FAURE HERMAN
Counting every Drop

HELIFLU™ TZN

The Original Helical Turbine Flowmeter for Custody Transfer Measurement

PROVEN PERFORMANCE

The **Heliflu™ TZN** flowmeter is designed for high accuracy measurement of liquids from very light LPG products to heavy crude oils.

The advanced design and robust construction with thousands of available configurations enable the **Heliflu™ TZN** flowmeter to be used in the widest and most demanding applications.

Its engineered rotor offers superior linearity and excellent repeatability making it the obvious choice for custody transfer measurement for more than 40 years.

Key Benefits
Proven robust technology
Superior linearity and repeatability over a wide usable range
Minimal sensitivity to density and viscosity variations
Long term stability and reliability
Low cost of ownership
Low downtime – Customer serviceable
Easy to prove – Ideal solution for Master Meters
Suitable for high viscosities (greater than 1,000 cSt)
Measure multiple products with a single Kfactor
Low pressure drop and energy consumption
Advanced materials and patented design for severe duty
Complies with global certifications and standards
Calibrated on customer specified viscosities
Manufactured by a company with 90+ years of metering experience

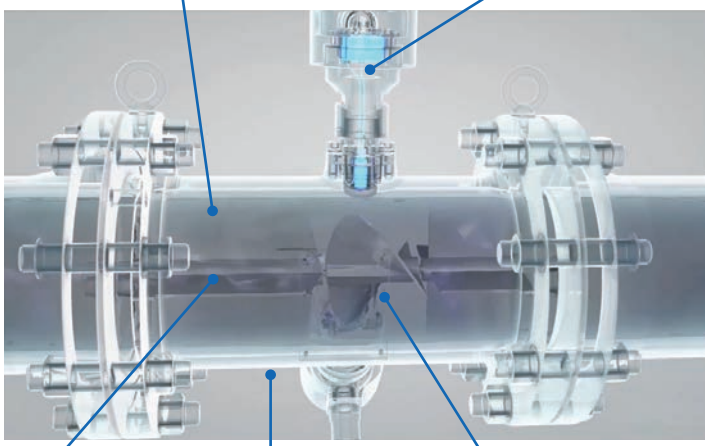
Product applications

Custody transfer measurement
Oil production allocation
FSO & FPSO metering
Storage management
Pipeline measurement
Marine terminal &Tanker loading/offloading
Leak detection
Master metering

ACCURATE MEASUREMENT FOR SUPERIOR MANAGEMENT

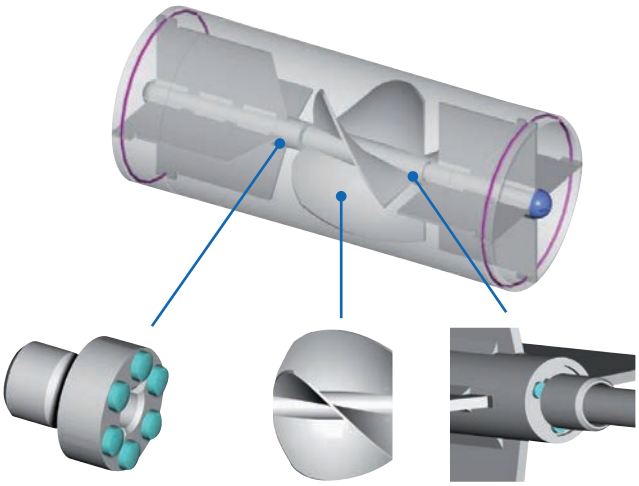
The Heliflu™ flowmeter accurately measures your product! As the liquid hydrocarbons move through the meter, the fluid rotates the helical rotor at a speed directly proportional to its flow rate. Each revolution corresponds to a precise volume of liquid.

Magnets mounted in the rotor induce electrical pulses in an adjacent pick up coil. These resulting pulse frequency occurs in relation to the flow.



- Designed for severe conditions: profiled rotor and engineered shapes for minimum flow disturbances
- Titanium rotor and stainless steel cartridge for high corrosion resistance
- Tungsten carbide bearings designed to offer durability and long service life

PATENTED HELIFLU™ TZN CUS FOR DIFFICULT LIQUIDS WITH DRA, PARAFFINS, FIBERS, SEDIMENTS AND MORE!



TZN CUS Cartridge

The Heliflu™ TZN CUS minimizes the effect of liquids mixed with DRA, wax, fibers, chalk, etc. Most metering solutions are negatively affected by the presence of such contaminants, reducing performance and significantly increasing operating costs.

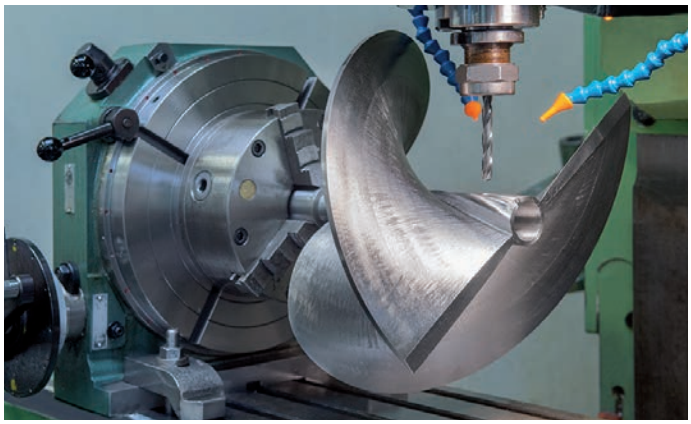
The patented TZN CUS design with its rotor and specific bearing design allows you to rest assured that your product will continue to flow.

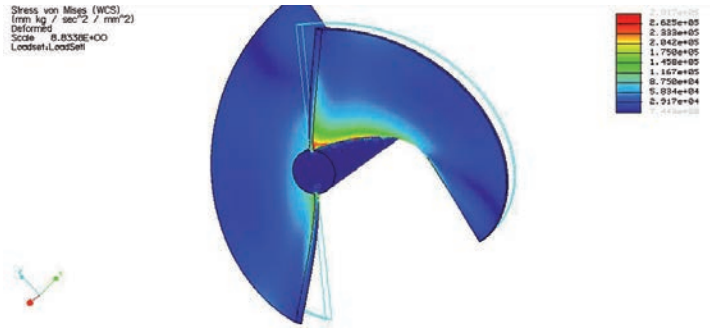
The CUS cartridge is interchangeable with a Standard Cartridge

AN IMPROVED ROTOR FOR SUPERIOR PERFORMANCE AND RELIABILITY

With the Faure Herman helical rotor, fluid velocity is parallel to the blade, making it less sensitive to viscosity and density variation.

The rotor is manufactured from one solid block (no welded parts) of either titanium or aluminum. This design is based on detailed engineering analysis and increases reliability and performance.





The helical rotor shape and rounded front edge, combined with light weight material improves stability and linearity even at high viscosity, while reducing wear on bearings.

Rotors are designed and optimized during in-house calibration to fit the final application requirements.

REMOVABLE CARTRIDGE FOR EASY MAINTENANCE

Faure Herman TZN meters utilize a removable calibrated cartridge inserted into the body.

The Faure Herman cartridge principle offers:

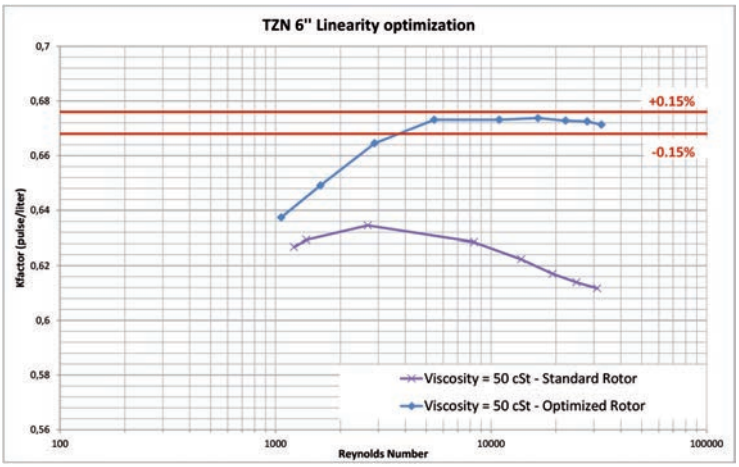
- Easy replacement of internals ➜ Less than 5 min
- Limited downtime & interruption of service
- Time and money savings
- Interchangeable spare cartridges are calibrated for easy maintenance
- Ability to send only the cartridge for recalibration
- Ability to rebuilt & refurbish meters with just a few parts

REAL VISCOSITY CALIBRATION AND ROTOR OPTIMIZATION

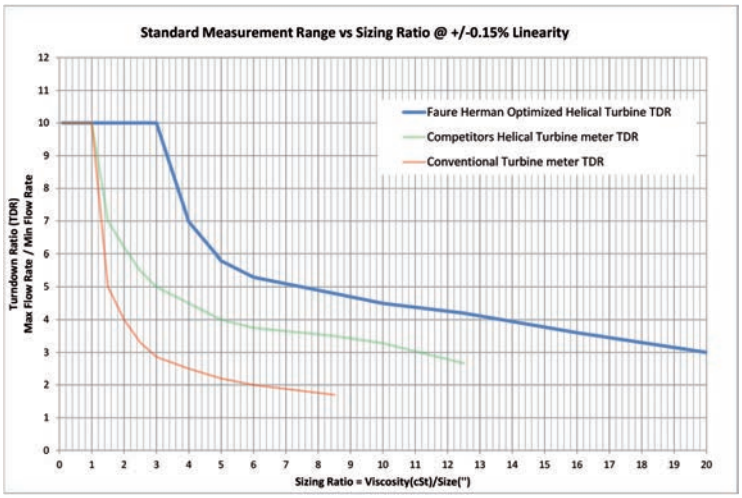
The Heliflu™ TZN flowmeter is calibrated at Faure Herman's ISO 17025 calibration facility with viscosities from 0.6 cSt up to 1,000 cSt.

The ability to calibrate at actual viscosity ensures the meter will perform as expected in real operating conditions.

By calibrating on customer specified viscosities, Faure Herman can adjust and optimize the rotor to improve linearity and increase the measurement turndown ratio.



Increase your Operating Flow Range by using a Heliflu™ TZN :



Because Faure Herman calibrates at the actual viscosities of the application and optimizes the rotor, Heliflu™ TZN flowmeters offer a wider operating flow range than other Helical or Conventional Turbine flowmeters.

The **Sizing Ratio**, which is viscosity (cSt) divided by size (inch), is much higher on Heliflu™. Other helical meters limit their Sizing Ratio to 10 (or above the Reynolds number of 10,000).

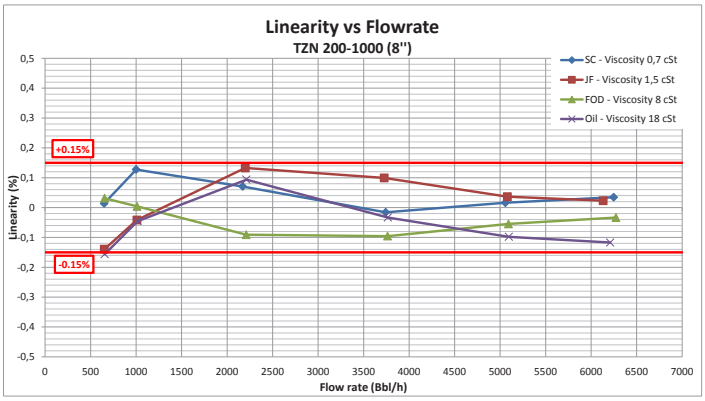
Through optimizing the rotor, Heliflu™ TZN flowmeter can use a single K factor for multiple product applications over a wider range of viscosities and flow rates than other helical turbine meters.

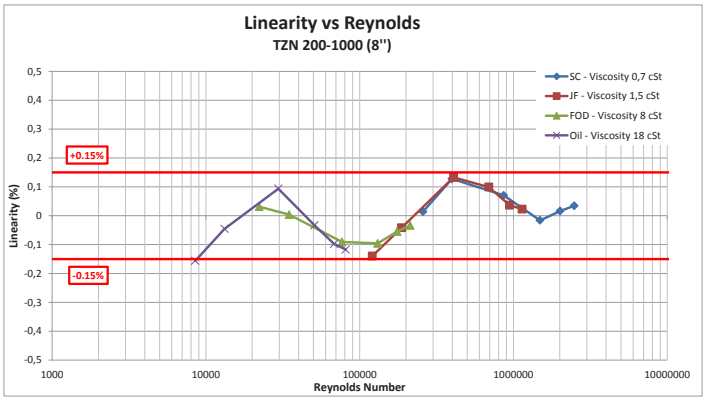
To increase your operating capabilities, choose the original Heliflu™ TZN flowmeter

HIGH PERFORMANCE: LINEARITY AND REPEATABILITY

Linearity

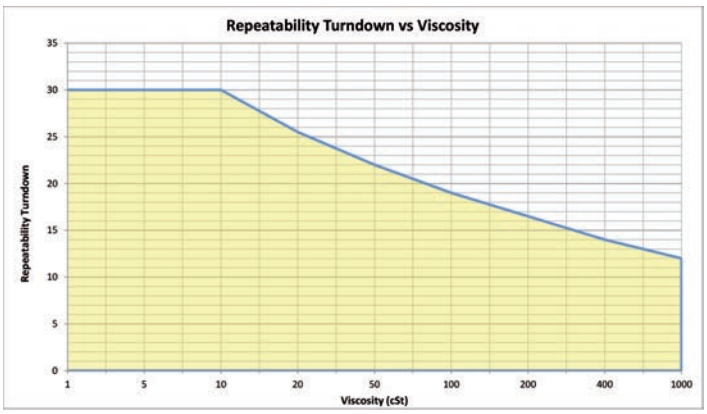
±0.15% over the defined turndown range (±0.10% on approved applications)
Linearity with a single Kfactor on multiple products.





Repeatability

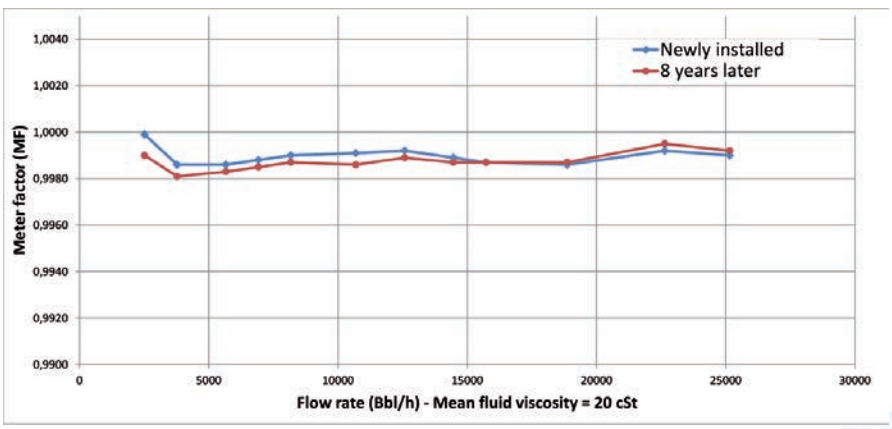
Better than 0.04% (±0.02%) on a wide measurement range up to 30:1 repeatability turndown ratio.
According to API MPMS and OIML R117-1.



Master Meter

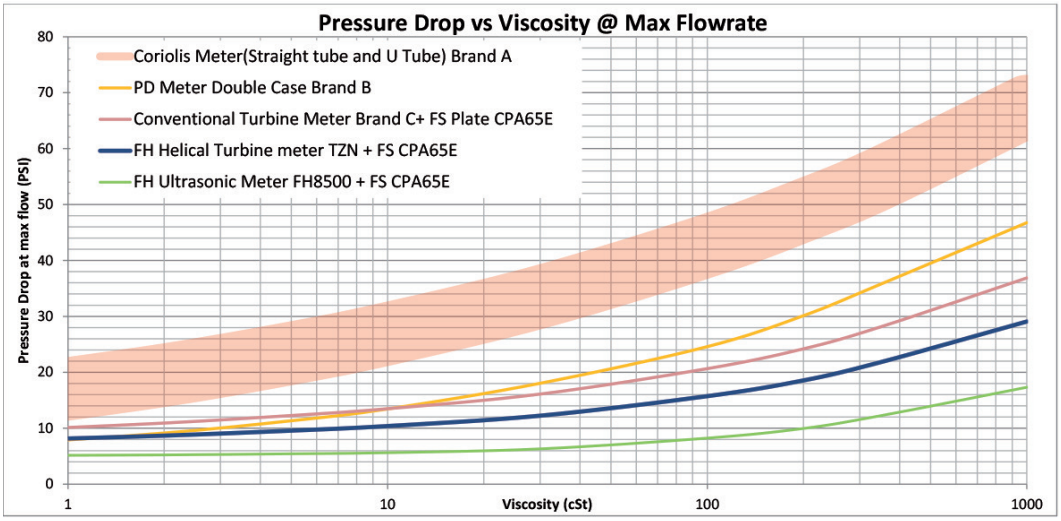
Due to its Helical Technology, the Heliflu™ TZN flowmeter can be easily used as a **Master Meter**, showing a high level of repeatability (<0.04% over 5 runs to get uncertainty <±0.027%) as required by API MPMS 4.5 for master meter applications.

LONG TERM PERFORMANCE STABILITY



The Heliflu™ TZN flowmeter offers very long term performance stability.

LOW PRESSURE DROP AND MINIMUM BACK PRESSURE



Heliflu™ TZN flowmeters have a very low pressure drop compared to other technologies, even with a flow straightener.

As a low pressure drop meter, the Heliflu™ TZN saves you money.

Pressure drop across the Heliflu™ TZN flowmeter can be estimated by the equation:

$$\Delta P = 3.6 \cdot d \cdot v^{0.2} \cdot \left(\frac{Q}{Q\ \max}\right)^2$$

With
ΔP: Meter Pressure Drop (PSI)
d: Specific Gravity
v: Kinematic viscosity (cSt)
Q: Operating flowrate (bbl/h)
Qmax: Meter maximum flowrate (bbl/h)

Back pressure

To prevent cavitation in the meter, the minimum back pressure should be calculated using the equation:

$$Pback \geq 2 \cdot \Delta P + 1.25 \cdot Pv$$

According to API MPMS 5.3

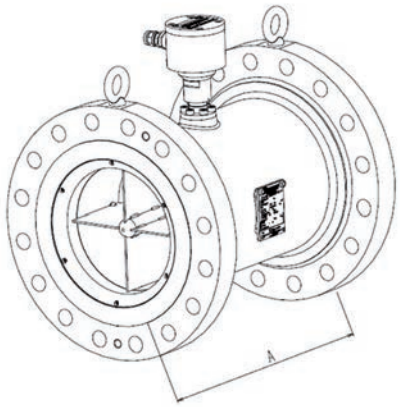
With
Pback: Gauge back Pressure (PSIg)
ΔP: Meter Pressure Drop at max flowrate (PSI)
Pv: Absolute Vapor pressure at max temperature (PSIa)

EASY TO INSTALL

The Heliflu™ TZN flowmeter features a plug and play design. More compact than other technologies, it can be installed either horizontally or vertically (flow upwards) and can handle flow in both directions.
The Heliflu™ TZN flowmeter is available and certified in two electrical protection modes for hazardous areas : Explosion Proof or Intrinsically Safe. It also features an easy interface and can work with any flow computer.
A flow conditioning element is recommended upstream of the meter.
Please consult Faure Herman and the installation manual for full installation instructions.

UNITS & DIMENSIONS

Material of Construction	
Body and Flanges	Carbon Steel or Stainless Steel ***Options***: Low Temp Carbon Steel or Duplex (Other upon request)
Internals	
Cartridge	**316L Stainless Steel** , Titanium (optional)
Rotor	**Titanium** or Aluminium
Bearings	**Tungsten Carbide** or Graphite
Electrical Enclosure	**316 Stainless Steel** or Aluminium
Options	Compliance to NORSOK, NACE,…



Size		Model	Nominal Flow range Min/Max				Typical K factor		Filtration	Meter length (A)*		Approx. meter weight	
inch	mm		m^3/h		bbl/h		pulse/m^3	pulse/bbl	mm	inch	mm	kg	lbs
½	16	TZN 16-012	0.012	0.12	0.075	0.75	5200 P/l	19700P/Gal	0.2	5.125	130	3.5	8
½	16	TZN 16-025	0.025	0.25	0.157	1.57	2600 P/l	9850P/Gal	0.2	5.125	130	3.5	8
¾	20	TZN 20-05	0.05	0.5	0.314	3.14	1600 P/l	6060P/Gal	0.25	5.125	130	4	9
¾	20	TZN 20-1	0.1	1	0.63	6.3	415 P/l	1572P/Gal	0.25	5.125	130	4	9
1	25	TZN 25-2	0.2	2	1.3	13	125 P/l	473P/Gal	0.25	5.125	130	5	11
1	25	TZN 25-3	0.3	3	2	20	125 P/l	473P/Gal	0.25	5.125	130	5	11
1	25	TZN 25-5	0.5	5	3	30	125P/l	473P/Gal	0.25	5.125	130	5	11
1	25	TZN 25-10	1	10	6.3	63	125 P/l	473P/Gal	0.25	5.125	130	5	11
1 ¼	32	TZN 32-8	0.8	8	5	50	38 P/l	145P/Gal	0.13	5.5	140	6	13
1 ¼	32	TZN 32-12	1.2	12	7.5	75	29 P/l	110P/Gal	0.3	5.5	140	6	13
1 ¼	32	TZN 32-15	1.5	15	9.4	94	18 P/l	68 P/Gal	0.3	5.5	140	6	13
1 ¼	32	TZN 32-20	2	20	12.6	126	18 P/l	68 P/Gal	0.3	5.5	140	6	13
1 ½	40	TZN 40-8	0.8	8	5	50	38 P/l	145P/Gal	0.3	5.5	156	7	15
1 ½	40	TZN 40-12	1.2	12	7.5	75	29 P/l	110P/Gal	0.3	5.5	156	7	15
1 ½	40	TZN 40-15	1.5	15	9.4	94	18 P/l	68 P/Gal	0.3	5.5	156	7	15
1 ½	40	TZN 40-20	2	20	12.6	126	18 P/l	68 P/Gal	0.3	5.5	156	7	15
1 ½	40	TZN 40-40	4	40	25	250	18 P/l	68 P/Gal	0.3	5.5	156	7	15
2	50	TZN 50-30	3	30	19	190	20 P/l	75 P/Gal	0.5	7	180	12	26
2	50	TZN 50-50	5	50	32	320	12 P/l	45 P/Gal	0.5	7	180	12	26
2	50	TZN 50-70	7	70	44	440	12 P/l	45 P/Gal	0.5	7	180	12	26
3	80	TZN 80-70	7	70	44	440	5000	795	1.0	9.25	235	20	44
3	80	TZN 80-110	11	110	69	690	5000	795	1.0	9.25	235	20	44
3	80	TZN 80-150	15	150	94	943	5000	795	1.0	9.25	235	20	44
4	100	TZN 100-200	20	200	126	1260	2050	326	1.5	12	305	25	55
4	100	TZN 100-300	30	300	186	1890	1600	254	1.5	12	305	25	55
6	150	TZN 150-400	40	400	252	2520	900	143	1.5	14	356	45	99
6	150	TZN 150-600	60	600	377	3770	650	103	1.5	14	356	45	99
8	200	TZN 200-800	80	800	503	5030	380	60	2.0	16	406	75	165
8	200	TZN 200-1000	100	1000	629	6290	380	60	2.0	16	406	75	165
8	200	TZN 200-1200	120	1200	755	7550	380	60	2.0	16	406	75	165
10	250	TZN 250-1200	120	1200	755	7550	150	23	2.0	20	508	115	253
10	250	TZN 250-2000	200	2000	1260	12600	150	23	2.0	20	508	115	253
12	300	TZN 300-2400	240	2400	1510	15100	90	13	3.0	24	610	190	419
12	300	TZN 300-3000	300	3000	1890	18900	90	13	3.0	24	610	190	419
14	350	TZN 350-3500	350	3500	2200	22000	70	11	3.0	28	711	210	463
16	400	TZN 400-4000	400	4000	2520	25200	50	8	3.0	32	813	295	650
16	400	TZN 400-4500	400	4500	2830	28300	50	8	3.0	32	813	295	650
18	450	TZN 450-4800	480	4800	3020	30200	40	6.5	5.0	36	914	385	849
18	450	TZN 450-5500	550	5500	3460	34600	40	6.5	5.0	36	914	385	849
20	500	TZN 500-6000	600	6000	3780	37800	30	5	5.0	40	1016	400	882

**This information is for ANSI 150 flange rating. For other ratings, please consult Faure Herman.*

Available in CUS model

MATERIAL SPECIFICATION

Meter Specification	
Meter Size **Flange Rating**	½" to 20" ANSI 150 to ANSI 2500 (ASME B16.5)*
Pick up coil **Sensor type** **Preamplifier**	1 or 2 (3 available on request) Inductive coil 2 wires, 2 wires NAMUR 3 wires Open Collector
Optional	Local totalizer available (upon request)

**Consult factory for higher pressure or other flange types*

Performances	
Linearity	±0.15% (±0.10% on premium)
Repeatability	<0.04% (<0.02% on premium)
Max flow rate	0.12 to 6,000 m^3/h (0.75 to 37,800 bbl/h)
Viscosity range	0.2 to 350 cSt (higher upon request)

Meter Temperature Range		
	ATEX/IECEx	**UL/cUL**
Ambient Temperature	-50°C to +80°C (-58°F to +176°F)	-50°C to +80°C (-58°F to +176°F)
Process Temperature	-50°C to +180°C * (-58°F to +356°F)	-50°C to +150°C (-58°F to +302°F)
Ingress Protection	IP66	NEMA 4X
Storage Temperature	-50°C to +60°C (-58°F to +140°F)	

**Higher temperature option available*

Meter Approvals	
Electrical	ATEX and IECEx (II2G – IIC T6) UL/cUL (Class 1 Div 1 Group C, D)
Pressure **Environment** **Metrology**	PED directive compliant EMC directive compliant OIML R117-1 MID (Class 0.3) And other national approvals (upon request)

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