



Turbine Flow Meter

B16N Series FloClean Tri-Clamp End Fitting

DESCRIPTION

The B16N Series FloClean Tri-Clamp turbine flow meter was developed for pre-process food and beverage applications that require high accuracy without 3-A approval. The 316L stainless steel construction provides a durable and cost efficient flow measurement system that offers excellent accuracy and repeatability.

FloClean B16N Series meters have removable thrust bearings for ease of cleaning and inspection.

The FloClean output signal is a sine-wave that is proportional to volumetric flow. With optional Blancett electronics, FloClean provides local flow rate and volume totalization and interfaces with most displays, PLCs and computers.

INSTALLATION

Install the flow meter with the flow arrow, which is etched on the exterior of the meter body, pointing in the direction of fluid flow. Install the meter horizontally with the magnetic pickup facing upward. 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 replacement kits are available for field or factory service. Both of the FloClean models are designed to allow for quick, easy disassembly and replacement of internal components. The repair kit contains two retaining rings, two rotor supports, one rotor assembly and a K-factor tag.

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.

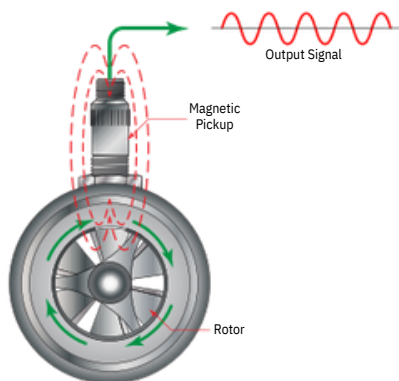


Figure 1: B142 turbine flow meter



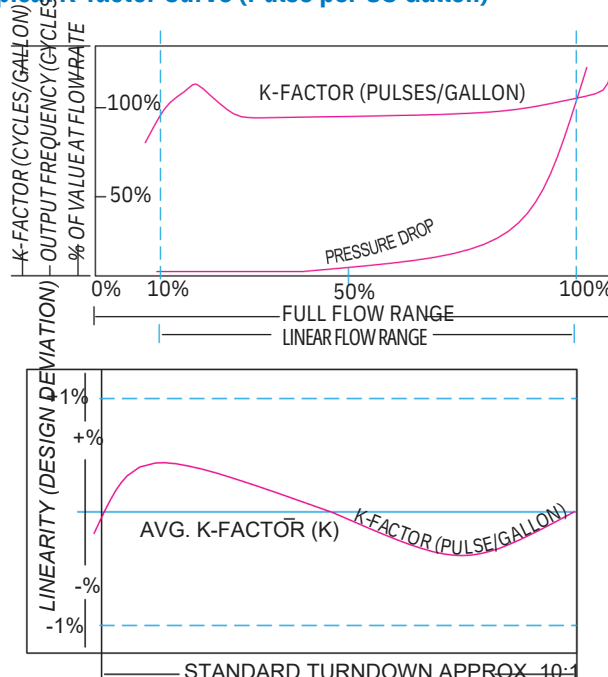
K-FACTOR

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)

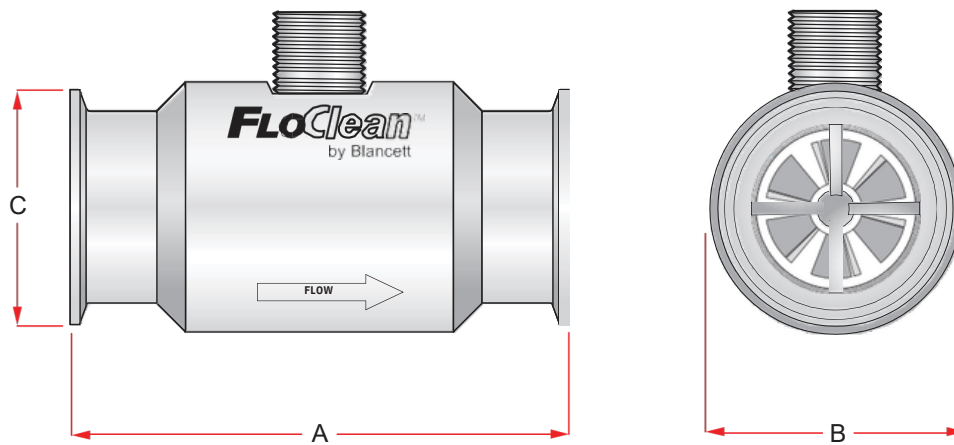




SPECIFICATIONS

Materials of Construction	Body	316L stainless steel
	Rotor	Nickel plated CD4MCU stainless steel
	Bearings	Standard-nickle bindery tungsten carbide
	Rotor Shaft	Nickel bindery tungsten carbide
	Rotor Support	—
Operating Temperature —150...300° F (–100...149° C)		
Pressure Rating 1,000 psi (Rating based on tri-clamp sanitary connection)		
End Connections Tri-clamp end fittings		
Turndown Ratio —		
Accuracy ±1.0% of reading		
Repeatability ±0.1%		
Calibration Water (NIST traceable calibration)		
Mag Pickup NEMA 6; –150...300° F (–100...149° C)		
Certifications —		

DIMENSIONS



Part Number	Part Number Code	A End to End Length	B Diameter	C Ferrule Size
B16N-0XXA-XXX	003 005 007	3.00 in. (76.2 mm)	1.46 in. (37.1 mm)	0.984 in. (25.0 mm)
B16N-1XXA-XXX	105 107 108 110	4.00 in. (101.6 mm)	2.00 in. (50.8 mm)	1.984 in. (50.4 mm)
B16N-1XXA-XXX ¹	115 1	6.25 in. (158.8 mm)	2.33 in. (59.2 mm)	1.984 in. (50.4 mm)
B16N-2XXA-XXX	220	6.50 in. (165.1 mm)	3.20 in. (81.3 mm)	3.047 in. (77.4 mm)

¹ 15.0...180.0 gpm flow range only.



PART NUMBER INFORMATION

Approx.

Part No. Code	Bore Size in. (mm)	End Connections	Max PSI	Flow Rate			Factor Pulse/Weight US Gal	Meter End to End Length Lein. (mm)	Ferrule Size in. (mm)
				gpm (lpm)	bpd	m3/d			
003	3/8 (9.53)	0.984 in. (24.99 mm)	1000	0.60...3.00 (2.27...11.36)	20.57...102.86	3.27...16.35	20,000	—	0.984 (24.99)
005	1/2 (12.70)	0.984 in. (24.99 mm)	1000	0.75...7.50 (2.84...28.39)	21.71...257.14	4.09...40.88	13,000	—	0.984 (24.99)
007	3/4 (19.05)	0.984 in. (24.99 mm)	1000	2.00...15.00 (7.57...56.78)	68.57...514.29	10.90...81.76	2750	—	0.984 (24.99)
105	1/2 (12.70)	1.984 in. (50.39 mm)	1000	0.75...7.50 (2.84...28.39)	21.71...257.14	4.09...40.88	13,000	—	1.984 (50.39)
107	3/4 (19.05)	1.984 in. (50.39 mm)	1000	2.00...15.00 (7.57...56.78)	68.57...514.29	10.90...81.76	2750	—	1.984 (50.39)
108	7/8 (22.23)	1.984 in. (50.39 mm)	1000	3.00...30.00 (11.36...113.56)	102.86...1028.57	16.35...163.53	2686	—	1.984 (50.39)
110	1 (25.40)	1.984 in. (50.39 mm)	1000	5.00...50.00 (18.93...189.27)	171.43...1714.29	27.25...272.55	870	—	1.984 (50.39)
115	1-1/2 (38.10)	1.984 in. (50.39 mm)	1000	15.00...180.00 (56.78...681.37)	514.29...6171.43	81.76...981.18	330	—	1.984 (50.39)
220	2 (50.80)	3.047 in. (77.39 mm)	1000	40.00...400.00 (151.42...1514.16)	1371.43...13714.29	218.04...2180.40	52	—	3.047 (77.39)

Repair Kits

Bore Size	Ferrule Size	Repair Kit Fits Meter Part Number	Part Number Code	Repair Kit Part Number
3/8 in. (9.53 mm)	0.984 in. (24.99 mm)	B16N-003A-	00	B16C-K03A
1/2 in. (12.70 mm)	0.984 in. (24.99 mm)	XXX B16N-	3	B16C-K05A
3/4 in. (19.05 mm)	0.984 in. (24.99 mm)	005A-XXX	00	B16C-K07A
1/2 in. (12.70 mm)	1.984 in. (50.39 mm)	B16N-007A-	5	B16C-K05A
3/4 in. (19.05 mm)	1.984 in. (50.39 mm)	XXX B16N-	00	B16C-K07A
7/8 in. (22.23 mm)	1.984 in. (50.39 mm)	105A-XXX	7	B16C-K08A
1 in. (25.40 mm)	1.984 in. (50.39 mm)	B16N-107A-	10	B16C-K10A
1-1/2 in. (38.10 mm)	1.984 in. (50.39 mm)	XXX B16N-	5	B16C-K15A
2 in. (50.80 mm)	3.047 in. (77.39 mm)	108A-XXX	10	B16C-K20A
		B16N-110A-	7	
		XXX B16N-	10	
		115A-XXX	8	
		B16N-220A-	11	
		XXX	0	
			11	
			5	
			22	
			0	



PART NUMBERING CONSTRUCTION

FloClean

Tri-clover End Fitting

B16N - A -

FERRULE & METER SIZE

Ferrule: 0.984 in. 3/4 in. Clamp x 3/8 in. Bore	00
Ferrule: 0.984 in. 3/4 in. Clamp x 1/2 in. Bore	3
Ferrule: 0.984 in. 3/4 in. Clamp x 3/4 in. Bore	00
Ferrule: 1.984 in. 1-1/2 in. Clamp x 1/2 in. Bore	5
Ferrule: 1.984 in. 1-1/2 in. Clamp x 3/4 in. Bore	00
Ferrule: 1.984 in. 1-1/2 in. Clamp x 7/8 in. Bore	7
Ferrule: 1.984 in. 1-1/2 in. Clamp x 1 in. Bore	10
Ferrule: 1.984 in. 1-1/2 in. Clamp x 1-1/2 in. Bore	5
Bore Ferrule: 3.047 in. 2-1/2 in. Clamp x 2 in.	10

BEARING

NickelBinery; Tungsten Carbide	10	A
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PICKUP

Magnetic NEMA 6	11	0
Magnetic with Pre-Amplifier NEMA 6	0	1
¹ Magnetic Standard	11	2
¹ Magnetic with Pre-Amplifier Standard	5	3
¹ Magnetic with F/I Converter (Active 4...20 mA Output)	22	4
¹ Magnetic High Temperature (-450...450° F/-268...232° C)	0	6
Magnetic with Pre-Amplifier NEMA 6 (Less Zenor)		7
Magnetic with F/V Converter (Active 0...5V DC Output)		8
NoPickup		9

METER BODY HUB

WithHub 1/2in. Hub for Ferrule Size 0.984; 1 in. Hub for 1.984 in. and 3.047 in	A
No Hub	B

CALIBRATION

5-Point		A
Standard	10-	B
Point		C

¹ For 20-Point Use Only

Example Part Number: B16N-110A-2AA



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