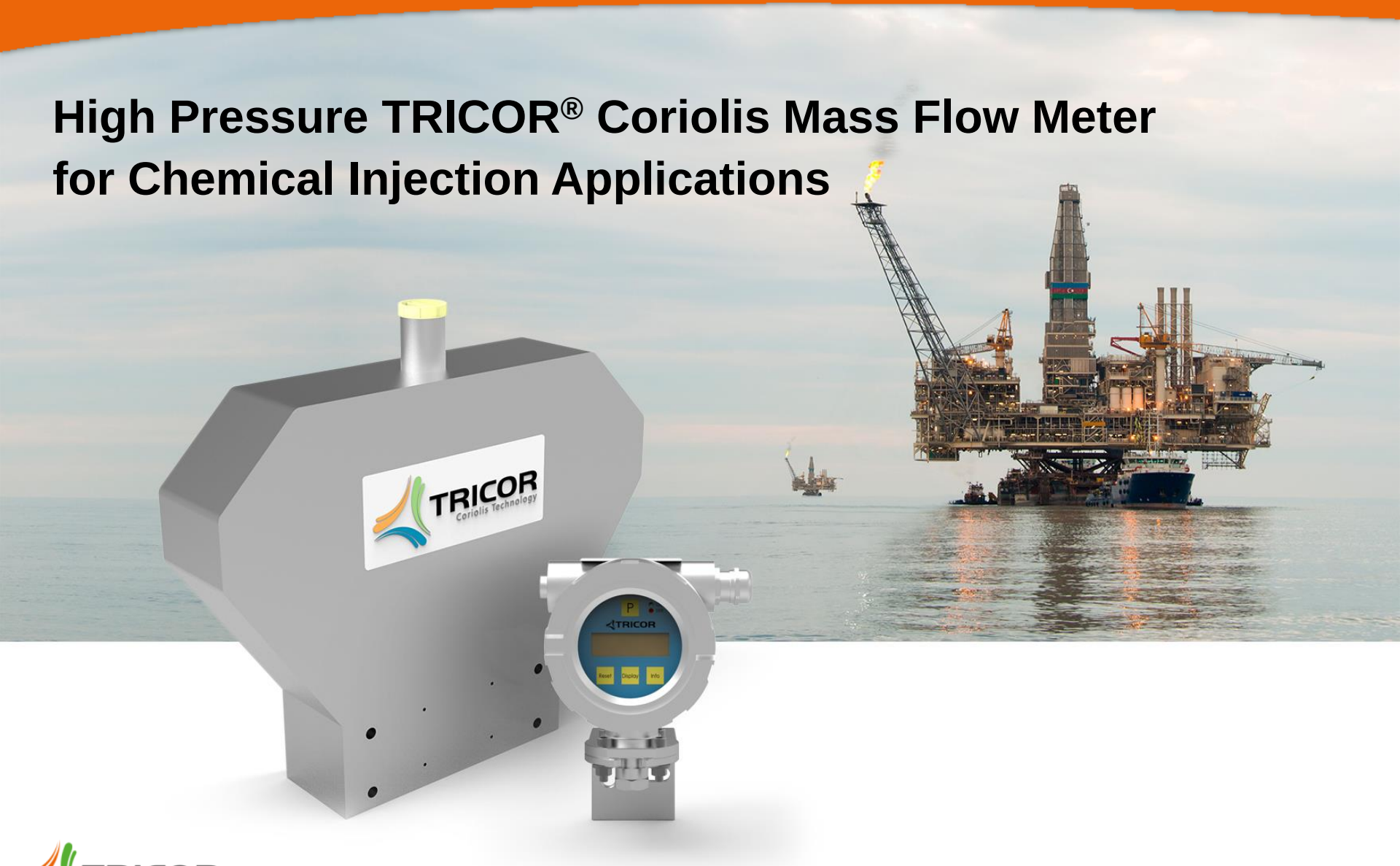
Linde Engineering

High Pressure Hydrogen

Pressure rating: 15,200 psi (1,050 bar)
Operating pressure: 290-12,690 psi (20-875 bar)

Typical Application

High Pressure TRICOR® Coriolis Mass Flow Meter for Chemical Injection Applications



Typical Application

High Pressure Chemical Injection

In the oil & gas industry, chemical injection is widely employed to prevent scaling, corrosion or hydrate plugging in pipelines, pumps and other critical onshore and offshore assets.

Examples of chemicals include:

- Methanol to prevent hydrate formation
- Glycol (MEG/TEG) for gas dehydration

Typical Density and Viscosity Ranges

- 6.67 lb/gal (0.8-1.2 kg/l)
- 0.6-30 cSt or higher

Offshore Requirement

Available Soon

Ex Cable Gland (316 L)

G 1/2“ or 1/2“ NPT Burst Protection Connection

Documents & Tools

Datasheets

- TCMH_G_0450_F_EN_160826_E001.pdf
- TCMH_L_0450_F_EN_160826_E001.pdf

Manual

- In process

Sizing

- TCM_sizing program_2.4.exe (available on request)

Model Code Configurator

- PL TRICOR 2016_151215_E001.5.xlsm (available on request)

Website

- www.tricorflow.com

TASI Group

Take advantage of our strong Global Flow Solution Network with competences in a diversified line-up of flow measurement technologies.

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