



OPTIMASS 7050 CT Technical Datasheet

Custody Transfer Mass Flowmeter with single straight measuring tube

OIML R117 Pattern Approval

Accuracy classes 0.3 / 0.5 / 1.0 / 1.5

Applications

- Oil, oil products
- LNG (propane / butane) loading for rail cars and tank trucks
- Chemical and petrochemical industry
- Robust and reliable with simple installation gives low 'whole life cost of ownership'.
- Five sizes available allow best meter selection for accuracy and pressure loss calculations.

Highlights

- Accuracy class 0.3
The first Single Straight Tube mass flowmeter to achieve this.
- With secondary containment ratings to 100 bar / 1450 psig, this is the preferred meter for hazardous applications.





Example of application: Liquefied natural gas unloading from rail car

Technical Data

Flow rate	T15	T25	T40	T50	T80	
Nominal flow rate [kg/h]	11250	34500	91500	180000	430000	
Nominal flow rate [lbs/min]	400	1250	3300	6600	15800	
Flow range [Class 0.3]	kg/h	11250 ... 1125	34500 ... 3450	91500 ... 9150	180000 ... 18000	430000 ... 43000
	lbs/min	400 ... 40	1250 ... 125	3300 ... 330	6600 ... 660	15800 ... 1580
Flow range [Class 0.5]	kg/h	11250 ... 563	34500 ... 1725	91500 ... 4575	180000 ... 9000	430000 ... 21500
	lbs/min	400 ... 21	1250 ... 21	3300 ... 169	6600 ... 333	15800 ... 778
Maximum flow rate	130% of nominal flow rate					
Minimum flow rate	Depending on measuring error required					

Definition of OIML R 117 accuracy classes

Class 0.3	Measuring systems on pipelines, sometimes called the pipeline transfer standard, which is required for applications where flows are for long periods of time, e.g. oil transfer between storage tanks or long distance pumping transfer
Class 0.5	All other measuring systems (if not explicitly stated in another class), e.g. loading / unloading of ships, railcars and road tankers

Accuracy

Accuracy, liquid (all sizes)	±0.1% of actual measured flow rate
Repeatability	Better than 0.05% plus zero stability (includes the combined effects of repeatability, linearity and hysteresis)
Zero stability	±0.008% of nominal flow rate for the sensor size

Reference conditions

Product	Water
Temperature	20°C / 68°F
Operating pressure	1 barg/ 14.5 psig

Density

Measuring range	500...2000 kg/m ³ / 30...125 lbs/ft ³
Accuracy	±2 kg/m ³ / ±0.13 lbs/ft ³
Accuracy (on-site calibration)	±0.5 kg/m ³ / ±0.033 lbs/ft ³

Temperature

Measuring range	-40...+150°C / -40...+302°F
Accuracy	±1°C / ±1.8°F

Materials

Measuring tube	Titanium
Flange raised face	Titanium
Flanges	Stainless steel 1.4435 / AISI 316L
Outer cylinder (secondary pressure containment)	Stainless steel 1.4301 / AISI 304 (optional: stainless steel 1.4435 / AISI 316L)
Sensor electronics housing	Stainless steel 1.4435 / AISI 316L

Nominal pressure at 20°C or 68°F

Measuring tube	-1...63 barg / -14.5...910 psig
Outer cylinder (secondary pressure containment)	Standard: -1...63 bar / -14.5...910 psig
	Optional: -1...100 barg. / -14.5...1450 psig

Temperature

Process temperature - flanged connections	-40...+150°C / -40...+302°F
Ambient temperature - compact version	-40...+55°C / -40...+130°F
Ambient temperature - remote version	-40...+60°C / -40...+140°F

Process effects on the sensor

Temperature	0.002% of nominal flow rate per 1°C / 0.001% of nominal flow rate per 1°F
Pressure	0.015% of nominal flow rate per 1 barrel. / 0.001% of nominal flow rate per 1 psig

Approvals

Mechanical

Protection category (acc. to EN 60529)	IP 67; NEMA 4X
European Pressure Equipment directive	PED 97-23 EC (acc. to AD 2000 Regelwerk)

Hazardous area classifications

	Sensor only	Converter only	Compact unit
ATEX (acc. to 94/9/EC)	II 2 G EEx ib IIC T6	II 2 G EEx de [ib] IIC T6 (with "increased safety" terminal housing II 2 G EEx d [ib] IIC T6 (with "flameproof" terminal housing)	II 2 G EEx de [ib] IIC T6 (with "increased safety" terminal housing II 2 G EEx d [ib] IIC T6 (with "flameproof" terminal housing)
Factory Mutual / CSA	Class I, Div 1 groups A, B, C, D		
	Class II, Div 1 groups E,F,G		
	Class III, Div 1 hazardous areas		
	Class I, Div 2 groups A, B, C, D		
	Class II, Div 2 groups F,G		
Custody transfer PTB	Class III, Div 2 hazardous areas		
	PTB 5.4.11 04.16 (massflow only)		

Please contact KROHNE for list of other country approvals

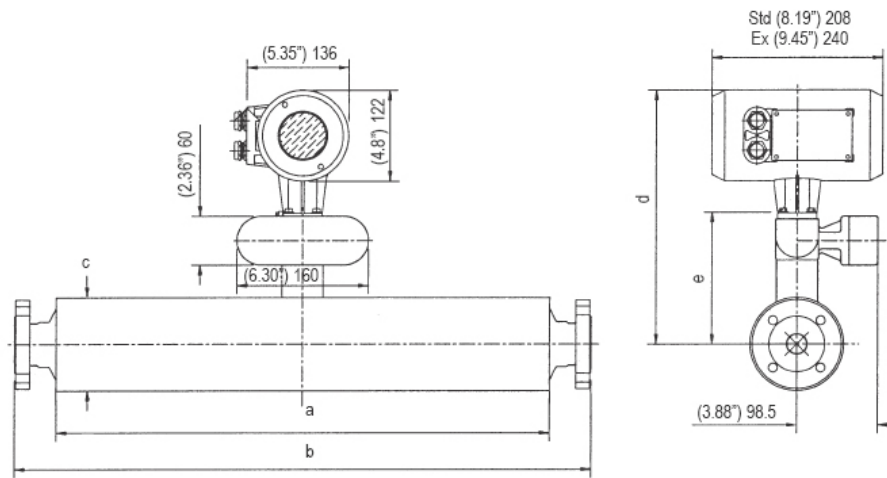
Electromagnetic compatibility (EMC)

to CE	EN 50081-1 (1992); EN 50082-2 (1994); Namur NE 21/5.95; 89/336/EEC (EMC); 72/73/EEC (Low Voltage Directive)
-------	--

Calibration

On flow rigs	accredited by UKAS according to BS/EN/ISO/IEC 17025
--------------	---

Dimensions and weights



	Metric units (mm / kg)					US units (inches / lbs)				
	T15	T25	T40	T50	T80	T15	T25	T40	T50	T80
Length of measuring tube	450	598	796	948	1274	17.12"	23.54"	31.34"	37.32"	50.16"
Insertion length with flange										
DIN	548±2	700±2	925±2	1101±2	1460±4	21.57±0.08	27.56±0.08	36.42±0.08	43.35±0.08	57.48±0.16
DIN tongue and groove	556±2	708±2	933±2	1109±2	1468±4	21.89±0.08	27.87±0.08	36.73±0.08	43.66±0.08	57.80±0.16
JIS	548±2	700±2	925±2	1101±2	1460±4	21.57±0.08	27.56±0.08	36.42±0.08	43.35±0.08	57.48±0.16
ANSI 150 lb	548±2	700±2	925±2	1101±2	1460±4	21.57±0.08	27.56±0.08	36.42±0.08	43.35±0.08	57.48±0.16
ANSI 300 lb	548±2	700±2	925±2	1101±2	1460±4	21.57±0.08	27.56±0.08	36.42±0.08	43.35±0.08	57.48±0.16
ANSI 600 lb	556±2	708±2	933±2	1109±2	1468±4	21.89±0.08	27.87±0.08	36.73±0.08	43.66±0.08	57.80±0.16
Measuring tube outer diameter	102	115	169	219	273	4.02	4.53	6.65	8.62	10.75
Total height from mid tube to converter top	312	319	346	371	398	12.28	12.56	13.62	14.61	15.67
Height mid tube to front-end outlet	160	166	193	219	246	6.30	6.54	7.60	8.62	9.69
Measuring tube inner diameter	15	24	37	49	69	0.59	0.94	1.46	1.93	2.72
Weight	23	35	80	145	260	50.6	77	176	319	572