# B142 GAS QUIKSERT®
# TURBINE FLOW SENSOR

## INSTALLATION
## MANUAL



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# FIGURES



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

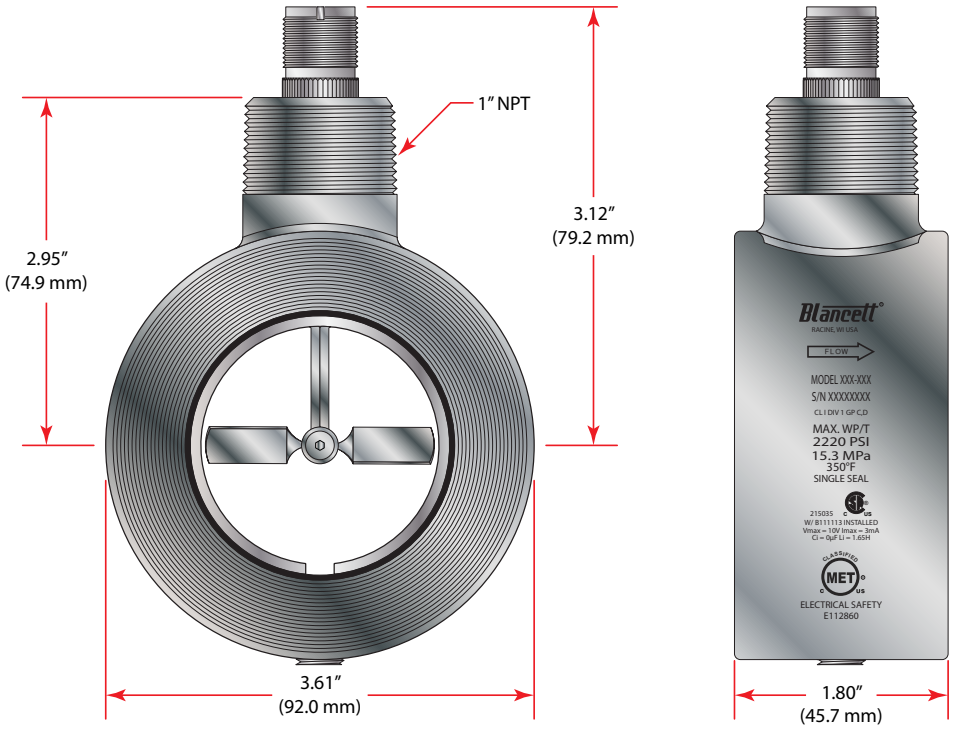


***FIGURE 1 - DIMENSIONS***

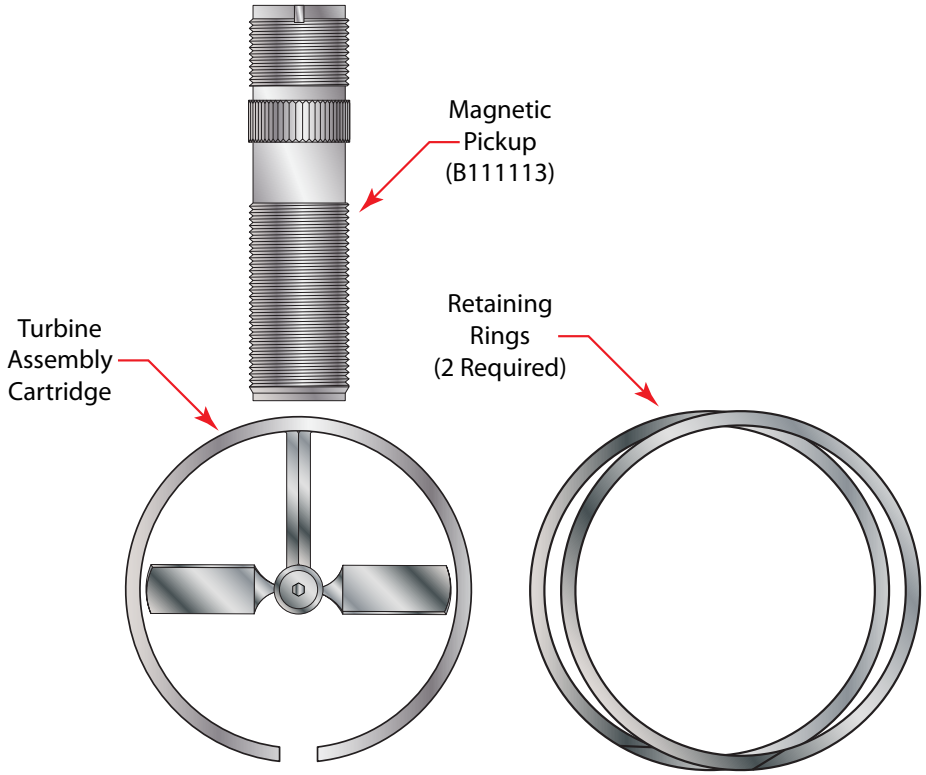


***FIGURE 2 - PARTS IDENTIFICATION***

# INTRODUCTION

The B142 gas turbine flow meter is designed with wear resistant moving parts to provide a long service life with very low maintenance. Should the B142 meter be damaged the turbine is easily replaced in the field with a drop in repair kit rather than replacing the entire flow meter (see the Appendix for repair kit information). Repair parts are constructed of stainless steel alloy and tungsten carbide.

# THEORY OF OPERATION

Gas moving through the turbine flow meter causes the rotor to turn at a speed proportional to the flow rate. The rotor blade cuts the magnetic field that surrounds the magnetic pick-up, which in turn generates a frequency output signal that is directly proportional to the volumetric flow rate (***Figure 3***). The signal is used to represent flow rate and/or totalization of a gas passing through the turbine flow meter and is always expressed as the number of electric pulses that the meter produces per cubic feet. This value, called the K-factor, is constant over each flow meter's range and is unique to the meter.

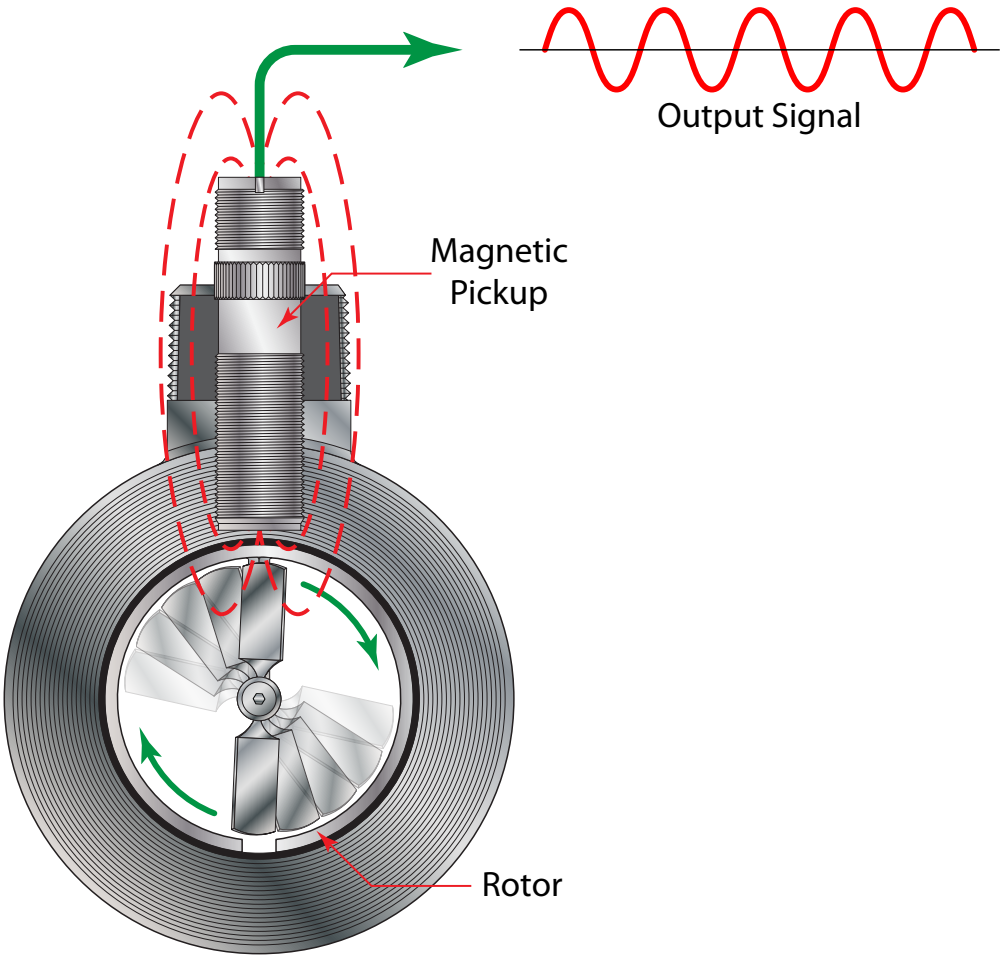


***FIGURE 3 - B142 TURBINE FLOW SENSORS***

# INSTALLATION

Before installation, the flow meter should be checked internally for foreign material and to be sure that the rotor spins freely. Gas lines should also be cleared of all debris. The flow meter must be installed with the flow indication arrow, etched on the exterior of the meter body, pointing in the correct direction of flow. The preferred mounting orientation is to have the meter installed in horizontal piping, with the pick-up facing upward. However, the meter will function in any position.

While the flow meter body and magnetic pickup are sold as separate items, in most instances they are ordered at the same time and come assembled from the factory. If the magnetic pickup was not ordered with the meter body or replacement of the magnetic pickup becomes necessary, all that is needed to install it is to thread the pickup into the pickup port until it is bottomed out. Finger tightening is all that is required for proper installation.

The gas that is to be measured must be free from any large particles that may obstruct rotor from turning. If particles are present, a filter of at least 60 mesh (0.0092 clearance) should be installed upstream before operation of the flow meter).

The preferred plumbing setup is one containing a bypass line (***Figure 4***) that allows for meter inspection and repair without interrupting flow. If a by-pass line is not utilized, it is important that all control valves be located down-stream of the flow meter (***Figure 5***).

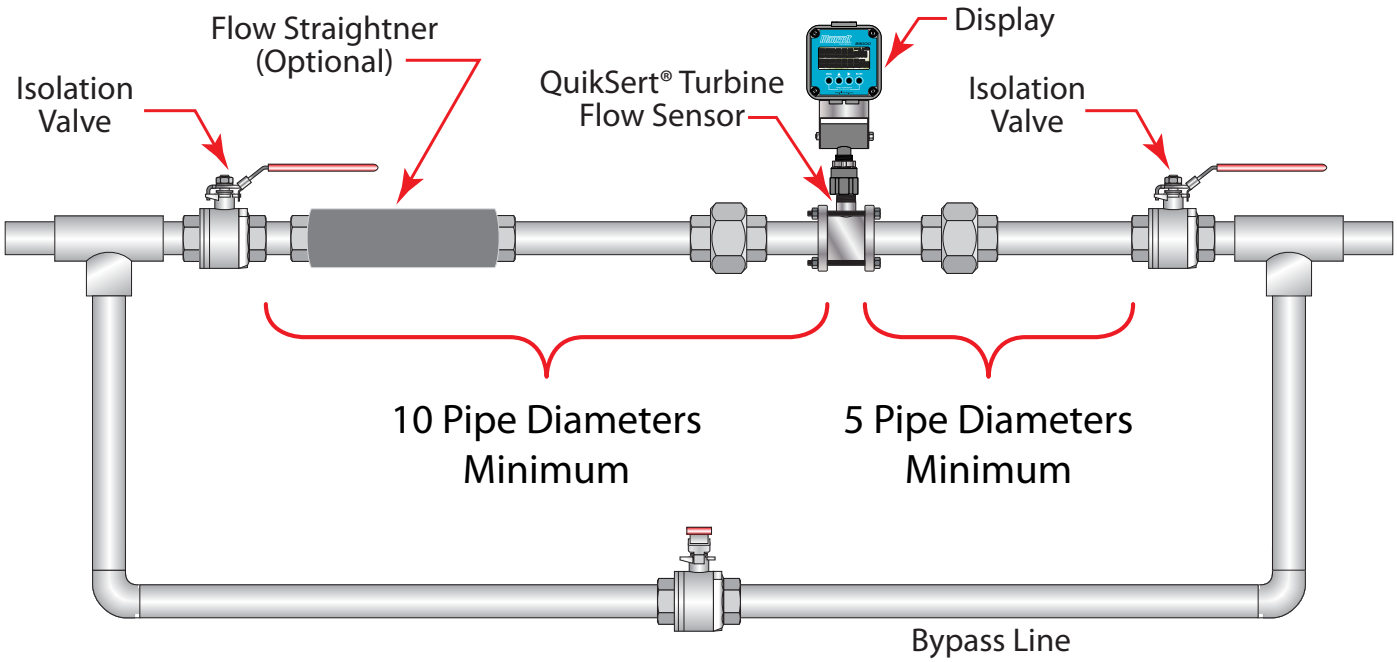


***FIGURE 4 - BYPASS LINE INSTALLATION***

It is recommended that a minimum length, equal to ten **(10)** pipe diameters of straight pipe, be installed on the up-stream side and five **(5)** diameters on the down-stream side of the flow meter. Otherwise meter accuracy may be affected. Piping should be the same size as the flange size. If adequate straight runs of pipe are not available or if erratic flow readings are experienced, place a bundled-tube flow straightener upstream of the flow meter installation.

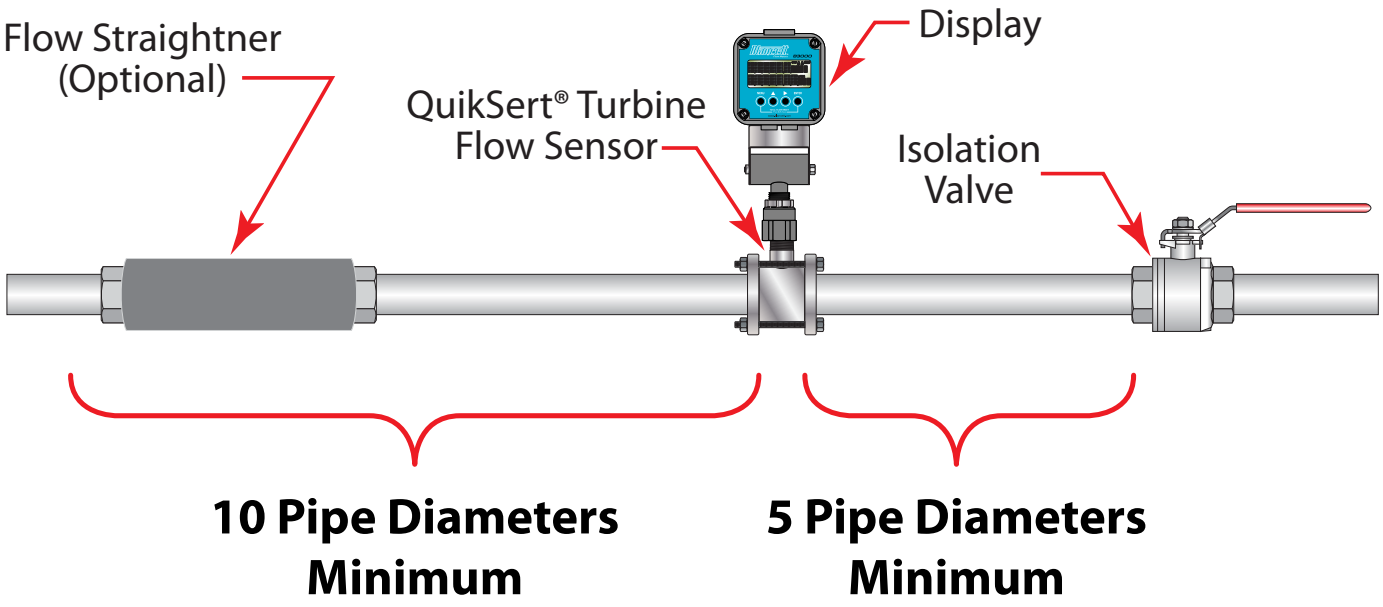


***FIGURE 5 - INSTALLATION WITHOUT BYPASS LINE***

## OTHER FACTORS AFFECTING PERFORMANCE

Do not locate the flow meter or connection cable close to electronic motors, transforming, 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.

Severe pulsation and/or severe mechanical vibration will affect accuracy and shorten the life of the meter. Steps should be taken to remedy these conditions if they are present.

***NOTE:*** *Incompatible gases will deteriorate internal parts, and cause the meter to read inaccurately.*

## MOUNTING

The B142 turbine meter is supplied with two "centering rings" that make installation straightforward. Gaskets and either bolts or threaded rods supplied by the customer are also required. ***See figure 4***.

1) Insert the bottom or bottom two bolts between the mounting flanges and install nuts loosely.
2) Place the centering rings on the outside diameter of the B142 meter and align the bolt notches.
3) Place the centering rings with the B142 meter installed on the two bottom bolts between the flanges.
4) Insert and center the face gaskets.
5) Insert the remaining bolts and nuts.
6 ) Tighten nuts to the flange manufacturers specifications.

If problems arise with the flow meter or monitor consult the **Troubleshooting Guide**. If further problems arise, consult factory. If the internal components of the turbine flow meter are damaged beyond repair, replacement turbine cartridges are available.

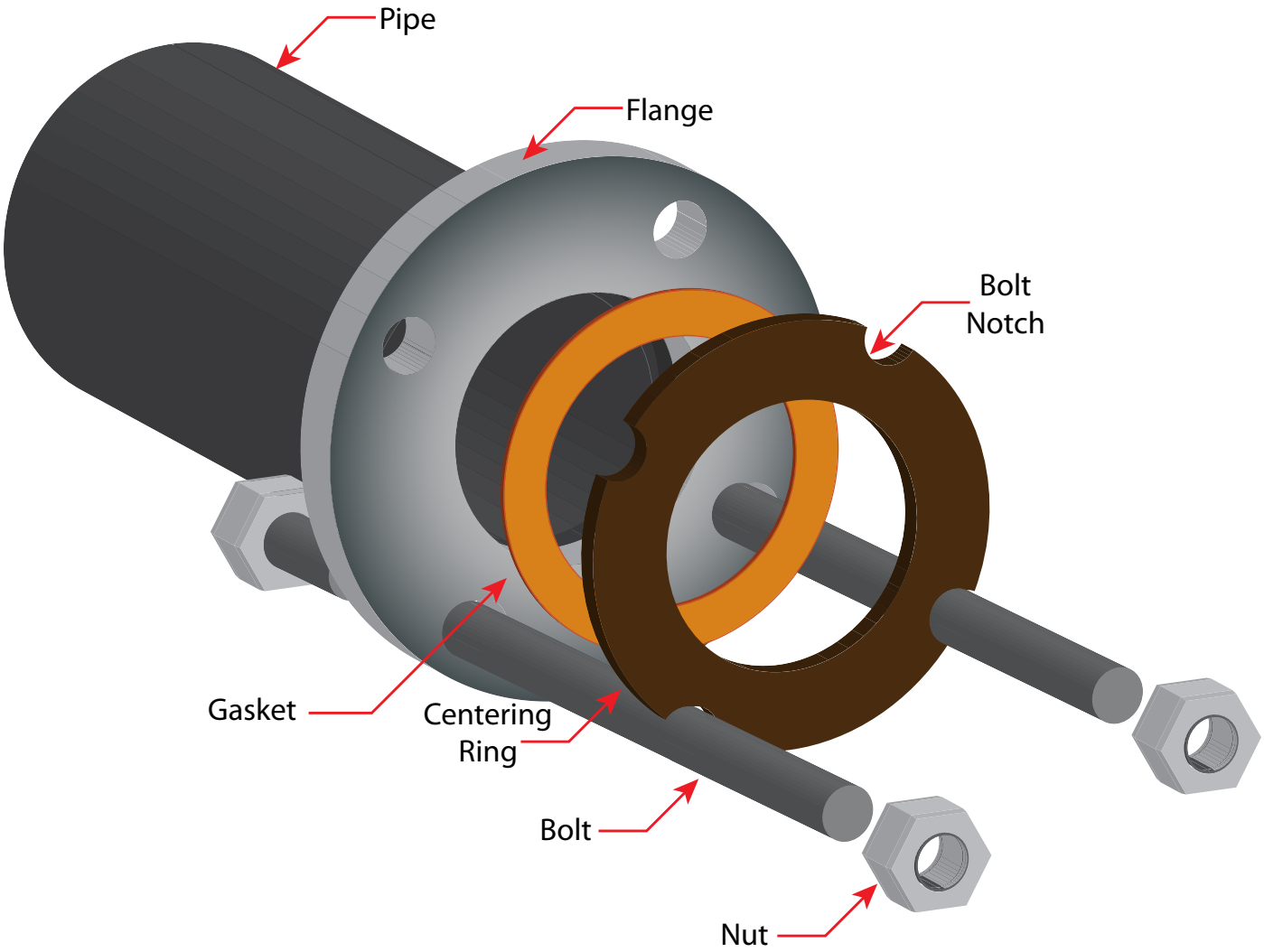


***FIGURE 6 - INSTALLATION USING CENTERING RINGS***

## OPERATIONAL STARTUP

The following practices should be observed when installing and starting the meter.

**Warning:** Make sure that gas 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.
2) Open up-stream isolating valve slowly to eliminate hydraulic shock while charging the meter with gas. Open the valve to full open.
3) Open down-stream isolating valve to permit meter to operate.
4) Close the bypass valve to a full off 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.*

# CALIBRATION

The meter is calibrated on clean, dry air at the factory and tagged with a K-Factor (pulses per cubic foot). All attached electronics have been calibrated to match the flow meter's K-Factor. Ensure that the mating factory display is configured to the proper operating pressures and temperatures of your application. The B142 meter can be re-calibrated by any conventional meter proving processes used to calibrate standard meters.

The following graphs show how the capacities of the flow meters vary with pressure variations. Separate graphs are provided for High Medium and Low flow ranges.

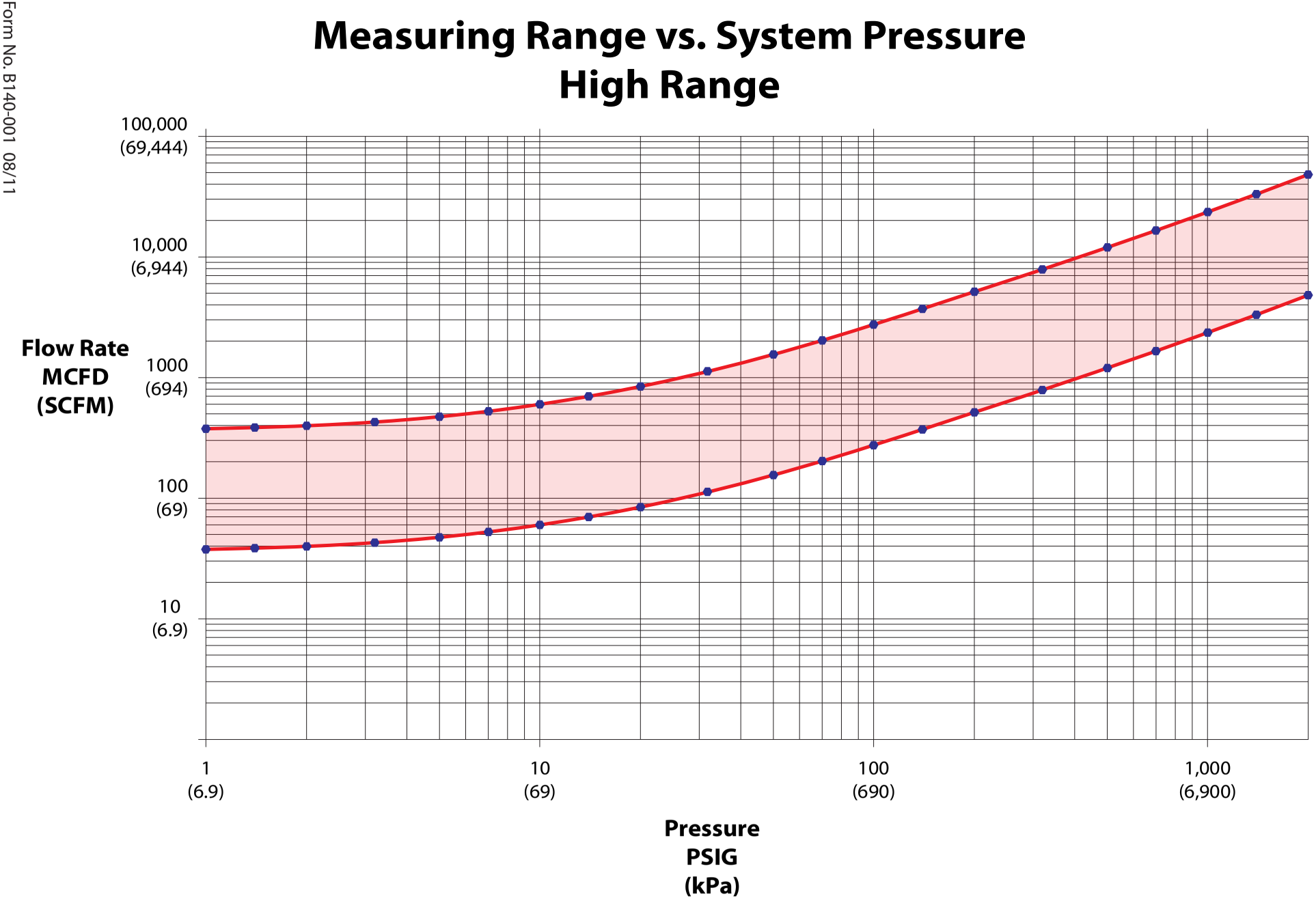


*FIGURE 7 - HIGH RANGE FLOW RATES*

# Measuring Range vs. System Pressure
## Mid Range

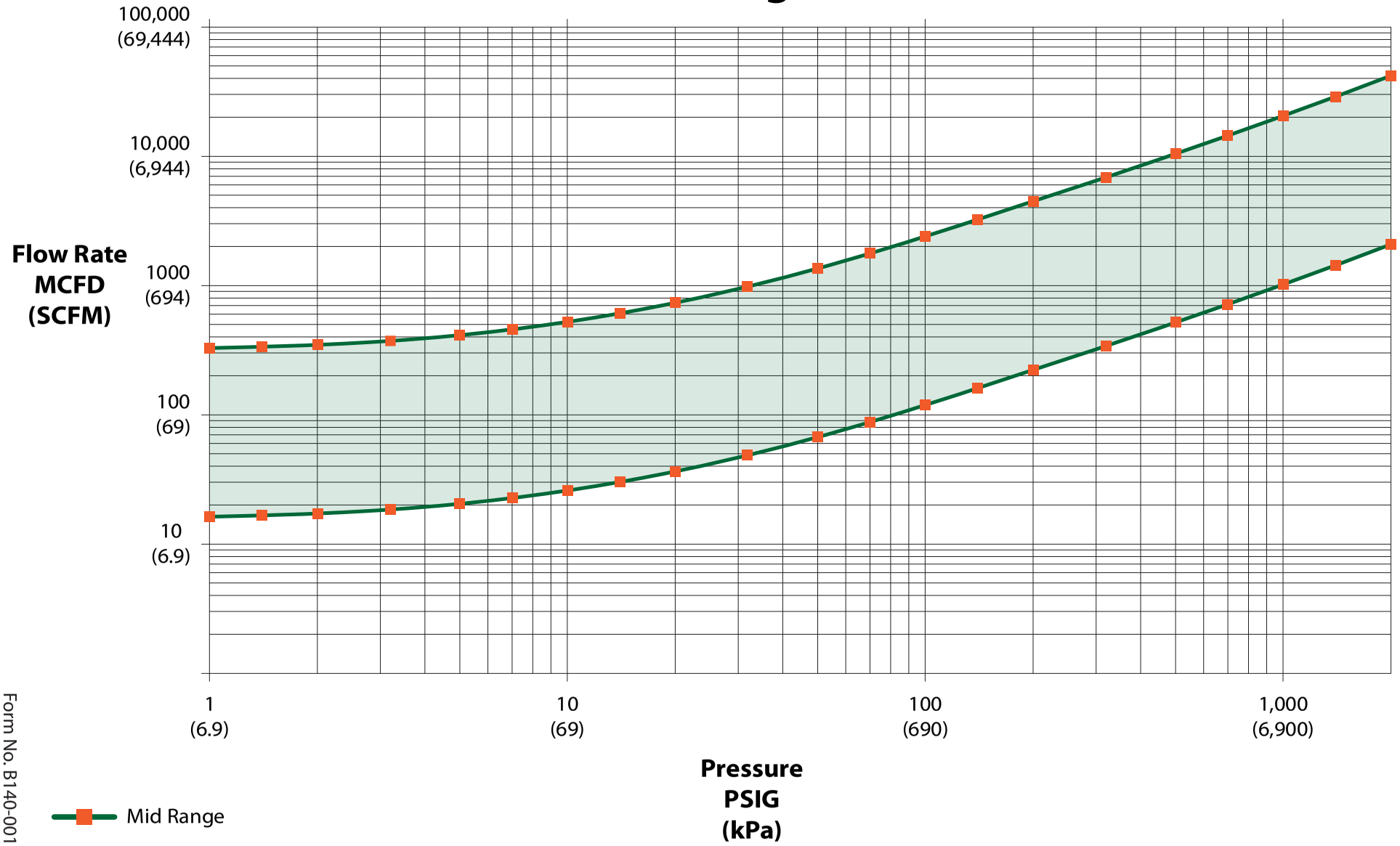


*FIGURE 8 - MID RANGE FLOW RATES*

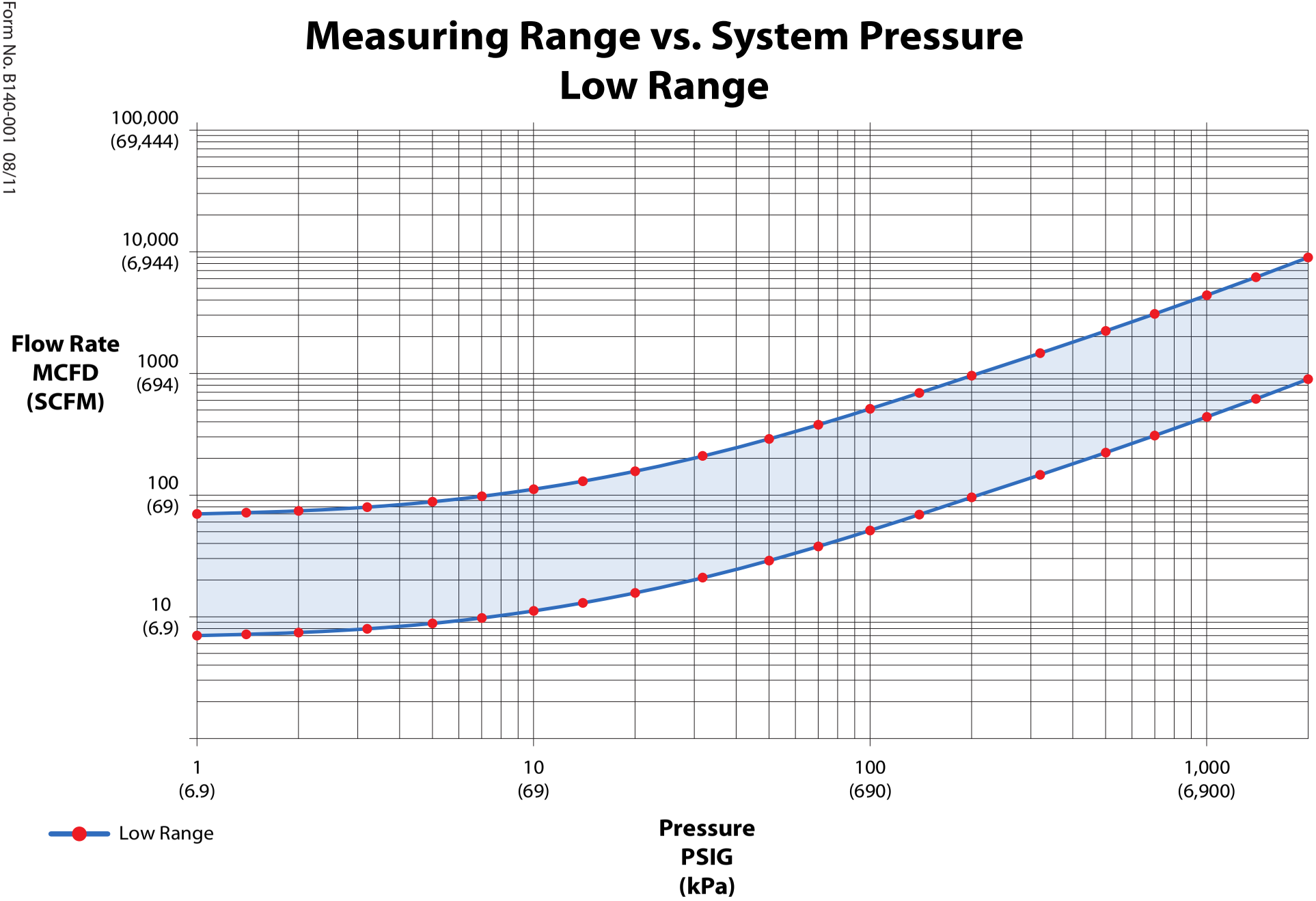


*FIGURE 9 - LOW RANGE FLOW RATES*

# SPECIFICATIONS

| | |
|---|---|
| **Physical** | |
| **Installation** | Mounts between 2" ANSI raised face flanges. Horizontal or vertical mounting. |
| **Flow Range/Nominal K-Factors** | See pressure vs flow graphs **[Low Range]** **[Mid Range]** **[High Range]** |
| **Low Range** | 7-70 ACFM (10-100 MCFD)/365 Pulses per ACF (12,900 Pulses per $m^3$) |
| **Mid Range** | 14-210 ACFM (20-300 MCFD)/190 Pulses per ACF (6,710 Pulses per $m^3$) |
| **High Range** | 35-350 ACFM (50-500 MCFD)/85 Pulses per ACF (3,000 Pulses per $m^3$) |
| **Working Pressure** | Vacuum to 2,220 PSIG (15.3 MPa) |
| **Pressure Drop** | 3" of water column (7.5 mbar) at maximum rated flow (dry air). |
| **Pressure Port** | ⅛" NPTF (Plugged) |
| **Temperature** | -40 °F to 330 °F (-40 °C to 165 °C) |
| **Electrical** | |
| **Output Voltage** | 100 $mV_{p-p}$ minimum when used with Blancett B111113 magnetic pickup. |
| **Accuracy** | |
| **Linearity** | ± 2% of reading over the specified measurement range. |
| **Uncertainty** | ± 1% of reading (when calibration data is entered into an intelligent Blancett monitor/ transmitter) |
| **Repeatability** | ± 0.5% |
| **Certifications** | |
| **Intrinsically Safe** | Class I Division 1 Groups C, D<br>Entity Parameters with Blancett B111113 magnetic pickup installed] for US and Canada. Complies with UL 913 and CSA 22.2 No. 157-92<br>$V_{max}$ = 10 V<br>$I_{max}$ = 3 mA<br>Ci = 0 µF<br>Li = 1.65 H |
| **Explosion Proof** | Class I Division 1 Groups C, D. Complies with UL1203 and CSA C22.2 No. 30-M1986 |
| **Single Seal** | Complies with ANSI/ISA 12.27.01-2003 |
| **Construction** | |
| **Body and Cartridge** | 316/316L Stainless Steel |
| **Bearing Mounts** | 304 Stainless Steel |
| **Set Screws**<br>**Pressure Port Plug** | 316 Stainless Steel |
| **Bearings and Rotor Shaft** | Tungsten Carbide |
| **Rotor** | 410 Stainless Steel |
| **Connections** | |
| **Pickup** | Mates with AN3106A-10SL |
| **Conduit** | 1" NPT (25.4 mm) |

# APPENDIX

## TROUBLESHOOTING

| Trouble | Possible Cause | Remedy |
|---|---|---|
| **Meter indicates higher than actual rate** | Incorrect K-factor entry | Correct K-factor |
| | Debris on rotor support. | Clean meter |
| | Build up of foreign material on meter bore | Clean meter |
| **Meter indicates lower than actual flow rate** | Incorrect K-factor entry | Correct K-factor |
| | Wrong Magnetic Pickup | Use only B111113 Pickup |
| | Incorrect or missing pressure and/or temperature entries | Correct pressure and/or temperature entries |
| | Debris on rotor. | Clean meter and add filter |
| | Worn bearing | Replace rotor and add filter |
| **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 |
| **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** | Rotor not turning | Clean rotor or replace rotor cartridge |
| | Faulty pick-up | Replace pick-up |
| | Broken wire in cable between flow sensor and receiving electronics | Repair or replace cable |
| **System works perfect, except indicates lower flow over entire range** | Bypass flow, leak | Repair or replace bypass valves, or faulty solenoid valves |

***TABLE 1 - TROUBLESHOOTING***

## NOMINAL K-FACTOR VALUES

| Gas | | |
|---|---|---|
| **Meter** | **Flow Range** | **Nominal K-factor** |
| Low | 7-70 ACFM (10-100 MCFD) | 365 |
| Medium | 14-210 ACFM (20-300 MCFD) | 190 |
| High | 35-350 ACFM (50-500 MCFD) | 85 |

***TABLE A2 - GAS K-FACTORS***

## REPLACING TURBINE CARTRIDGES

If a turbine is damaged and it becomes necessary to service the meter repairs are easily accomplished in the field using slide-in replacement cartridges.

Cartridge replacement kits come complete with the turbine cartridge and two retaining rings.

| Size | Part Number |
|---|---|
| Low Flow Cartridge | B142-20L-Kit |
| Mid Flow Cartridge | B142-20M-Kit |
| High Flow Cartridge | B142-20H-Kit |

## REPLACEMENT PROCEDURE

1) Using a knife edge or small flat bladed screwdriver remove both retaining rings. With the retaining rings absent the old turbine cartridge should be easily removed.
2) Clean any foreign materials from the bore of the meter body that may restrict sliding the new turbine cartridge into place.
3) Replace the downstream retaining ring with one of the new retaining rings supplied in the kit.
4) With the meter body on a flat surface downstream end facing down the direction arrow on the outside of the meter body should also be facing down. Place the turbine cartridge at the opening of the meter body with the arrow on the turbine cartridge facing the same direction as the arrow on the meter body.
5) Rotate the turbine cartridge so that the gap in the cartridge lines up with the magnetic pickup then squeeze the cartridge to reduce the gap until the cartridge slides into the meter body.

***NOTE:*** *In a properly aligned cartridge the pressure port at the bottom of the meter body will also line up with the round hole at the bottom of the turbine cartridge.*

6) Install the inlet retaining ring.

## GAS COMPENSATION CONSIDERATIONS

Gaseous fluids measured by the B142 gas turbine meter are compressible, and is also affected by temperature changes as illustrated by the ideal gas law equation (***Equation 1***):

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

**Equation 1**

This equation allows the calculation of gas volumes when the pressure and/or temperature values vary from standard conditions. Standard conditions are generally assumed to be 0 psig and 60 °F.

Because pressure and temperature have a large impact on the mass of gas moving through the flow meter both values must be entered into the receiving electronics for accurate gas readings to occur.

## ABSOLUTE PRESSURE AND TEMPERATURE

The ideal gas law equation shows that the volume of gas is determined by the specific pressure and temperature applied to the gas under running conditions.

In this equation, the pressure (**P**) is absolute pressure, that is the observed gauge pressure plus the atmospheric pressure. The commonly used domestic unit of measure for absolute pressure is pounds per square inch absolute (psia). Atmospheric pressure is considered to be 14.73 psi. Therefore, Absolute pressure (psia) is the sum of the gage pressure plus 14.73.

Absolute Pressure = Gage Pressure (pisg) + 14.73

The absolute temperature in the equation (**T**) is expressed in degrees Rankine, which is calculated by adding 459.67 to the temperature in F°.

Absolute Temperature = Observed Temperature (°F) + 459.67

## EFFECTS OF CHANGING PRESSURES

For applications where the pressure does not remain constant and "Standard" units of measure must be determined, the degree to which changing pressures affect readings must be known. Relatively small changes in pressure can produce large errors in the calculation of standard volumes, especially at low ambient temperatures.

***NOTE:*** *The effect of changing pressure is much greater than the effect of changing temperature. The overall effect of changing temperature and pressure is the algebraic sum of the individual effects.*

## EFFECTS OF CHANGING TEMPERATURES

For applications where the temperature does not remain constant it may be desirable to compensate

for large fluctuations in temperature. In many applications, temperature changes will not produce serious measurement errors and can be disregarded. In situations where temperature changes are more extreme, for example seasonal temperature changes from winter to summer, reading accuracy can be adversely affected if the measurement isn't adjusted for temperature effects.

## FIXED PRESSURE AND TEMPERATURE CONVERSIONS

Generally, gas volumes are reported in standard cubic feet but are measured in actual cubic feet.

***NOTE:*** *standard cubic feet and actual cubic feet are equivalent for gases at standard conditions of 0 psi and 60°F.*

Simple conversions between Actual and Standard measurements are easy if the system pressure and temperature are known. The general conversion formulas are:

$$\text{Standard Cubic Feet} = \frac{\text{Actual Cubic Feet} \times P_a \times T_s}{P_s \times T_a}$$

$$\text{Actual Cubic Feet} = \frac{\text{Standard Cubic Feet} \times P_s \times T_a}{P_a \times T_s}$$

Where:

$\mathbf{P_a}$ = system pressure in psia (14.73 + gage pressure)
$\mathbf{P_s}$ = standard pressure in psia
$\mathbf{T_a}$ = system temperature in °R (system temperature in °F + 459.67)
$\mathbf{T_s}$ = standard temperature in °R (standard temperature in °F + 459.67) = 519.76 °R

**Example 1:**

One actual cubic foot at a pressure of 90 psig and 85 °F is equivalent to how many standard cubic feet?

$$\text{Standard Cubic Feet} = \frac{1 \times (90+14.73) \times 519.67}{14.73 \times (85 + 459.67)} = \frac{104.73 \times 519.67}{14.73 \times 544.67} = \frac{54{,}425}{8{,}023} = 6.784$$

This example shows that there are 6.784 standard cubic feet of gas in 1 actual cubic foot of gas at a running pressure of 90 psig and 85 °F.

## K-FACTOR CALCULATION IN STANDARD CUBIC FEET

If the running conditions are held constant, the K-factor adjustment for converting actual cubic feet to standard cubic feet will also remain constant. In applications where a direct readout in standard cubic feet is desirable the following formula can be used to determine the K-factor for any given set of operating conditions:

$$\text{Adjusted K-factor} = \frac{\text{Factory K-factor} \times P_s \times T_a}{P_a \times T_r}$$

**Example 2:**

A 2" B142 gas turbine meter has a factory K-factor of 190 pulses per actual cubic foot, and is installed in an application operating at 100 psig at 80 °F. Calculate the adjusted K-factor that will allow the downstream electronics to display flow in standard cubic feet.

Where:

**Factory K-factor =** the K-factor from the factory supplied in pulses per acf (actual $ft^3$).
$\mathbf{P_a}$ = system pressure in psia (14.73 + gage pressure)
$\mathbf{P_s}$ = standard pressure in psia
$\mathbf{T_a}$ = system temperature in °R (system temperature in °F + 459.67)
$\mathbf{T_s}$ = standard temperature in °R (standard temperature in °F + 459.67) = 519.76 °R

$$\text{Adjusted K-factor} = \frac{190 \times 14.73 \times (80 + 459.67)}{(100 + 14.73) \times (60 + 459.67)} = \frac{190 \times 14.73 \times 539.67}{114.73 \times 519.67} = \frac{1{,}510{,}375}{59{,}622} = 25.333$$

***NOTE:*** *If Blancett readout such as the B3000 is being used entering the Operating Pressure (Op Pres and Operating Temperature (Op Temp) will allow the readout to calculate the adjusted K-factor automatically eliminating the need to do manual conversions.*

In this example as long as the pressure and temperature stay at 100 psig and 80 °F a K-factor of 25.33 will allow the downstream electronics to display rate and total in scfm.

## DYNAMIC SYSTEMS

In systems where pressure and/or temperature vary constantly the only alternative to extracting scf from acf data is the use of a flow computer and discrete pressure and temperature transducers.

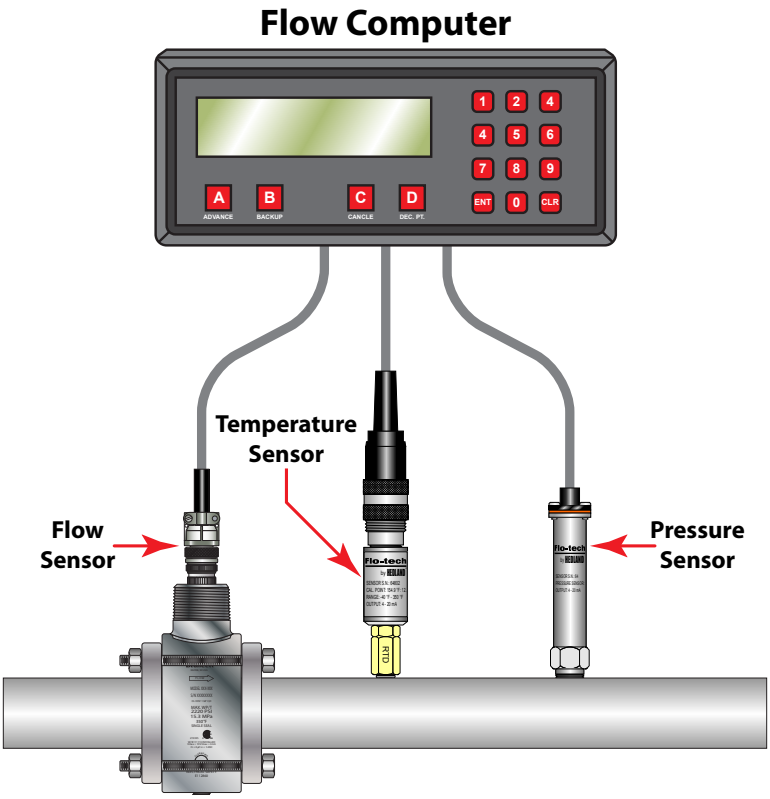


***FIGURE 10 - TYPICAL FLOW COMPUTER INPUTS***

# SYMBOL EXPLANATIONS

**Caution—Refer to accompanying documents.**

**WARNING:**
**EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.**

**AVERTISSMENT:**
**RISQUE D'EXPLOSION - LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.**

**WARNING:**
**DO NOT CONNECT OR DISCONNECT EITHER POWER OR OUTPUTS UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.**

**AVERTISSMENT:**
**RISQUE D'EXPLOSION. NE PAS DÉBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.**

**IMPORTANT NOTE:**
**Not following instructions properly may impair safety of equipment and/or personnel.**

| ELECTRICAL SYMBOLS | | | | | |
|---|---|---|---|---|---|
| **Function** | Direct Current | Alternating Current | Earth (Ground) | Protective Ground | Chassis Ground |
| **Symbol** |  |  |  |  |  |

CSA INTERNATIONAL

# Certificate of Compliance

| | | | |
|---|---|---|---|
| **Certificate:** | **1667574** | **Master Contract:** | **215035** |
| **Project:** | **2428682** | **Date Issued:** | **July 19,2011** |
| **Issued to:** | **Racine Federated Inc.** | | |

**8635 Washington Ave**
**Racine, WI 53406**
**USA**
**Attention: William Roeber**

***The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.***

C US

*Edward Foo*

**Issued by: Edward Foo, C.E.T.**

**PRODUCTS**

**CLASS 2258 04 - PROCESS CONTROL EQUIPMENT -Intrinsically Safe, Entity -For Hazardous Locations**

**CLASS 2258 84 - PROCESS CONTROL EQUIPMENT -Intrinsically Safe, Entity --For Hazardous Locations -Certified to US Standards**

**Class I, Div. 1, Groups C and D; Class II, Div. 1, Groups E, F and G:**

• Model 280605, Battery Powered B2800 Series Flow Monitor. Intrinsically safe when installed per Drawing NO.B280001 and using Duraeell 1.5 V D-cell (p/n MN 1300) or Energizer 1.5 V (p/n E95). Opto-isolated entity parameters are Vmax = 30 V, Imax = 100 mA, Ci = 0 µF, Li = O. Output to Turbine Flow Meter having Entity Parameters of Voc = 3.5V ; Isc = 1.8mA ; Ca = 15µF ; La = 1.65H. Temperature code T3C at maximum Ambient 70 °C. Enclosure Type 4X.

• Model B280606, Loop Powered B2800 Series Flow Monitor. Intrinsically Safe when installed per Drawing No. B280002. Opto-isolated entity parameters are Vmax = 30 V, Imax = 100 mA, Ci = 0.0 µF, Li = 0. 4-20 rnA Current loop entity parameters are Vmax = 30 V, Imax = 100 mA, Ci = 0.5 µF, Li = O. Output to Turbine Flow Meter having Entity Parameters of Voe = 3.5V ; Isc = 1.8mA ; Ca = 15µF ; La = 1.65H. Temperature code T3C at maximum Ambient 70°C. Enclosure Type 4X.

CSA INTERNATIONAL

| | | | |
|---|---|---|---|
| **Certificate:** | **1667574** | **Master Contract:** | **215035** |
| **Project:** | **2428682** | **Date Issued:** | **July 19,2011** |

• Turbine Flow Meter, Models BII00 and Bl30 QuikSert, Intrinsically Safe with Entity Parameters Vmax = l0V, Imax = 7mA, Ci = 0µF, Li = 0.9H. “Single Seal”, MWP 5000 PSI (34.5MPa), 350°F.

• Gas Turbine Flow Meter, Model Bl42 Series, Intrinsically Safe with Entity Parameters Vmax = l0V, Imax = 3mA, Ci = 0µF, Li = 1.65H. “Single Seal”, MWP 5000 PSI (34.5MPa), 350°F.

APPLICABLE REQUIREMENTS

CAN/CSA C22.2 No. 0-M91 (R2001) - General Requirements - Canadian Electrical Code, Part II

CSA C22.2 No. 142 - Ml987 - Process Control Equipment

CSA-C22.2 No. 157-92 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

CSA-C22.2 No. 94-M91 - Special Purpose Enclosures

UL Std No. 913 -7th Ed. - Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous Locations

UL No. 50 - 12th Ed. - Enclosures for Electrical Equipment, Non-Environmental Considerations

UL No. 50E - 1st Ed. - Enclosures for Electrical Equipment, Environmental Considerations

UL No. 746C - 6th Ed. - Polymeric Materials - Use in Electrical Equipment Evaluations

ANSI/ISA-12.27.01-2003 - Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids

CSA INTERNATIONAL

# *Supplement to Certificate of Compliance*

**Certificate:** **1667574** **Master Contract:** **215035**

***The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate***

Product Certification History

| Project | Date | Description |
|---|---|---|
| 2428682 | July 19, 2011 | Update to include alternative Gas Turbine Flow Meter, Model B142 Series. |
| 2388024 | March 15, 2011 | Update to cover Turbine Flow Meters Entity Certification. |
| 2392258 | February 16, 2011 | Update to report 1667574 to include additional private label. |
| 2302190 | July 30, 2010 | Update to include "Single Seal Device" Marking. |
| 2284108 | March 26, 2010 | Update to Report 1667574 to include an alternate Battery Holder and Battery Bracket assembly. |
| 2131250 | March 31, 2009 | Update of report to add humidity vent and revise model code scheme (including multiple listing). |
| 1921676 | July 19, 2007 | Update Report 1667574 for alternate construction. |
| 1667574 | October 4, 2005 | 1. Transfer Contents of MC 185535 (Legacy 105056) to MC 215035 & cancel MC 185535 (Legacy 105056); |

**History**

1439967 2003/10/08 Original certification of Model B2800 Flow Monitor (battery and loop powered) as intrinsically safe for Class I, Groups C, D; Class II, Groups E, F, G.

## CONTACTS AND PROCEDURES

### CUSTOMER SERVICE/APPLICATION ENGINEER:

If you have a question regarding order status, placing an order, reviewing applications for future purchases, or wish to purchase a new flow meter, please contact our national sales and marketing headquarters:

**BLANCETT**
Division of Racine Federated Inc.
8635 Washington Avenue
Racine, WI 53406
PHONE: 800-235-1638 or 262-639-6770
FAX: 262-639-2267

## SERVICE/REPAIR DEPARTMENT:

If you already purchased equipment and have an operation problem, require service, or need to schedule field service, please contact our service department:

**BLANCETT**
Division of Racine Federated Inc.
8635 Washington Avenue
Racine, WI 53406
PHONE: 800-235-1638 or 262-639-6770
FAX: 262-639-2267

## RETURN GOODS AUTHORIZATION:

When returning equipment, it is necessary to contact our service department at 800-235-1638 or 262- 639-6770 to obtain an RGA number for the authority and proper tracking of your material and its prompt inspection and return. The RGA number should be noted on the outside of the box. All returns of equipment go to the following address:

**BLANCETT**
Division of Racine Federated Inc.
8635 Washington Avenue
Racine, WI 53406
Attn: RGA #

# LIMITED WARRANTY AND DISCLAIMER

Racine Federated Inc. warrants to the end purchaser, for a period of one year from the date of shipment from the factory, that all new 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 misapplication, abuse, lack of maintenance, modified or improper installation. Racine Federated Inc.'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 Racine Federated Inc. and found to be defective. Repair or replacement is at Racine Federated Inc.'s discretion. An authorization number must be obtained from Racine Federated Inc. 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 assume all risks in connection therewith. Racine Federated Inc. assumes no responsibility or liability for any omissions or errors in connection with the use of its products. Racine Federated Inc. 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 Racine Federated Inc.

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.

**8635 Washington Avenue • Racine, Wisconsin 53406**
**Toll Free: 800.235.1638**
**Phone: 262.639.6770 • Fax: 262.417.1155**
**www.blancett.com • info@blancett.com**

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