

# *Blancett*®

## **Model 1200 Turbine Flow Meter**

### **INSTALLATION & INSTRUCTION MANUAL**



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**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 1200 in-line turbine flow meter was engineered for applications in high corrosive environments. Developed for use in petrochemical and other process industries with liquid chemical flows, the Model 1200 turbine provides accuracy and durability in aggressive industrial environments. The meter features a 303 stainless steel body and internal wetted parts, with two Type 440 stainless steel ball bearings.

## OPERATING PRINCIPLE

Fluid moving through the turbine flow meter causes the rotor to rotate at a speed proportional to the fluid velocity. As rotor blades pass the RF pick-up, it detects the shift in the carrier frequency, and then generates a square wave output signal that is proportional to the rotation of the rotor. This signal is used to represent flow rate and totalization of fluid passing through the turbine flow meter.

## SPECIFICATIONS

### MATERIALS of CONSTRUCTION:

**Body:** 303 Stainless Steel

**Rotor:** CD4MCU Stainless Steel

**Bearings:** Two (2) Type 440 Stainless Steel Ball Bearings

**Rotor Support and Shaft:** 303 Stainless Steel

### OPERATING LIMITATIONS:

#### Temperature:

Meter -60 °F to +350 °F (-51 °C to +177 °C)

RF Pick-up -150 °F to +325 °F (-101 °C to +162 °C)

**Pressure:** 4,000 PSI (275 Bar) maximum

***WARNING:*** Pressure in excess of allowable rating may cause the housing to burst and cause serious personal injury.

**Accuracy:**  $\pm 0.5\%$  of reading

**Repeatability:**  $\pm 0.1\%$

**Calibration:** Water (NIST Traceable Calibration)

**Corrosion:** All Blancett Model 1200 turbine meters are constructed of stainless steel. The operator must ensure that the operating fluid is compatible with these materials. Incompatible fluids can cause deterioration of internal components and cause a reduction in meter accuracy.

### **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** on page 5 for filtration recommendations).

## **RF PREAMPLIFIER:**

**Input Signal:** 1 mil Henry carrier pick-up

**Output Signal:** 10.0 Volts peak to peak square wave

### **Temperature:**

Module -20 °F to +160 °F (-7 °C to +71 °C)

Pick-up -150 °F to +325 °F (-101 °C to +162 °C)

**Power:** 7 to 30 Volts DC

### **Distance**

**Specification:** 50 feet maximum between pick-up and RF preamplifier (two wire no. 18, twisted shielded pair)

1000 feet maximum between preamplifier and receiving unit (two wire no. 18, twisted shielded pair)

**Electrical Connection:** Terminal strip

**Housing:** Epoxy encapsulated module

# 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 checked and 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 the rotation of the rotor. If particles are present, a mesh strainer should be installed upstream before operation of the flow meter. (See **Table 1**)

Part Number	Size	Strainer Mesh	Clearance
B121-225	¼"	60 × 60	.0092
B121-250	½"	60 × 60	.0092
B121-275	¾"	60 × 60	.0092

**Table 1**  
*Filtration recommendations*

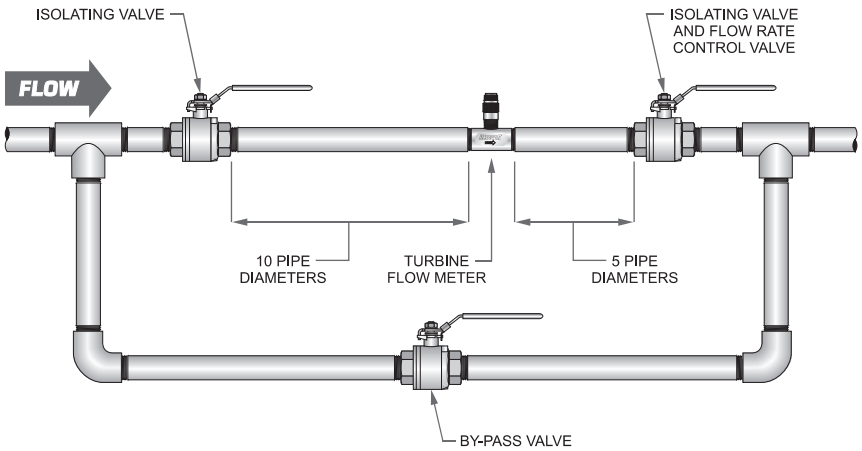
The preferred plumbing setup is one containing a by-pass line that allows meter inspection and repair without interrupting flow. If a by-pass line is not utilized, it is important that all control valves be located downstream of the flow meter. See **Figures 1 and 2** on page 6.

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

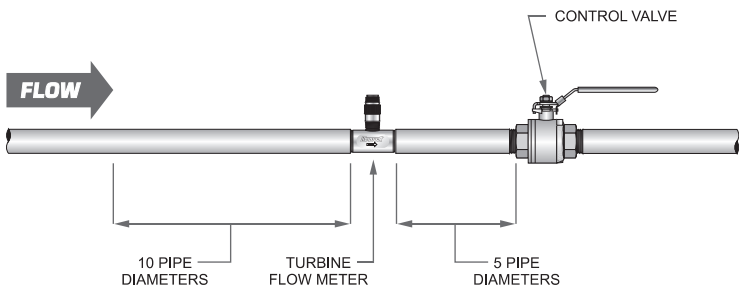
This is true with any restriction in the flow line that may cause the liquid to flash. If necessary, air eliminators should be installed to ensure that the meter is not incorrectly measuring entrained air or gas.

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 (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.

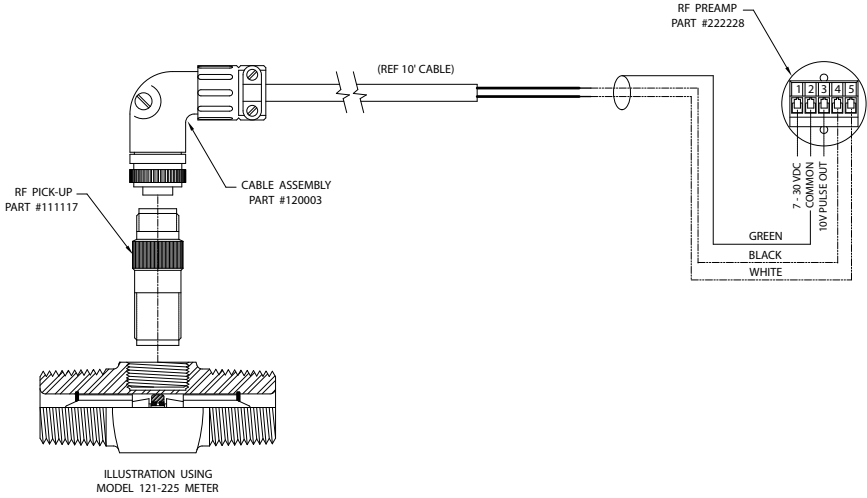


**Figure 1**  
*Meter installation utilizing a by-pass line*



**Figure 2**  
*Meter installation without utilizing a by-pass line*

# WIRING INSTRUCTIONS



**Figure 3**  
*Wiring diagram with RF pick-up,  
cable assembly and preamplifier*

Terminal	Description	Notes
1	Power	7 to 30 VDC
2	Common	Power Return
3	Output Signal	10V Square Wave
4	Input	1 mil Henry RF Pick-up
5	Input	1 mil Henry RF Pick-up

## OPERATIONAL START-UP

The following practices should be observed 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.

# APPENDIX A

## TROUBLESHOOTING GUIDE

<b>Trouble</b>	<b>Possible Cause</b>	<b>Remedy</b>
Meter indicates higher than actual flow rate	<ul style="list-style-type: none"> <li>• Cavitation</li> <li>• Debris on rotor support</li> </ul>	<ul style="list-style-type: none"> <li>• Increase back pressure</li> <li>• Clean meter</li> </ul>
Meter indicates lower than actual flow rate	<ul style="list-style-type: none"> <li>• Debris on rotor</li> <li>• Worn bearing</li> <li>• Viscosity higher than calibrated</li> </ul>	<ul style="list-style-type: none"> <li>• Clean meter and add filter</li> <li>• Replace meter</li> <li>• Change temperature; change fluid; recalibrate meter</li> </ul>
Erratic system indication, meter alone works well	Ground loop in shielding	Ground shield one place only
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	New bearing required. Move to location where meter is full of fluid on start-up.
Erratic indication at low flow, good indication at high flow	Low instrument sensitivity. 10mV rms turbine signal is being lowered by loading of electronics or instrumentation can't sense low level signals.	Amplify signal
No flow indication	Faulty pick-up	Replace pick-up, recalibrate as necessary
System works perfect, except indicates lower flow over entire range	By-pass flow, leak	Eliminate by-pass valves, leak. Repair or replace faulty solenoid valves.
Meter indicating high flow, upstream piping at meter smaller than meter bore	Fluid jet impingement on rotor, critical in gas	Change piping
Opposite effects of above	Viscosity lower than calibrated	Change temperature, change fluid or recalibrate meter
Mass flow indication wrong	Wrong fluid density, critical in gas	Check fluid, electronics
Erratic or wrong indication of flow	Loose pick-up	Tighten pick-up
Does not repeat at low flows. Repeats at high flow.	System resolution readability	Increase resolution, i.e., 1 out of 100 = 1%

## APPENDIX B

### PART NUMBER INFORMATION

Part Number	End Connection	Flow Ranges		Approx K-factor Pulses/Gal
		GPM	LPM	
B121-225	½" Male NPT	0.25 - 2.5	0.57 - 9.46	29,000 - 33,000
B121-250	½" Female NPT	0.75 - 7.5	0.95 - 28.39	8,500 - 9,500
B121-275	1" Male NPT	2.5 - 25	1.89 - 94.64	2,800 - 3,000

## 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 purchase, 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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