

## Technical Data

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### BiRotor, APL

Model B190	[6"]
Model B191	[6"]
Model B193	[6"]
Model B194	[6"]
Model B195	[6"]



#### General

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

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

#### Long Life

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. 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 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

- Double case design
- Extremely long service life
- Economical Low maintenance
- Two simple rotors with no metal-to-metal contact
- No oscillating, reciprocating or sliding parts or cranks to wear or disturb the balanced rotary action
- Sustained Measurement Accuracy
- 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

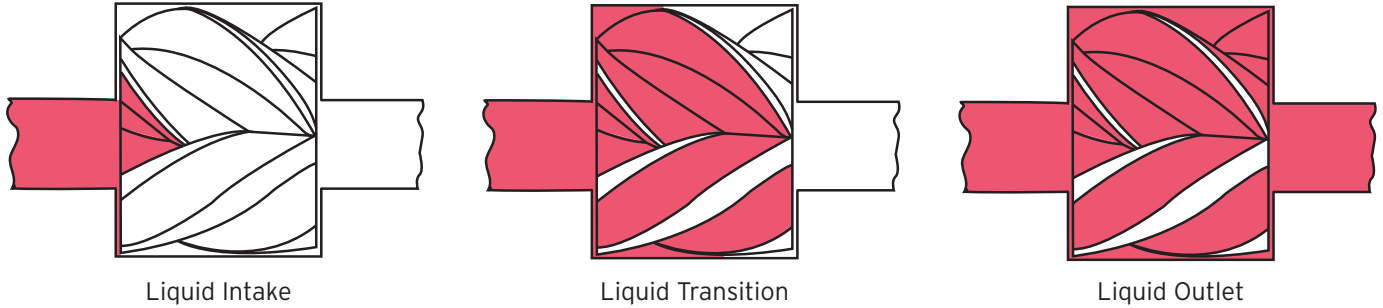


Figure 1- Brodie BiRotor Meter Principle of Operation

### 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 +/- 0.10%; Contact Factory for viscosity corrections.

Electronic Pulses (K-Factor)	Gallons	Liters	BBL
	29	7.6	1,218

### Shipping Weight And Volume (Approximate)

B190, B191	725 lbs. @ 24 Cu. Feet
	329 kgs. @ 0.68 Cu. Meters
B193	835 lbs. @ 29 Cu. Feet
	379 kgs. @ 0.82 Cu. Meters
B194	1,415 lbs. @ 34 Cu. Feet
	642 kgs. @ 0.96 Cu. Meters
B195	1,510 lbs. @ 39 Cu. Feet
	685 kgs. @ 3.85 Cu. Meters

### 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.

### Flange Connections

Models	Connections	Max Working Pressures @100F	DIN Connections	Max working pressure
B190	6" 150 lb. ANSI	150 psi	DN 150 PN 16	10.3 Bar
B191	6" 150 lb. ANSI	285 psi	DN 150 PN 16	16 Bar
			DN 150 PN 40	19.6 Bar
B193	6" 300 lb. ANSI	300 psi	DN 150 PN 40	20.7 Bar
B194	6" 300 lb. ANSI	740 psi	DN 150 PN 40	40 Bar
			DN 150 PN 64	51 Bar
B195	6" 600 lb. ANSI	1480 psi	DN 150 PN 64	64 Bar
			DN 150 PN 100	100 Bar

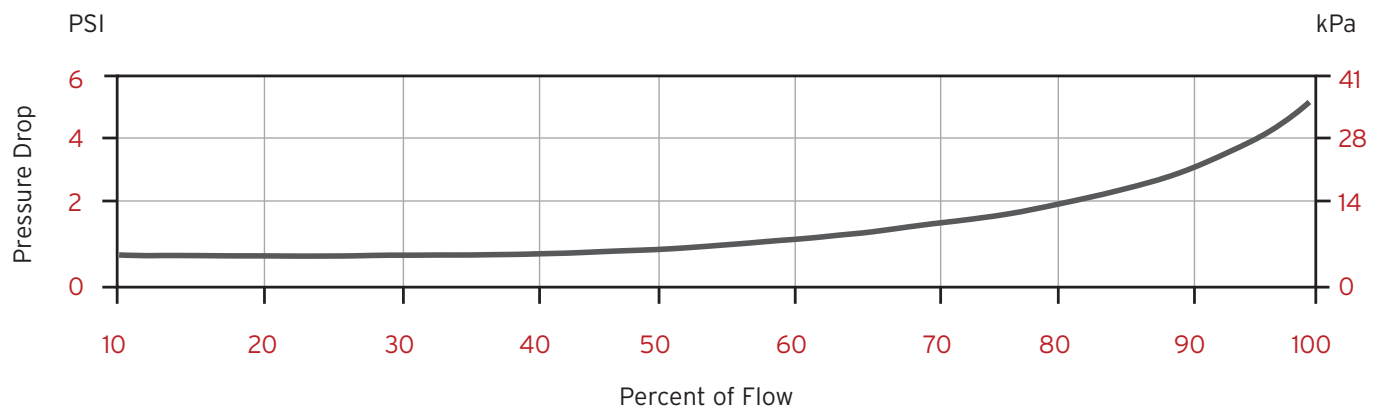
Temperature Range: -20°F to 150°F (-29°C to 66°C) Optional 450°F (232°C)

### Typical Flow Rates

Meter Models B190, B191, B193, B194, B195	10 cP		100 cP		300 cP		500 cP	
	Accuracy		Accuracy		Accuracy		Accuracy	
	+/- 0.25%		+/- 0.20%		+/- 0.15%		+/- 0.15%	
	Min	Max	Min	Max	Min	Max	Min	Max
GPM	240	1,200	170	1,200	120	1,200	120	1,200
BPH	342	1714	243	1714	171	1714	171	1714
M <sup>3</sup> H	54	272	39	272	27	272	27	272

### Typical Pressure Drop Curve

Test Solution: Mineral Spirits



**NOTE:**

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.

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