



Blancett[®]
Turbine Flow Meters

Turbine Flow Meter

B16D Series FloClean Sanitary

DESCRIPTION

The FloClean Sanitary turbine flow meter was developed for use in the food, beverage and pharmaceutical industries. The 316L stainless steel construction provides a durable and cost efficient flow measurement system that offers excellent accuracy and repeatability.

The FloClean uses the most up-to-date polishing technology on all internal components and all materials comply with FDA requirements. FloClean B16D Series meters have removable thrust bearings for ease of cleaning and inspection, and meet the requirements of 3-A Sanitary Standard number 28-04 for use in clean-out-of-place (COP) and sanitize-out-of-place (SOP) applications and carry the 3-A Sanitary symbol.

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.



Badger Meter

TRB-DS-02185-EN-03 (September 2018)

Product Data Sheet

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.

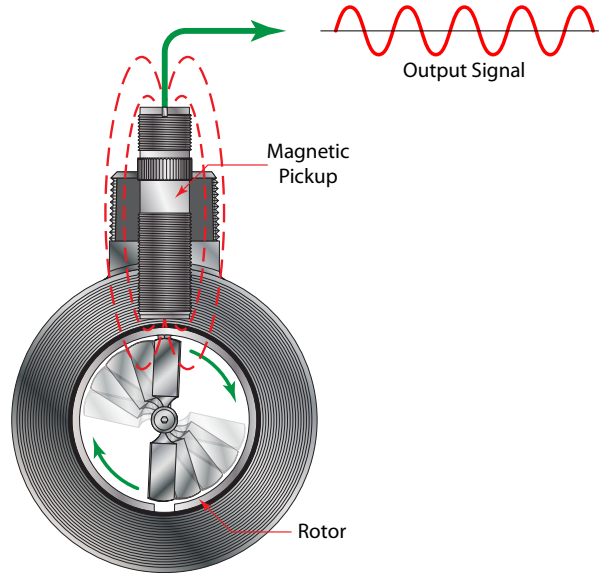


Figure 1: B142 turbine flow meter

K-FACTOR

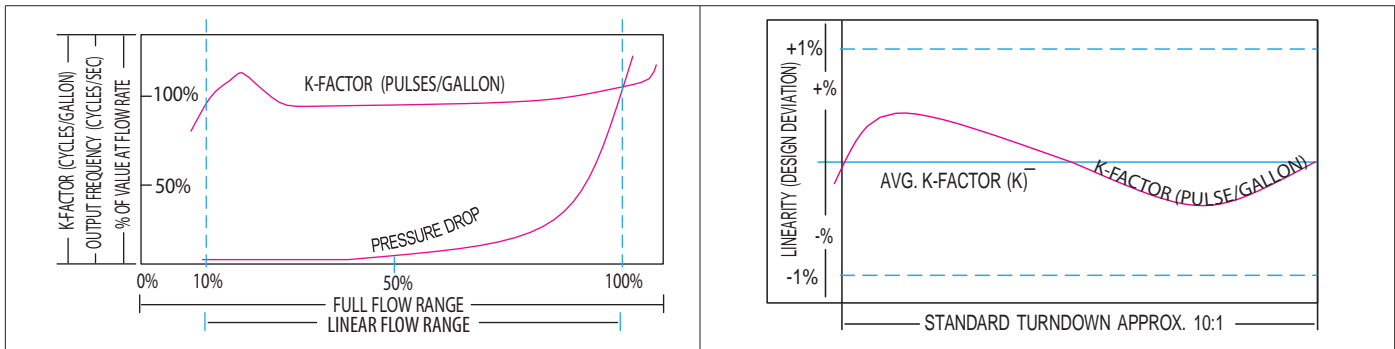
The K-factor represents the number of output pulses transmitted per gallon of fluid passing through the turbine meter. Each turbine has a unique K-factor. However, turbine meters are not functionally consistent throughout the full flow range of the meter.

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.

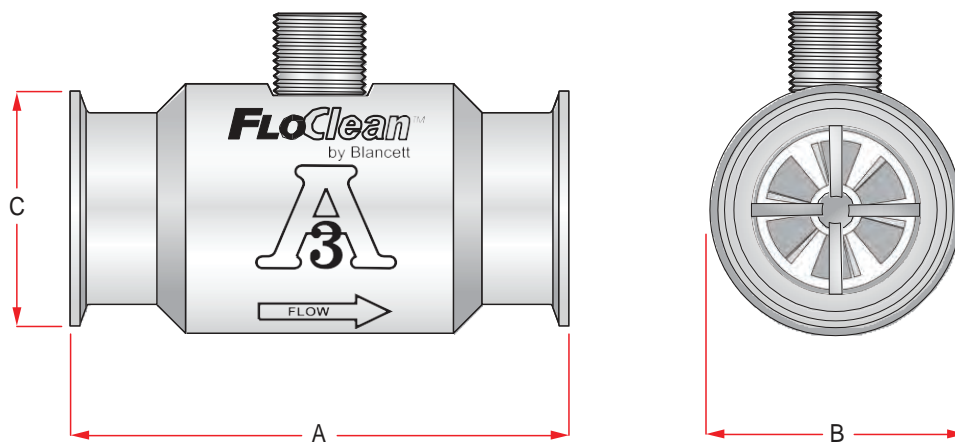
Typical K-factor Curve (Pulse per US Gallon)



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	Sanitary clamp end	
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 No.	Part Number Code	A End to End	B Diameter	C Ferrule Size
B16D-0XXA-XXX	003	3.00 in. (76.2 mm)	1.46 in. (37.1 mm)	0.984 in. (25.0 mm)
	005			
	007			
B16D-1XXA-XXX	105	4.00 in. (101.6 mm)	2.00 in. (50.8 mm)	1.984 in. (50.4 mm)
	107			
	108			
	110			
B16D-1XXA-XXX ¹	115 ¹	6.25 in. (158.8 mm)	2.33 in. (59.2 mm)	1.984 in. (50.4 mm)
B16D-2XXA-XXX	220	6.50 in. (165.1 mm)	3.20 in. (81.3 mm)	3.047 in. (77.4 mm)

PART NUMBER INFORMATION

Part Number Code	Bore Size	End Connections	Max PSI	Flow Rate			Strainer Mesh	Approx. K-Factor Pulse/US Gal	Meter Weight (lb)	Ferrule Size in. (mm)	End to End Length in. (mm)
				gpm (lpm)	bpd	m ³ /d					
003	3/8 in. (9.53 mm)	0.984 in. (25.0 mm)	1000	0.60...3.00 (2.27...11.36)	20.57...102.86	3.27...16.35	—	20,000	—	0.984 (24.99)	3.00 (76.2)
005	1/2 in. (12.7 mm)	0.984 in. (25.0 mm)	1000	0.75...7.50 (2.84...28.39)	21.71...257.14	4.09...40.88	—	13,000	—	0.984 (24.99)	3.00 (76.2)
007	3/4 in. (19.05 mm)	0.984 in. (25.0 mm)	1000	2.00...15.00 (7.57...56.78)	68.57...514.29	10.90...81.76	—	2750	—	0.984 (24.99)	3.00 (76.2)
105	1/2 in. (12.7 mm)	1.984 in. (50.4 mm)	1000	0.75...7.50 (2.84...28.39)	21.71...257.14	4.09...40.88	—	13,000	—	1.984 (50.39)	4.00 (101.60)
107	3/4 in. (19.05 mm)	1.984 in. (50.4 mm)	1000	2.00...15.00 (7.57...56.78)	68.57...514.29	10.90...81.76	—	2750	—	1.984 (50.39)	4.00 (101.60)
108	7/8 in. (22.23 mm)	1.984 in. (50.4 mm)	1000	3.00...30.00 (11.36...113.56)	102.86...1028.57	16.35...163.53	—	2686	—	1.984 (50.39)	4.00 (101.60)
110	1 in. (25.4 mm)	1.984 in. (50.4 mm)	1000	5.00...50.00 (18.93...189.27)	171.43...1714.29	27.25...272.55	—	870	—	1.984 (50.39)	4.00 (101.60)
115	1-1/2 in. (38.1 mm)	1.984 in. (50.4 mm)	1000	15.00...180.00 (56.78...681.37)	514.29...6171.43	81.76...981.18	—	330	—	1.984 (50.39)	6.25 (158.8)
220	2 in. (50.8 mm)	3.047 in. (77.4 mm)	1000	40.00...400.00 (151.42...1514.16)	1371.43...13714.29	218.04...2180.40	—	52	—	3.047 (77.39)	6.50 (165.1)

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)	B16D-003A-XXX	003	B16D-K03A
1/2 in. (12.7 mm)	0.984 in. (24.99 mm)	B16D-005A-XXX	005	B16D-K05A
3/4 in. (19.05 mm)	0.984 in. (24.99 mm)	B16D-007A-XXX	007	B16D-K07A
1/2 in. (12.7 mm)	1.984 in. (50.39 mm)	B16D-105A-XXX	105	B16D-K05A
3/4 in. (19.05 mm)	1.984 in. (50.39 mm)	B16D-107A-XXX	107	B16D-K07A
7/8 in. (22.23 mm)	1.984 in. (50.39 mm)	B16D-108A-XXX	108	B16D-K08A
1 in. (25.4 mm)	1.984 in. (50.39 mm)	B16D-110A-XXX	110	B16D-K10A
1-1/2 in. (38.1 mm)	1.984 in. (50.39 mm)	B16D-115A-XXX	115	B16D-K15A
2 in. (50.8 mm)	3.047 in. (77.39 mm)	B16D-220A-XXX	220	B16D-K20A

PART NUMBERING CONSTRUCTION

Blancett Turbine Flow Meters
FloClean: COP/SOP 3-A Compliant



FERRULE & METER SIZE

Ferrule: 0.984 in. 3/4 in. Clamp x 3/8 in. Bore	003
Ferrule: 0.984 in. 3/4 in. Clamp x 1/2 in. Bore	005
Ferrule: 0.984 in. 3/4 in. Clamp x 3/4 in. Bore	007
Ferrule: 1.984 in. 1-1/2 in. Clamp x 1/2 in. Bore	105
Ferrule: 1.984 in. 1-1/2 in. Clamp x 3/4 in. Bore	107
Ferrule: 1.984 in. 1-1/2 in. Clamp x 7/8 in. Bore	108
Ferrule: 1.984 in. 1-1/2 in. Clamp x 1 in. Bore	110
Ferrule: 1.984 in. 1-1/2 in. Clamp x 1-1/2 in. Bore	115
Ferrule: 3.047 in. 2-1/2 in. Clamp x 2 in. Bore	220

BEARING

Nickel Binery; Tungsten Carbide A

PICKUP

Magnetic <i>NEMA 6</i>	0
Magnetic with Pre-Amplifier <i>NEMA 6</i>	1
¹ Magnetic <i>Standard</i>	2
¹ Magnetic with Pre-Amplifier <i>Standard</i>	3
¹ Magnetic with F/I Converter (Active 4...20 mA Output)	4
¹ Magnetic <i>High Temperature (-450...450° F/-268...232° C)</i>	6
Magnetic with Pre-Amplifier <i>NEMA 6 (Less Zenor)</i>	7
¹ Magnetic with F/V Converter (Active 0...5V DC Output)	8
No Pickup	9

METER BODY HUB

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

CALIBRATION

5-Point | *Standard* A
 10-Point B
 20-Point C

¹ For Indoor Use Only

Example Part Number: B16D-110A-2AA

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www.badgermeter.com

The Americas | **Badger Meter** | 4545 West Brown Deer Rd | PO Box 245036 | Milwaukee, WI 53224-9536 | 800-876-3837 | 414-355-0400
México | **Badger Meter de las Americas, S.A. de C.V.** | Pedro Luis Ogazón N°32 | Esq. Angelina N°24 | Colonia Guadalupe Inn | CP 01050 | México, DF | México | +52-55-5662-0882
Europe, Eastern Europe Branch Office (for Poland, Latvia, Lithuania, Estonia, Ukraine, Belarus) | **Badger Meter Europe** | ul. Korfantego 6 | 44-193 Knurów | Poland | +48-32-236-8787
Europe, Middle East and Africa | **Badger Meter Europa GmbH** | Nurtinger Str 76 | 72639 Neuffen | Germany | +49-7025-9208-0
Europe, Middle East Branch Office | **Badger Meter Europe** | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
Slovakia | **Badger Meter Slovakia s.r.o.** | Racianska 109/B | 831 02 Bratislava, Slovakia | +421-2-44 63 83 01
Asia Pacific | **Badger Meter** | 80 Marine Parade Rd | 21-06 Parkway Parade | Singapore 449269 | +65-63464836
Switzerland | **Badger Meter Swiss AG** | Mittelholzerstrasse 8 | 3006 Bern | Switzerland | +41-31-932 01 11