

## 3" BiRotor, APL Models B171, B173, B174, B175

### Description

The BiRotor Meter is a positive displacement meter utilized in the most demanding applications requiring accuracy, long life and ruggedness. The electronic "P" Series meter configuration features a sealed measuring chamber with one reluctance type electronic sensor. The sealed electronic sensor transmits amplified signals to local or remote instruments. A second optional sensor is available to allow dual channel pulses that are 90 degrees electrically out of phase.

**Accuracy** is attained by the unique BiRotor design which features two finely balanced rotors. An adjustor, incorporated on the meter, is used to assure maximum accuracy within the meter's flow range (Mechanical Only).

**Long Life** is assured because the meter does not contain any oscillating, reciprocating, sliding parts or cranks to wear or disturb the balanced rotary action. In addition, the materials incorporated within the meter assembly are selected specifically for a wide range of petroleum and industrial liquid applications.

### Electrical Classification (P-Style)

Class 1, Groups C & D, Division 1, Explosion proof; Recommended connecting cables Belden 8770, 3 Conductor Shielded, 18 gauge stranded. Maximum recommended cable length 3000 feet (914 meters). Input power: 6-28 Vdc at 20 mA, Output Signal: TTL (0-5V) or voltage dependent.

### Principle of Operation

Two spiral fluted rotors within the measuring unit are dynamically balanced to minimize bearing wear. (Refer to Figure 1). As the product enters the intake of the measuring unit, the two rotors divide the product into precise segments of volume momentarily and then return these segments to the outlet of the measuring unit. During this "liquid transition", the rotation of the two rotors is directly proportional to the flow rate of the liquid thruput. A gear train located outside the measuring unit chamber conveys mechanical rotation

### Flow Capacity

525 GPM  
1,987 LPM  
750 BPH



### WARNING

**Do NOT operate this instrument in excess of the specifications listed. Failure to heed this warning could result in serious injury and/or damage to the equipment.**

of the rotors to a mechanical or electronic register for totalization of liquid thruput. For P-Style units, a pulse verification gear located outside the measuring unit chamber conveys mechanical rotation of the rotors to the sensor and to the electronic register for totalization of liquid thruput.

### Design Features

- Extremely long service life
- Economical low maintenance
- Two simple rotors with no metal-to-metal contact are the only moving parts in the measuring chamber.
- No oscillating, reciprocating or sliding parts or cranks to wear or disturb the balanced rotary action.
- Conforms with International standards of flowmeter accuracy.

### Accessories (Mechanical)

- Preset Counters
- Control Valves
- Large Numerical Registers
- Pulse Transmitters
- Ticket Printers
- Strainers

### Accessories (P-Style)

- Electronic Register
- Preamp
- Dual Pickoffs for "B" Level Pulse Security

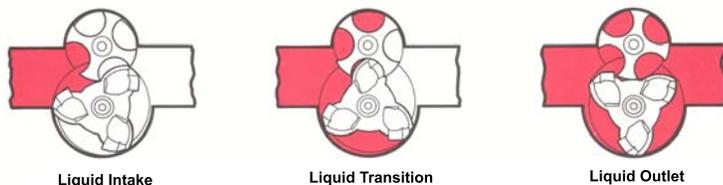


Figure 1: Brodie BiRotor Meter Principle of Operation

## Materials of Construction

**Housing:** Welded Steel Construction Combining  
Steel Castings and Drawn Steel Plate

### Measuring Unit:

**Rotors:** Three Lobe Rotor - Cast Iron  
Four Fluted Rotor - Aluminum

**Rotor Shafts:** E.T.D. 150

**Rotor Bearings:** Stainless Steel

**Body and End Covers:** Cast Iron

### Counter Base Plate:

**Body:** Steel

**O-Ring:** Viton (Standard)

**Drive Shafts, Drive Gears, and Ball Bearings:**  
Stainless Steel

## Accuracy:

Capable of +/- 0.15%; Contact Factory for viscosity corrections.

## Flange Connections

Model	Connections	Max Working Pressure @100F	DIN Connections	Max Working Pressure
B171	3" 150 lb. ANSI	285 PSI	DN 80 PN 16	16 Bar
			DN 80 PN 40	19.6 Bar
B173	3" 300 lb. ANSI	300 PSI	DN 80 PN 40	20.7 Bar
B174	3" 300 lb. ANSI	740 PSI	DN 80 PN 40	40 Bar
			DN 80 PN 64	51 Bar
B175	3" 600 lb. ANSI	1480 PSI	DN 80 PN 64	64 Bar
			DN 80 PN 100	100 bar

**Temperature Range:** -20°F to 150° (-29°C to 66°) Optional 325°F (163°C)

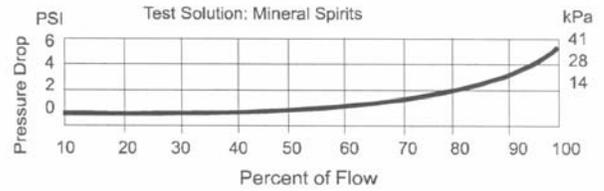
## Flow Capacity

Meter Models B171, B173, B174, B175		
	Maximum Flow	Minimum Flow
<b>GPM</b>	525	105
<b>LPM</b>	1987	397
<b>BPH</b>	750	150

## For Certified Dimensional Prints - Consult Factory

Shipping Weight and Volume (Approximate)	
B171	297 lbs. @ 11 Cu. Feet 135 kgs. @ .31 Cu. Meters
B173	305 lbs. @ 11 Cu. Feet 138 kgs. @ .31 Cu. Meters
B174	455 lbs. @ 12 Cu. Feet 206 kgs. @ .34 Cu. Meters
B175	565 lbs. @ 13 Cu. Feet 256 kgs. @ .37 Cu. Meters

## Typical Pressure Drop Curve



## Ordering Information

In order to accurately process an order, such information as product to be metered, product viscosity, product temperature range, ambient temperature range, rate of flow, operating pressure, units of registration, accessories required, and optional features needed must be specified by the customer.

## K-Factor/Pulses (P-Style)

Electronic Pulses (K-Factor)	Gallons	Liters	BBL
	100	26.4	4,200

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