

## Turbine Flow Meter

QuikSert® Explosion-Proof

### DESCRIPTION

The QuikSert Explosion-Proof 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. QuikSert Explosion proof turbines have a welded pickup hub to eliminate any potential leak path for gases, reducing chances of explosion. These characteristics provide 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.
- Welded pickup hub
- 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.

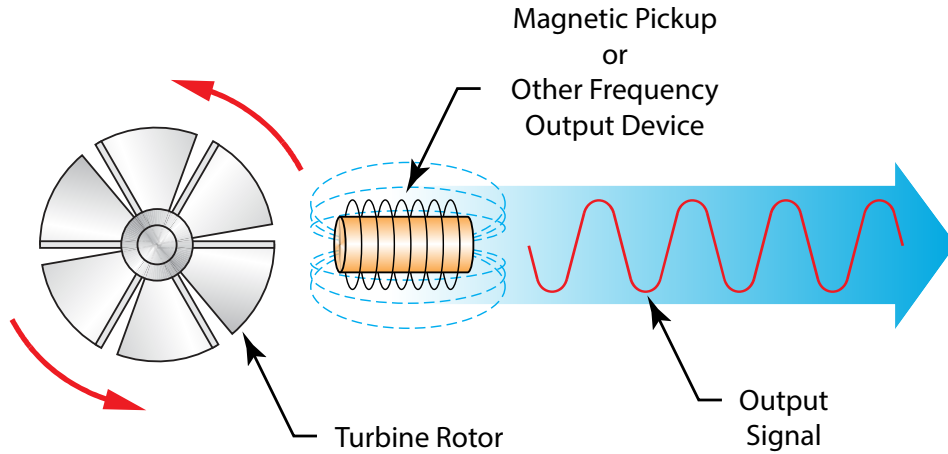


Figure 1: Schematic illustration of electric signal generated by rotor movement

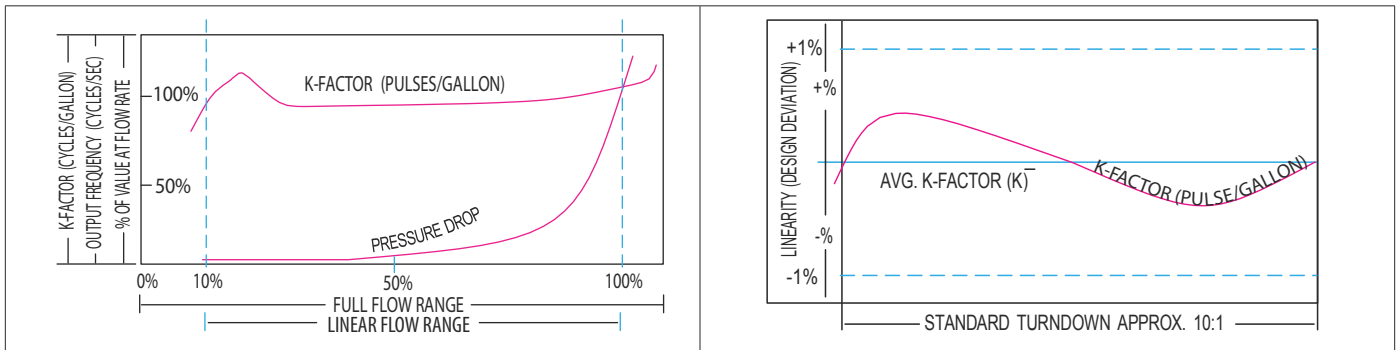
## K-FACTOR

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

<b>Materials of Construction</b>	<b>Body</b>	316/316L stainless steel
	<b>Rotor</b>	CD4MCu stainless steel
	<b>Bearings</b>	Tungsten carbide
	<b>Rotor Shaft</b>	Tungsten carbide
	<b>Rotor Support</b>	316L
<b>Operating Temperature</b>	–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.	
<b>Pressure Rating</b>	See " <b>Pressure Rating</b> " below	
<b>End Connections</b>	Wafer-Style ASME/ANSI B16.5-1996	
<b>Turndown Ratio</b>	—	
<b>Accuracy</b>	± 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	
<b>Repeatability</b>	± 0.1%	
<b>Calibration</b>	Water; NIST Traceable Calibration, Certificate available, consult factory for details	
<b>Pickup</b>	BP111109, BP220111, BP220210, B220243, B111126	
<b>Conformance</b>	NACE MR0175/ISO 15156	
<b>Pressure Standards/Approvals</b>	Canadian Registration Number (CRN), PED 2014/68/EU, Group 1, Category II	
<b>Pulsation and Vibration</b>	Severe pulsation and mechanical vibration will affect accuracy and shorten the life of the meter.	
<b>Certifications</b>	Class I Div. I Groups C,D Complies to UL1203 and CSA 22.2 No. 30 Met Labs File No. E112860	

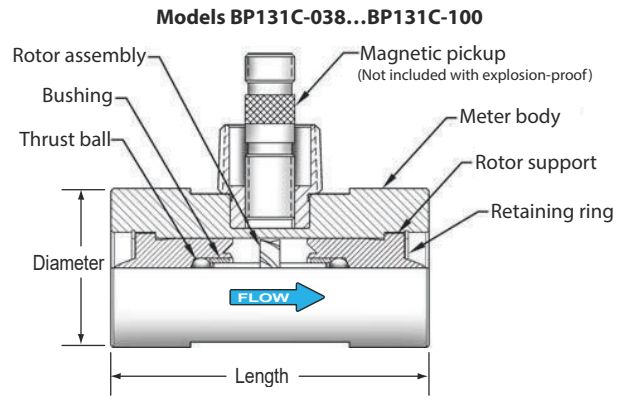
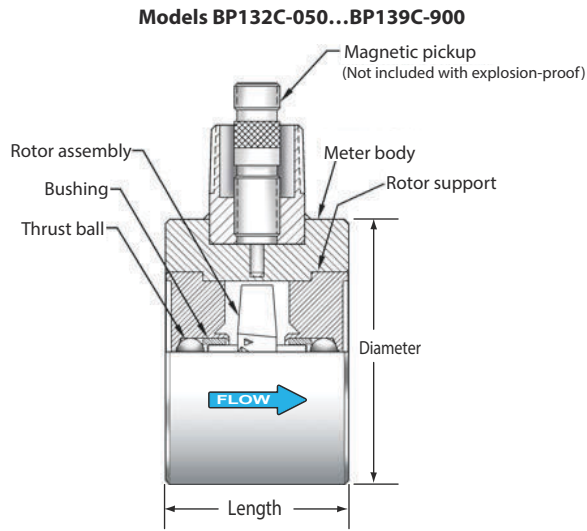
### Pressure Rating

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#
<b>Working Pressure (psi)</b>	285	740	1480	2220	3705
<b>Working Pressure (bar)</b>	20	51	102	153	256
<b>Working Pressure (MPa)</b>	1.97	5.10	10.20	15.31	25.55
<b><sup>1</sup>Test Pressure (psi)</b>	427.5	1110	2220	3330	5557.5
<b><sup>1</sup>Test Pressure (MPa)</b>	2.95	7.65	15.31	22.98	38.32

<sup>1</sup>Test pressure based on 1.5 safety factor

**DIAGRAMS**



**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 <sup>3</sup> /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)

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**REPAIR KITS**

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