

Blancett®

FloClean™

- Sanitary Flow Meter -

INSTALLATION & INSTRUCTION MANUAL



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TABLE OF CONTENTS

Introduction	3
Operating Principle.....	3
Specifications.....	4
Installation Instructions	5
Wiring Instructions	8
Operational Start-up.....	9
Dimensions/Drawings	10
Troubleshooting.....	12
Part Number Information	13
Repair Kit Information.....	14
Statement of Warranty	15

NOTE: *Blancett reserves the right to make any changes or improvements to the product described in this manual at any time without notice.*

INTRODUCTION

The Blancett Model 3-A FloClean™ turbine flow meter is designed with wear resistant moving parts to provide trouble-free operation and long service life. The durable 316L stainless steel construction provides a cost efficient flow measurement system that offers excellent accuracy and repeatability. The FloClean turbine meter repair kit is designed for easy field service of a damaged flow meter, rather than replacing the entire flow meter. See **Appendix B** for repair kit information.

OPERATING PRINCIPLE

Fluid entering the meter passes through the inlet flow straightener which reduces its turbulent flow pattern and improves the fluid's velocity profile. Fluid then passes through the turbine, causing it to rotate at a speed proportional to the fluid velocity. As each turbine blade passes through the magnetic field at the base of the transducer, an AC voltage pulse is generated in the pick-up coil. See **Figure 1**. These pulses produce an output frequency proportional to the volumetric flow through the meter. The output frequency is used to represent flow rate and/or totalization of fluid passing through the turbine flow meter.

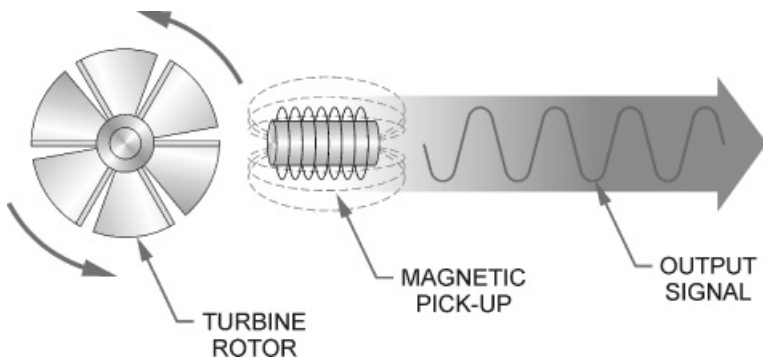


Figure 1
*Schematic illustration of electric signal
generated by rotor movement*

SPECIFICATIONS

MATERIALS of CONSTRUCTION:

Body/Internal Wetted Parts: 316L Stainless Steel

Bearings: Standard - Nickel Bindery Tungsten Carbide

Turbine: Nickel Plated CD4MCU Stainless Steel

Shaft: Nickel Bindery Tungsten Carbide

Connections: Sanitary Clamp Ends

OPERATING LIMITATIONS:

Temperature: -150 °F to +300 °F (-101 °C to +149 °C)

The meter should not be subjected to temperatures above +300 °F (+149 °C), or below -150 °F (-101 °C) or the freezing point of the metered liquid. High temperatures will damage the magnetic pick-up, while lower temperatures will limit the rotation of the rotor.

Pressure Rating: 1000 psi maximum
(rating based on Tri-Clamp® sanitary connection)

Accuracy: ±1% of reading

Repeatability: ±0.1%

Magnetic

Pick-Up (option 0)¹: NEMA 6; -150 °F to +300 °F (-100 °C to 149 °C)

¹ For other pick-up options, see page 13.

Corrosion: Contact Blancett to determine if operating liquid is compatible with materials of construction. Incompatible fluids could deteriorate internal parts and cause the meter to read inaccurately.

Pulsation and

Vibration: Severe pulsation and mechanical vibration will affect accuracy and shorten the life of the meter.

Filtration: If small particles are present in the fluid, Blancett recommends that a strainer be installed upstream of the meter. See **Table 1** for filtration recommendations.

INSTALLATION INSTRUCTIONS

Prior to installation, the flow meter should be checked internally for foreign material and to ensure that the rotor spins freely. Fluid lines should also be cleared of all debris.

The flow meter must be installed with the flow arrow, etched on the exterior of the meter body, pointing in the direction of fluid flow. Though the meter is designed to function in any position, it is recommended, where possible, to install horizontally with the magnetic pick-up facing upward.

The liquid being measured must be free of any large particles that may obstruct rotation of the rotor. If particles are present, a mesh strainer should be installed

Part Number	Ferrule Size	Strainer Size	Clearance
B16A-003A-XXX	0.984"	60 × 60	.0092
B16A-005A-XXX	0.984"	60 × 60	.0092
B16A-007A-XXX	0.984"	60 × 60	.0092
B16A-105A-XXX	1.984"	60 × 60	.0090
B16A-107A-XXX	1.984"	60 × 60	.0092
B16A-108A-XXX	1.984"	60 × 60	.0092
B16A-110A-XXX	1.984"	60 × 60	.0092
B16A-115A-XXX	1.984"	20 × 20	.0340
B16A-220A-XXX	3.047"	10 × 10	.0650

Table 1
Filtration recommendations

The preferred plumbing setup is one containing a by-pass line that allows meter inspection and repair without interrupting flow. See **Figure 3** on page 7. If a by-pass line is not utilized, it is important that all control valves be located downstream of the flow meter. See **Figure 4** on page 7.

CAUTION: *Damage can be caused by striking an empty meter with a high velocity flow stream.*

This is true with any restriction in the flow line that may cause the liquid to flash. If necessary, air eliminators should be installed to ensure that the meter is not incorrectly measuring entrained air or gas.

It is recommended that a minimum length, equal to ten (10) pipe diameters of straight pipe, be installed on the upstream side and five (5) diameters on the downstream side of the flow meter. Otherwise, meter accuracy may be affected. Piping should be the same size as the meter bore or threaded port size.

Do not locate the flow meter or connection cable close to electric motors, transformers, sparking devices, high voltage lines, or place connecting cable in conduit with wires furnishing power for such devices. These devices can induce false signals in the flow meter coil or cable causing the meter to read inaccurately.

If problems arise with the flow meter and monitor, consult the Troubleshooting Guide in **Appendix A** on page 12. If further problems arise, consult the factory.

If the internal components of the turbine flow meter are damaged beyond repair, turbine meter repair kits are available. Information pertaining to the turbine meter repair kits is referenced in **Appendix C** on page 14.

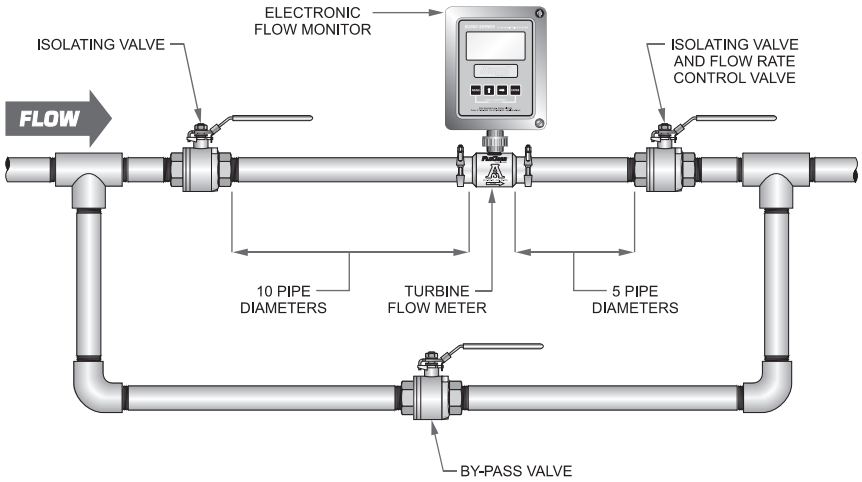


Figure 3
Meter installation utilizing a by-pass line

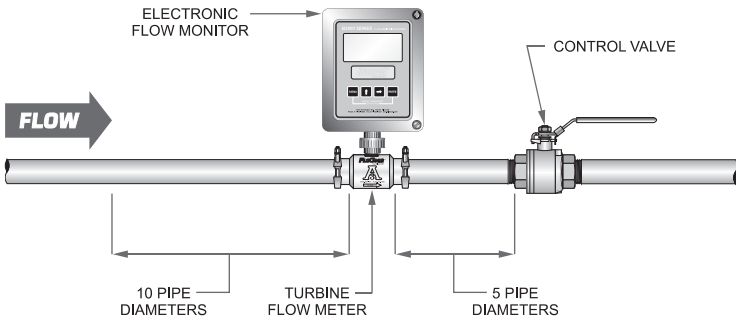
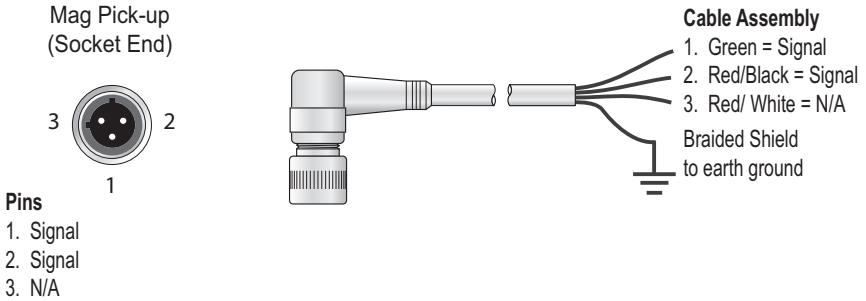


Figure 4
Meter installation without utilizing a by-pass line

WIRING INSTRUCTIONS

Typical wiring configurations for the NEMA 6 standard magnetic pick-up and the NEMA 6 magnetic pick-up with preamplifier are included in **Figure 5**.

NEMA 6 Standard Mag Pick-up (Option 0)



NEMA 6 Mag Pick-up with Preamp (Option 1)

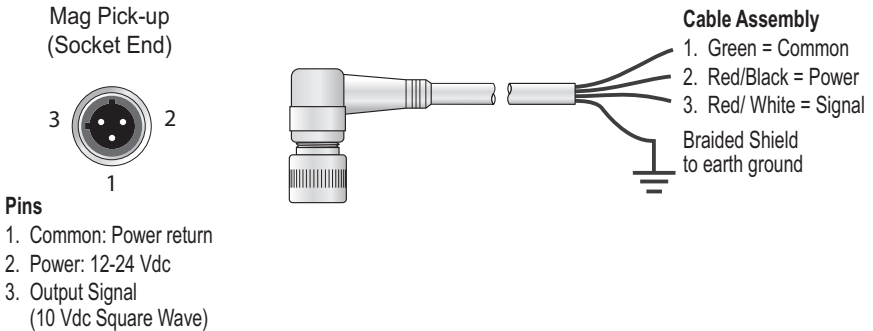


Figure 5

Typical wiring configurations for NEMA 6 magnetic pick-ups

OPERATIONAL START-UP

The following steps should be followed when installing and starting the meter.

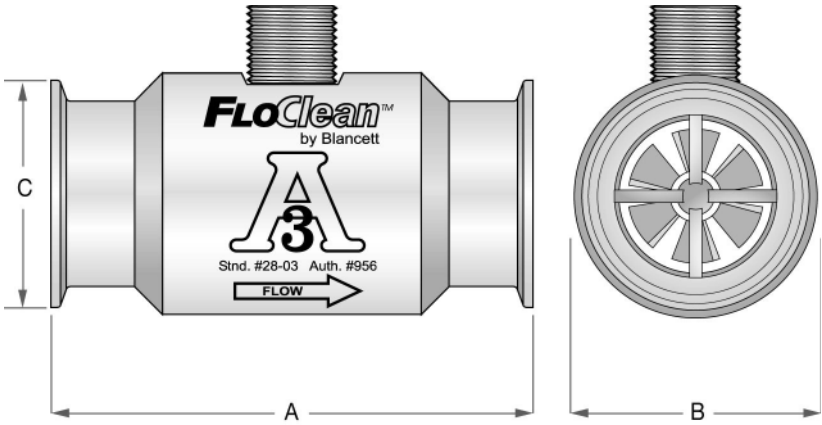
WARNING: *Make sure that fluid flow has been shut off and pressure in the line released before attempting to install the meter in an existing system.*

1. After meter installation, close the isolation valves and open the by-pass valve. Flow liquid through the by-pass valve for sufficient time to eliminate any air or gas in the flow line.

CAUTION: *High velocity air or gas may damage the internal components of the meter.*

2. Open upstream isolating valve slowly to eliminate hydraulic shock while charging the meter with the liquid. Open the valve to full open.
3. Open downstream isolating valve to permit meter to operate.
4. Close the by-pass valve to a full closed position.
5. Adjust the downstream valve to provide the required flow rate through the meter. NOTE: The downstream valve may be used as a control valve.

DIMENSIONS/DRAWINGS



Part No.	A Length In (mm)	B Width In (mm)	C Ferrule Size In (mm)
B16A-0XXA-XXX	3.00 (76.2)	1.46 (37.1)	0.984 (25.0)
B16A-1XXA-XXX	4.00 (101.6)	2.00 (50.8)	1.984 (50.4)
B16A-1XXA-XXX ¹	6.25 (158.8)	2.33 (59.2)	1.984 (50.4)
B16A-2XXA-XXX	6.50 (165.1)	3.20 (81.3)	3.047 (77.4)

¹ 15.0 - 180.0 GPM flow range only.

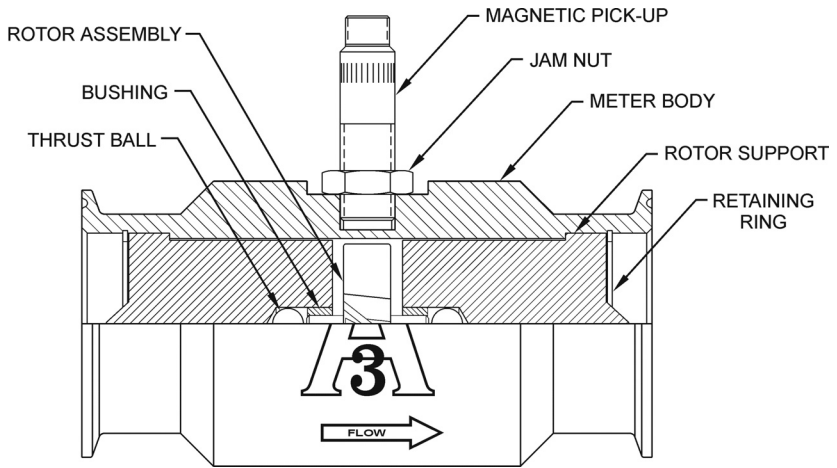


Figure 5
Typical cross section of FloClean

APPENDIX A

TROUBLESHOOTING GUIDE

Trouble	Possible Cause	Remedy
Meter indicates higher than actual flow rate	<ul style="list-style-type: none"> • Cavitation • Debris on rotor support • Build up of foreign material on meter bore • Gas in liquid 	<ul style="list-style-type: none"> • Increase back pressure • Clean meter • Clean meter • Install gas eliminator ahead of meter
Meter indicates lower than actual flow rate	<ul style="list-style-type: none"> • Debris on rotor • Worn bearing • Viscosity higher than calibrated 	<ul style="list-style-type: none"> • Clean meter and add filter • Install new repair kit • Recalibrate monitor
Erratic system indication, meter alone works well (remote monitor application only)	Ground loop in shielding	Ground shield one place only. Look for internal electronic instrument ground. Reroute cables away from electrical noise.
Indicator shows flow when shut off	Mechanical vibration causes rotor to oscillate without turning	Isolate meter
No flow indication, full or partial open position	Fluid shock, full flow into dry meter or impact caused bearing separation or broken rotor shaft	Rebuild meter with repair kit and recalibrate monitor. Move to location where meter is full on start-up or add downstream flow control valve.
Erratic indication at low flow, good indication at high flow	Rotor has foreign material wrapped around it	Clean meter and add filter
No flow indication	Faulty pick-up	Replace pick-up
System works perfect, except indicates lower flow over entire range	By-pass flow, leak	Repair or replace by-pass valves or faulty solenoid valves
Meter indicating high flow, upstream piping at meter smaller than meter bore	Fluid jet impingement on rotor	Change piping
Opposite effects of above	Viscosity lower than calibrated	Change temperature, change fluid or recalibrate meter

APPENDIX B

PART NUMBER INFORMATION

B 16 A - X X X A - X X X

3-A Sanitary Rating

A - COP/SOP

Ferrule Size

(see chart below)

0 - 0.984"

1 - 1.984"

2 - 3.047"

Meter Size: Flow Range

(see chart below)

03 - 0.6 - 3.0 GPM

05 - 0.75 - 7.50 GPM

07 - 2.0 - 15.0 GPM

08 - 3.0 - 30.0 GPM

10 - 5.0 - 50.0 GPM

15 - 15.0 - 180.0 GPM

20 - 40.0 - 400.0 GPM

Bearing Material

A - Ni Bindery
Tungsten
Carbide

Calibration

A - 5 Point (std)

B - 10 Point

C - 20 Point

Meter Body Hub

A - With Hub¹

B - No Hub

Pick-up Option

0 - NEMA 6 Magnetic

1 - NEMA 6 Magnetic w/Preamp

2 - Magnetic²

3 - Magnetic w/Preamp²

4 - Active Sensor (B220-950) 4-20 mA²

5 - High Temp²

6 - Active Sensor (B220-951) 0-5 VDC²

7 - None

¹ 1/2" NPT hub for Body Size 0; 1" NPT hub for Body sizes 1 and 2

² Indoor use only

FloClean SIZE CHART

Ferrule Size	Flow Ranges		K-factor Pulses/Gal
	GPM	LPM	
0.984"	0.6 - 3.0	2.3 - 11.4	20,000
0.984"	0.75 - 7.5	2.8 - 28.4	13,000
0.984"	2.0 - 15.0	7.5 - 56.8	2,750
1.984"	0.75 - 7.5	2.8 - 28.4	13,000
1.984"	2.0 - 15.0	7.5 - 56.8	2,750
1.984"	3.0 - 30.0	11.4 - 113.5	2,686
1.984"	5.0 - 50.0	19.0 - 190.0	870
1.984"	15.0 - 180.0	56.8 - 681.4	330
3.047"	40.0 - 400.0	151.4 - 1514.2	52

APPENDIX C

REPAIR KIT INFORMATION

Ferrule Size	Repair Kit Fits Meter Part Number	Repair Kit Part Number
0.984"	B16A-003A-XXX	B16A-K03A
0.984"	B16A-005A-XXX	B16A-K05A
0.984"	B16A-007A-XXX	B16A-K07A
1.984"	B16A-105A-XXX	B16A-K05A
1.984"	B16A-107A-XXX	B16A-K07A
1.984"	B16A-108A-XXX	B16A-K08A
1.984"	B16A-110A-XXX	B16A-K10A
1.984"	B16A-115A-XXX	B16A-K15A
3.047"	B16A-220A-XXX	B16A-K20A

STATEMENT OF WARRANTY

Blancett Flow Meters, Division of Racine Federated Inc. warrants to the end purchaser, for a period of one year from the date of shipment from the factory, that all flow meters manufactured by it are free from defects in materials and workmanship. This warranty does not cover products that have been damaged due to defects caused by misapplication, abuse, lack of maintenance, modified or improper installation. Blancett's obligation under this warranty is limited to the repair or replacement of a defective product, at no charge to the end purchaser, if the product is inspected by Blancett and found to be defective. Repair or replacement is at Blancett's discretion. A return goods authorization (RGA) number must be obtained from Blancett before any product may be returned for warranty repair or replacement. The product must be thoroughly cleaned and any process chemicals removed before it will be accepted for return.

The purchaser must determine the applicability of the product for its desired use and assumes all risks in connection therewith. Blancett assumes no responsibility or liability for any omissions or errors in connection with the use of its products. Blancett will under no circumstances be liable for any incidental, consequential, contingent or special damages or loss to any person or property arising out of the failure of any product, component or accessory.

All expressed or implied warranties, including **the implied warranty of merchantability and the implied warranty of fitness for a particular purpose or application are expressly disclaimed** and shall not apply to any products sold or services rendered by Blancett.

The above warranty supersedes and is in lieu of all other warranties, either expressed or implied and all other obligations or liabilities. No agent or representative has any authority to alter the terms of this warranty in any way.

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