Introduction

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 utilizes the most up-to-date polishing technology on all internal components and all materials comply with FDA requirements. FloClean meets the requirements of 3-A Sanitary Standard number 28-03 for use in clean-in-place (CIP) and sanitize-in-place (SIP) environments, as well as clean-out-of-place (COP) and sanitize-out-of-place (SOP) applications.

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 will interface 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 pick-up, an AC voltage pulse is generated. These pulses provide an output frequency that is proportional to volumetric flow.

Specifications

Materials of Construction:

Body and Internal Wetted Parts: 316L Stainless Steel
Bearings: Standard - Nickel Bindery Tungsten Carbide
Turbine: Nickel Plated CD4MCU Stainless Steel
Shaft: Nickel Bindery Tungsten Carbide
Sanitary Seals: Teflon® (CIP/SIP only)

Flow Accuracy: ±1.0% of reading
Repeatability: ±0.1%
Calibration: Water (NIST Traceable Calibration)
Pressure Rating: 1,000 psi (Rating based on Tri-clamp sanitary connection)
Turbine Temperature: -150 °F to +300 °F (-100 °C to +149 °C)
End Connections: Sanitary Clamp End
Mag Pick-up: NEMA 6; -150 °F to +300 °F (-100 °C to +149 °C)

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 the meter's internal components.

A clean-in-place (CIP) and sanitize-in-place (SIP) repair kit contains retaining screws, two rotor supports, one rotor assembly, two gaskets, and a K-factor tag. A clean-out-of-place (COP) and sanitize-out-of-place (SOP) repair kit contains two retaining rings, two rotor supports, one rotor assembly, and a K-factor tag.

For further details, contact the factory or refer to Form #4300.

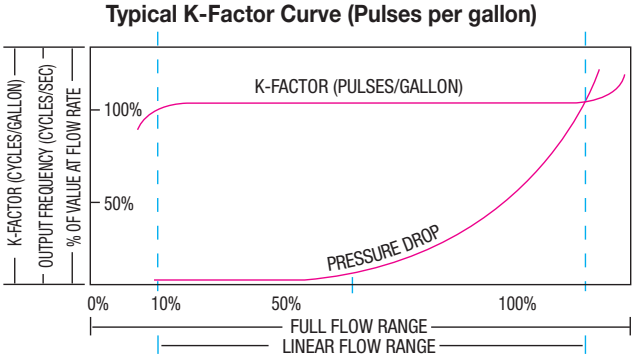
K-Factor

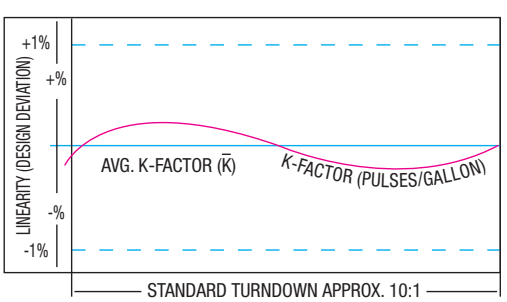
The K-Factor represents the number of output pulses transmitted per gallon of fluid passing through the turbine meter. Each turbine has a unique K-Factor. However, turbine meters are not functionally consistent throughout the full flow range of the meter.

There are several forms of "friction" inherent in turbine meters that retard the rotational movement of the turbine rotor. These frictional forces include: magnetic drag, created by electromagnetic force of pick-up 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 (Pulses per gallon)





FloClean Flow Meter Part Numbering Information

B 1 6 X - X XX A - X X X

3-A Sanitary rating
A - COP / SOP
B - CIP / SIP

Clamp Size†
0 - 3/4" Ferrule
1 - 1-1/2" Ferrule
2 - 2-1/2" Ferrule*

Meter Size: Flow Range†
03 - 3/8" : 0.6 - 3.0 GPM
05 - 1/2" : 0.75 - 7.50 GPM
07 - 3/4" : 2.00 - 15.00 GPM
08 - 7/8" : 3.00 - 30.00 GPM
10 - 1" : 5.00 - 50.00 GPM
15 - 1-1/2" : 15.0 - 180.0 GPM*
20 - 2" : 40.0 - 400.0 GPM*

Bearing Material
A - Ni Bindery Tungsten Carbide

Pick-up Option
0 - NEMA 6 Magnetic
1 - NEMA 6 Magnetic w/Pre-Amp
2 - Magnetic (non-Nema 6)
3 - Magnetic w/Pre-Amp (non-NEMA 6)
4 - Active Sensor (non-NEMA 6) with 4-20 mA
6 - High Temp (non-NEMA 6)
8 - Active Sensor (non-NEMA 6) 0-5 VDC
9 - None

Meter Body Hub
A - 1" NPT Hub*
B - No Hub

Calibration
A - Standard 5 Point
B - 10 Point
C - 20 point

†Limited to combinations shown in the FloClean Size Chart below.
**Not available with CIP/SIP*

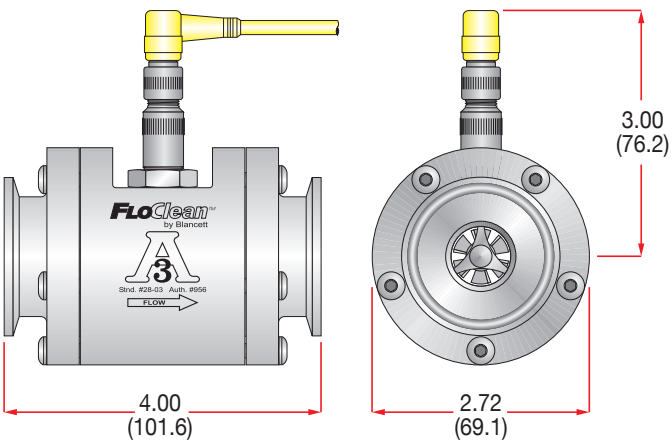
FloClean 3-A (COP) Sanitary Meter
with NEMA 6 pick-up
(P.N. B16A-110A-1BA)

FloClean Size Chart

Clamp Size	Meter Size	FLOW RATE		K-factor Pulses/Gal	REPAIR KIT PART NUMBER	
		GPM	LPM		COP/SOP	CIP/SIP
3/4"	3/8"	0.60 - 3.00	2.27 - 11.36	20,000	B16A-K03A	B16B-K03A
3/4"	1/2"	0.75 - 7.50	3.0 - 30	13,000	B16A-K05A	B16B-K05A
3/4"	3/4"	2.0 - 15.0	7.5 - 57	2,750	B16A-K07A	B16B-K07A
1-1/2"	1/2"	0.75 - 7.50	3.0 - 30	13,000	B16A-K05A	B16B-K05A
1-1/2"	3/4"	2.0 - 15.0	7.5 - 57	2,750	B16A-K07A	B16B-K07A
1-1/2"	7/8"	3.0 - 30	11 - 110	2,686	B16A-K08A	B16B-K08A
1-1/2"	1"	5.0 - 50.0	19 - 190	870	B16A-K10A	B16B-K10A
1-1/2"	1-1/2"	15 - 180	57 - 680	330	B16A-K15A	*
2-1/2"	2"	40 - 400	150 - 1,500	52	B16A-K20A	*

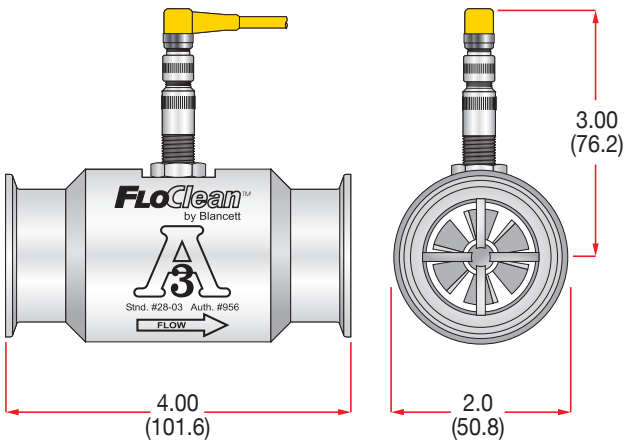
Clean-In-Place Diagram

Inches (mm)



Clean-Out-of-Place Diagram

Inches (mm)



NOTE: Diagrams based on 1-1/2" clamp size with 1": 5.00 - 50.00 GPM Meter