

# 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.

### 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.

### 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.

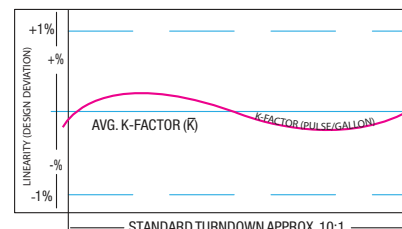
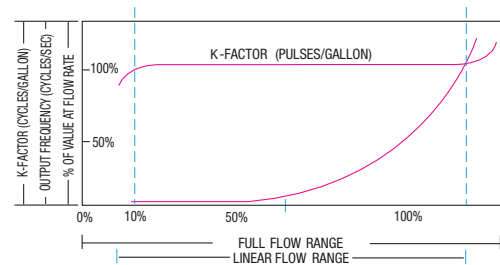


### K-FACTOR

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.

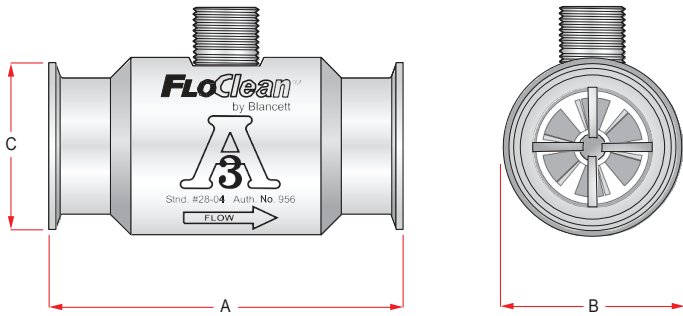
As flow increases, the frictional forces are minimized and the free-wheeling motion of the turbine rotor becomes more linear (proportional to flow). The K-factor becomes relatively constant and linear throughout the balance of the linear flow range. This is approximately a 10:1 turndown ratio from the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



**SPECIFICATIONS**

<b>Materials of Construction</b>	Body and internal wetted parts	316L stainless steel
	Bearings	Standard-nickle bindery tungsten carbide
	Turbine	Nickel plated CD4MCU stainless steel
	Shaft	Nickel bindery tungsten carbide
<b>Accuracy</b>	±1.0% of reading	
<b>Repeatability</b>	±0.1%	
<b>Calibration</b>	Water (NIST traceable calibration)	
<b>Pressure Rating</b>	1,000 psi (Rating based on tri-clamp sanitary connection)	
<b>Turbine Temperature</b>	-150...300° F (-100...149° C)	
<b>End Connections</b>	Sanitary clamp end	
<b>Mag Pickup</b>	NEMA 6; -150...300° F (-100...149° C)	

**DIMENSIONS**



Part Number Code	A	B	C
003 005 007	3.00 in. (76.2 mm)	1.46 in. (37.1 mm)	0.984 in. (25.0 mm)
105 107 108 110	4.00 in. (101.60 mm)	2.00 in. (50.80 mm)	1.984 in. (50.4 mm)
115	6.25 in. (158.8 mm)	2.33 in. (59.2 mm)	1.984 in. (50.4 mm)
220	6.50 in. (165.1 mm)	3.20 in. (81.3 mm)	3.047 in. (77.4 mm)

**SIZE CHART**

Ferrule Size	Part Number Code	Flow Rate		K-Factor Pulse/US Gal	Repair Kit Part Number
		gpm	lpm		
0.984 in. (25.0 mm)	003	0.60...3.00	2.27...11.36	20,000	B16D-K03A
0.984 in. (25.0 mm)	005	0.75...7.50	2.80...28.40	13,000	B16D-K05A
0.984 in. (25.0 mm)	007	2.00...15.00	7.50...56.80	2750	B16D-K07A
1.984 in. (50.4 mm)	105	0.75...7.50	2.80...28.40	13,000	B16D-K05A
1.984 in. (50.4 mm)	107	2.00...15.00	7.50...56.80	2750	B16D-K07A
1.984 in. (50.4 mm)	108	3.00...30.00	11.40...113.50	2686	B16D-K08A
1.984 in. (50.4 mm)	110	5.00...50.00	19.00...190.00	870	B16D-K10A
1.984 in. (50.4 mm)	115	15.00...180.00	56.80...681.40	330	B16D-K15A
3.047 in. (77.4 mm)	220	40.00...400.00	151.40...1515.20	52	B16D-K20A

**PART NUMBERING INFORMATION**

**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 Bindery; Tungsten Carbide A

**PICKUP**

Magnetic   <i>NEMA 6</i>	0
Magnetic with Pre-Amplifier   <i>NEMA 6</i>	1
<sup>1</sup> Magnetic   <i>Standard</i>	2
<sup>1</sup> Magnetic with Pre-Amplifier   <i>Standard</i>	3
<sup>1</sup> Magnetic with F/I Converter (Active 4...20 mA Output)	4
<sup>1</sup> Magnetic   <i>High Temperature (-450...450° F/-268...232° C)</i>	6
Magnetic with Pre-Amplifier   <i>NEMA 6 (Less Zenor)</i>	7
<sup>1</sup> 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   <i>Standard</i>	A
10-Point	B
20-Point	C

<sup>1</sup> For Indoor Use Only

Example Part Number: B16D-110A-2AA

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