



Turbine Flow Meter

QuikSert® Explosion-Proof

DESCRIPTION

The QuikSert in-line turbine flow meter was developed for liquid applications where accuracy and dependability are needed. QuikSert's stainless steel body incorporates a helical turbine with tungsten carbide shaft and bearing. It provides an efficient, long service life and a cost-effective solution for your measurement requirements.

Simple in design and construction, QuikSert uses modified upstream and downstream flow straighteners for a high degree of flow accuracy. Its between-the-flange design eliminates the need for mating flanges, requiring less space in the flow line, lowering costs for easy, one-man installation.

The meter produces a sine-wave signal proportional to its volumetric flow rate. With optional Pembina Controls electronics, QuikSert provides local flow rate and volume totalization and interfaces with most instruments, PLCs and computers.

FEATURES

- Accurate and repeatable flow measurement from 0.6...3 gpm (20...100 bpd) to 500...5000 gpm (17,000...171,000 bpd).
- Unique between-the-flange design eliminates need for mating flanges.
- Superior materials of construction for high performance in aggressive environments.
- Wafer-style mounting configurations for limited space requirements.
- Modified flow straighteners for enhanced fluid dynamics.
- Available as Non-Calibrated (NCC). NCC models have standard K-factors



INSTALLATION

The QuikSert turbine meter is simple to install and service. The meter should be installed with the "flow direction" arrow aligned with the direction of the line flow. For optimum performance, the flow meter should be installed with a minimum of 10 diameters upstream straight pipe length and 5 diameters downstream straight pipe length.

REPAIR KITS

Factory calibrated repair kits are available for field service. A repair kit contains six screws, two rotor supports, one rotor assembly, and a K-factor tag. The rotor support assembly is retained in proper position within the meter body by the support screws. These screws allow for quick and easy disassembly and replacement of the meter's internal components. QuikSert repair kits are designed and manufactured for use with Pembina Controls turbines and other flow meters of similar design; contact the factory for further details.

OPERATING PRINCIPLE

Fluid entering the meter first passes through an inlet flow straightener that reduces its turbulent flow pattern. Fluid then passes through the turbine, causing the turbine to rotate at a speed proportional to fluid velocity. As each turbine blade passes through the magnetic field generated by the meter's magnetic pickup, an AC voltage pulse is generated. These pulses provide an output frequency that is proportional to volumetric flow.

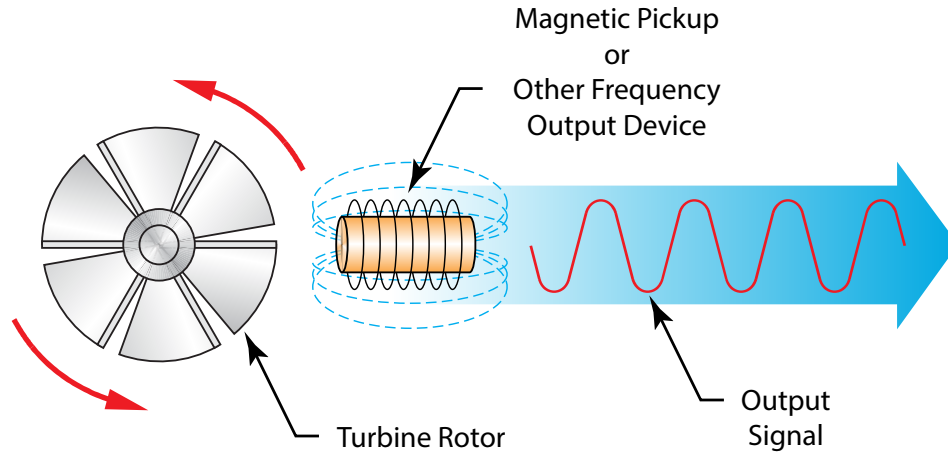


Figure 1: Schematic illustration of electric signal generated by rotor movement

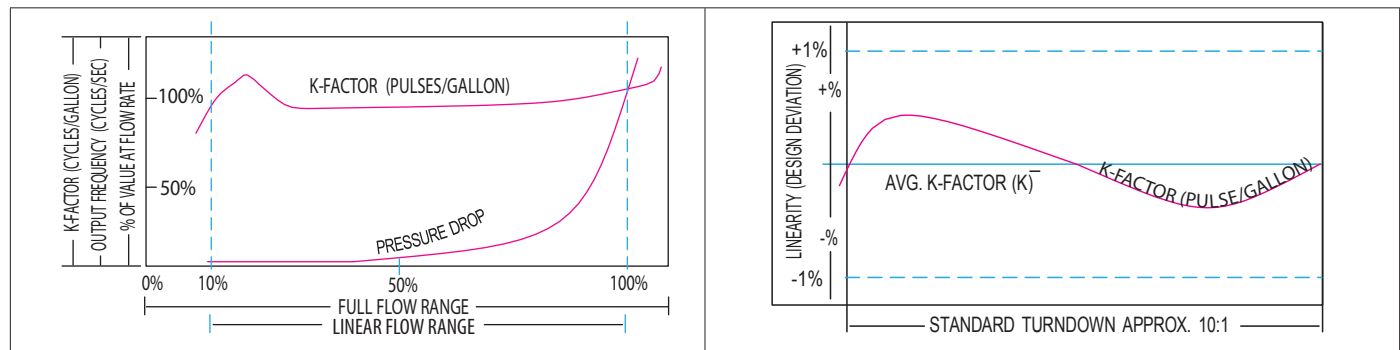
K-FACTOR

The K-factor represents the number of output pulses transmitted per gallon of fluid passing through the turbine meter. Each turbine has a unique K-factor. However, turbine meters are not functionally consistent throughout the full flow range of the meter.

There are several forms of friction inherent in turbine meters that slow down the rotational movement of the turbine rotor. These frictional forces include: magnetic drag, created by electromagnetic force of pickup transducers; mechanical drag, due to bearing friction; and viscous drag, produced by flowing fluid. See charts below.

As flow increases, the frictional forces are minimized and the free-wheeling motion of the turbine rotor becomes more linear (proportional to flow). The K-factor becomes relatively constant and linear throughout the balance of the linear flow range. This is approximately a 10:1 turndown ratio from the maximum flow rate down to the minimum flow rate.

Typical K-factor Curve (Pulse per US Gallon)



SPECIFICATIONS

Materials of Construction	Body	316/316L stainless steel
	Rotor	CD4MCu stainless steel
	Bearings	Tungsten carbide
	Rotor Shaft	Tungsten carbide
	Rotor Support	316L
Operating Temperature	–150...350° F (–101...177° C) standard Temperatures to 450° F (232° C) with high-temp pickup, consult factory for details The standard meter should not be subjected to temperatures above 350° F (177° C), or below –150° F (–101° C) or the freezing point of the metered liquid.	
Pressure Rating	See "Pressure Rating" below	
End Connections	Wafer-Style ASME/ANSI B16.5-1996	
Turndown Ratio	—	
Accuracy	± 1.0% of reading for 7/8 in. and larger meters. ± 1.0% of reading over the upper 70% of the measuring range for 3/8, 1/2, and 3/4 in. meters	
Repeatability	± 0.1%	
Calibration	Water; NIST Traceable Calibration, Certificate available, consult factory for details	
Pickup	BP111109, BP220111, BP220210, B220243, B111126	
Conformance	NACE MR0175/ISO 15156	
Pressure Standards/Approvals	Canadian Registration Number (CRN), PED 2014/68/EU, Group 1, Category II	
Pulsation and Vibration	Severe pulsation and mechanical vibration will affect accuracy and shorten the life of the meter.	
Certifications	Class I Div. I Groups C,D Complies to UL1203 and CSA 22.2 No. 30 Met Labs File No. E112860	

Pressure Rating

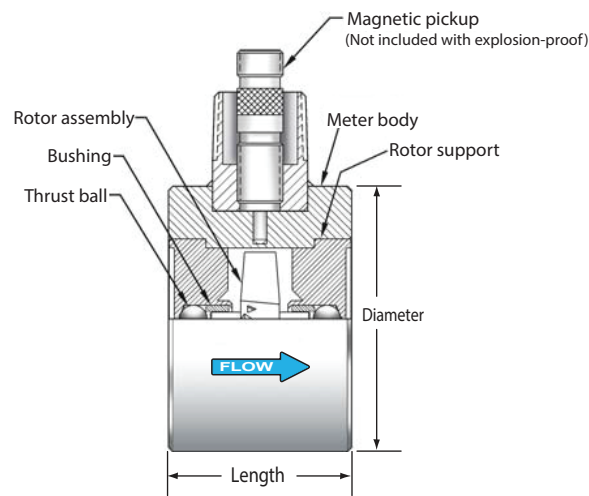
The pressure rating of the meter is dependent upon the class of ANSI flanges between which the meter is to be mounted. The pressure rating chart below is based on Carbon Steel at 100° F (37.8° C).

Flange Class (ANSI)	150#	300#	600#	900#	1500#
Working Pressure (psi)	285	740	1480	2220	3705
Working Pressure (bar)	20	51	102	153	256
Working Pressure (MPa)	1.97	5.10	10.20	15.31	25.55
¹Test Pressure (psi)	427.5	1110	2220	3330	5557.5
¹Test Pressure (MPa)	2.95	7.65	15.31	22.98	38.32

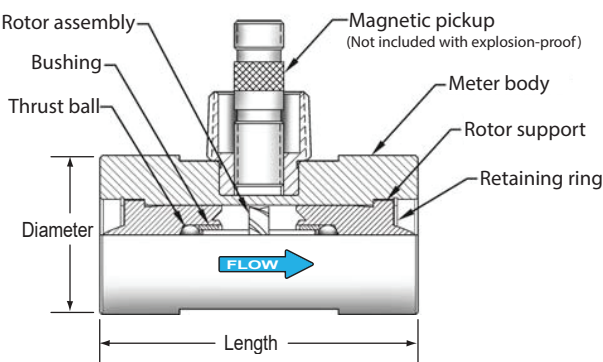
¹Test pressure based on 1.5 safety factor

DIAGRAMS

Models BP132C-050...BP139C-900



Models BP131C-038...BP131C-100



PART NUMBER INFORMATION (PICK-UP NOT INCLUDED)

Part Number*	Meter Bore Size × Line Size (in.)	PED Compliant	Flow Range	Strainer Mesh	Approx. K-Factor pulses/US gal	Weight	Max. Pressure Drop (psi)
BP131C-038	3/8 × 1	Coming soon	See "Flow Range Chart" below	60	18,000	—	3.75
BP131C-050	1/2 × 1	Coming soon		60	13,000	—	6.5
BP131C-075	3/4 × 1	Coming soon		60	3300	—	18
BP131C-088	7/8 × 1	Coming soon		60	3100	—	20
BP131C-100	1 × 1	Coming soon		60	870	—	20
BP132C-050	1/2 × 2	Coming soon		60	13,000	—	12
BP132C-075	3/4 × 2	Coming soon		60	3300	—	18
BP132C-088	7/8 × 2	Coming soon		60	3100	—	20
BP132C-100	1 × 2	Coming soon		40	870	—	20
BP132C-150	1-1/2 × 2	Coming soon		20	330	—	16
BP132C-200	2 × 2	Yes		20	52	—	9
BP132C-250	2 × 3	Yes		10	52	—	10
BP133C-300	3 × 3	Yes		10	57	—	10
BP133C-380	3 × 3	Yes		10	57	—	10
BP134C-400	4 × 4	Yes		10	29	—	10
BP136C-600	6 × 6	Coming soon		4	7	—	10
BP138C-800	8 × 8	Coming soon		4	3	—	10
BP139C-900	10 × 10	Coming soon		4	1.6	—	10

Flow Range Chart

Part Number	Flow Ranges		
	gpm (lpm)	bpd	m ³ /d
BP131C-038	0.60...3.00 (2.27...11.36)	20...100	3.3...16
BP131C-050	0.75...7.50 (2.84...28.39)	25...250	4.1...41
BP131C-075	2.00...15.00 (7.57...56.78)	68...515	10.9...81.75
BP131C-088	3.00...30.00 (11.36...113.56)	100...1000	16...160
BP131C-100	5.00...50.00 (18.93...189.27)	170...1700	27.25...272.5
BP132C-050	0.75...7.50 (2.84...28.39)	25...250	4.1...41
BP132C-075	2.00...15.00 (7.57...56.78)	68...515	10.9...81.75
BP132C-088	3.00...30.00 (11.36...113.56)	100...1000	16...160
BP132C-100	5.00...50.00 (18.93...189.27)	170...1700	27.25...272.5
BP132C-150	15.00...180.00 (56.78...681.37)	515...6000	82...981
BP132C-200	40.00...400.00 (151.42...1514.16)	1300...13,000	218...2180
BP132C-250	40.00...400.00 (151.42...1514.16)	1300...13,000	218...2180
BP133C-300	60.00...600.00 (227.12...2271.25)	2100...21,000	327...3270
BP133C-380	80.00...800.00 (302...3028)	2750...27,500	430...4300
BP134C-400	100.00...1200.00 (378.54...4542.49)	3400...41,000	545...6540
BP136C-600	200.00...2500.00 (757.08...9463.53)	6800...86,000	1,090...13,626
BP138C-800	350.00...3500.00 (1324.89...13248.94)	12,000...120,000	1,363...19,076
BP139C-900	500.00...5000.00 (1892.71...18927.06)	17,000...171,000	2,725...27,252

NOTE: All models available as NCC (no calibration.) NCC models are without NIST certified calibration. Nominal K-factor provided.

NCC models cannot be provided with a calibration report. If turbine calibration reports are required, the factory calibrated model must be ordered.

To order NCC, add 'NCC' at the end of the part number. Example: BP131C-038-NCC

DIMENSIONS TABLE


Part Number	Diameter	Length
BP131C-038 BP131C-050 BP131C-075 BP131C-088 BP131C-100	2 in.	4 in.
BP132C-050 BP132C-075 BP132C-088 BP132C-100 BP132C-150 BP132C-200	3.62 in.	2.5 in.
BP132C-250 BP133C-300 BP133C-380	5 in.	4.25 in.
BP134C-400	6.18 in.	5 in.
BP136C-600	8.5 in.	5.75 in.
BP138C-800	10.62 in.	6.25 in.
BP139C-900	12.75 in.	6.75 in.

INSTALLATION KITS

QuikSert Installation Kits are offered to make set up trouble-free and to ensure the proper fit. Each kit includes: studs, nuts, gaskets, and spacer rings. See table below for ordering information.

Size	150#	300#	600#	900#	1500#
1 in. (25.4 mm)	007-01-150	007-01-300	007-01-600	007-01-900	007-01-1500
2 in. (50.8 mm)	007-02-150	007-02-300	007-02-600	007-02-900	007-02-1500
3 in. (76.2 mm)	007-03-150	007-03-300	007-03-600	007-03-900	007-03-1500
4 in. (101.6)	007-04-150	007-04-300	007-04-600	007-04-900	007-04-1500
6 in. (152.4 mm)	007-06-150	007-06-300	007-06-600	007-06-900	007-06-1500
8 in. (203.2 mm)	007-08-150	007-08-300	007-08-600	007-08-900	007-08-1500
10 in. (254.0 mm)	007-10-150	007-10-300	007-10-600	007-10-900	007-10-1500

PICKUP OPTIONS

Part Number	Magnetic Pickup	Temperature Range
BP111109	Standard	-150...330° F (-101...165° C)
BP220111	High temperature	-450...450° F (-26...232° C)
BP220210	With preamplifier	-40...250° F (-40...121° C)
B220243	Intrinsically safe, FM rated	-40...250° F (-40...21° C)
B111126	ATEX  II 1G; EEx ia IIC T5	-58...248° F (-50...120° C)

REPAIR KITS

Part Number	Repair Kit Part Number
BP131-038	BP251-102
BP131-050	BP251-105
BP131-075	BP251-108
BP131-088	BP251-109
BP131-100	BP251-112
BP132-050	BP253-205
BP132-075	BP253-208
BP132-088	BP253-209
BP132-100	BP253-212
BP132-150	BP253-216
BP132-200	BP253-220
BP132-250	BP253-220
BP133-300	BP253-330
BP133-380	BP253-330
BP134-400	BP253-440
BP136-600	BP253-660
BP138-800	BP253-880
BP139-900	BP253-990

NOTE: For NCC (no calibration) repair kits, add NCC at the end of the part number. Example: BP251-102-NCC.

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