

## APL BIROTOR MODELS B231, B233, B234, B235

### DESCRIPTION

The APL (Automatic Pressure Lubricated) BiRotor Meter is a positive displacement flowmeter designed to measure low lubricity fluids such as butane, propane, natural gasoline or fluids with entrained abrasive solids such as crude oil. A sealed lubricating system isolates all bearings and gears from the process stream and provides long service life. The APL BiRotor is available in either Mechanical or Electronic ("P" Series) output configurations.

#### Mechanical

The mechanical output meter incorporates a sealed output shaft and a mechanical accuracy adjuster with provisions for mounting electro-mechanical accessories for control, batching, totalizing, and printing.

#### Electronic

The electronic "P" Series meter configuration features a sealed measuring chamber with one (standard) or two (optional) reluctance type electronic pulse outputs proportional to flow. The sealed electronic sensor(s) transmit amplified signals to local or remote instruments. The dual channel pulses are 90 degrees electrically out-of-phase.

Electrical classification: UL/CSA: Class 1, Groups C & D, Division 1, Explosion proof; CENELEC: EEx d II C T6. 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.

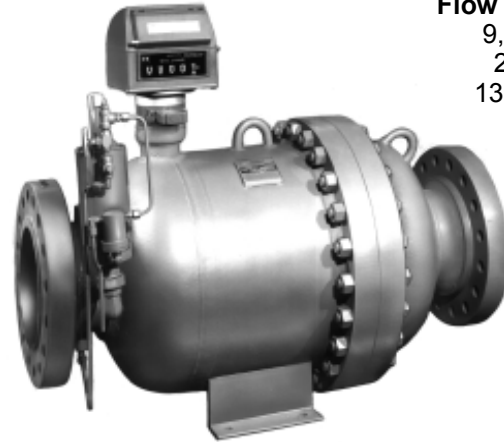
### DESIGN FEATURES

- Sealed lubrication system for abrasive fluid applications.
- Double case design
- Extremely long service life, low maintenance
- Two simple rotors with no metal-to-metal contact
- Sustained measurement accuracy
- Conforms with International standards for flowmeter accuracy.

### FLANGE CONNECTIONS

MODEL	ANSI Connections	MAXIMUM WORKING PRESSURE @ 100°F	DIN Connections	MAXIMUM WORKING PRESSURE
B231	16" 150 lb. ANSI	285 PSI	DN 400 PN 16 DN 400 PN 25	16 Bar 19.6 Bar
B233	16" 300 lb. ANSI	300 PSI	DN 400 PN 25	20.7 Bar
B234	16" 300 lb. ANSI	740 PSI	DN 400 PN 25 DN 400 PN 40 DN 400 PN 64	25 Bar 40 Bar 51 Bar
B235	16" 600 lb. ANSI	900 PSI	DN 400 PN64 DN 400 PN 100	62 Bar 62 Bar

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



**Flow Capacity**  
9,100 GPM  
2,066 M<sup>3</sup>H  
13,000 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.**

### 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** - Ductile Iron

**Rotor Bearings** - Stainless Steel

**Body and End Covers** - Cast Iron

#### Counter Base Plate:

**Body** - Steel

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

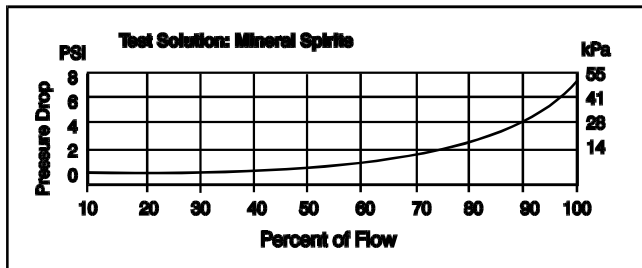
**Drive Shafts, Drive Gears and Ball Bearings** - Stainless Steel



### TYPICAL MINIMUM FLOW RATES

Meter Models	Viscosity								
	1.25 cSt.		6.25 cSt.		25 cSt.		125 cSt.		
	Accuracy		Accuracy		Accuracy		Accuracy		
B231, B233									
B234, B235									
Maximum Flow Rate	Minimum Flow Rates								
GPM	9100	1820	1400	1550	1200	1200	910	910	C/F
M <sup>3</sup> H	2066	413	318	352	272	272	207	206	C/F
BPH	13000	2600	2000	2214	1714	1714	1300	1300	C/F

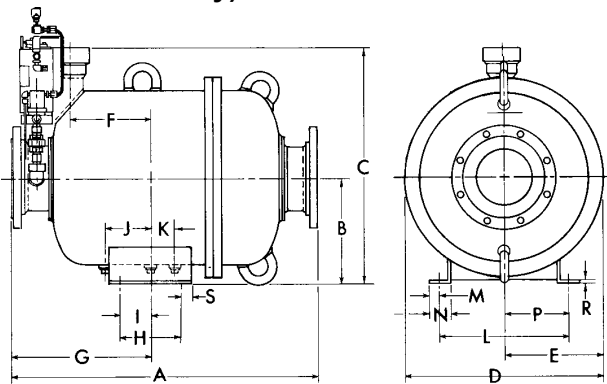
### TYPICAL PRESSURE DROP CURVE



### SHIPPING WEIGHT & VOLUME (APPROX.)

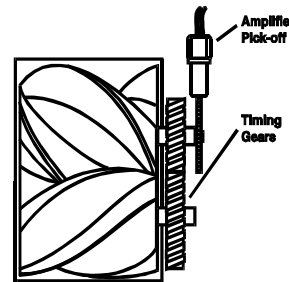
- B231 - 8,500 lbs. @ 136 Cu. Feet  
3,855 kgs. @ 3.85 Cu. Meters
- B233 - 8,650 lbs. @ 136 Cu. Feet  
3,923 kgs. @ 3.84 Cu. Meters
- B234 - 8,900 lbs. @ 136 Cu. Feet  
4,036 kgs. @ 3.84 Cu. Meters
- B235 - 9,000 lbs. @ 136 Cu. Feet  
4,090 kgs. @ 3.84 Cu. Meters

### DIMENSIONS (For Certified Dimension Prints - Consult Factory)



### K-FACTOR/PULSES ("P" Series)

Electronic Pulses (K-Factor)	Gallons	Cubic Meters	BBL
	--	--	1,101



Meter Mode	Flange Size	mm Inches	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S	Mounting Holes and Drain
B231	16" 150 lb.	mm Inches	1880 74	711 28	1480 58 1/4	1372 54	68 27	425 16 3/4	813 32	483 19	241 9 1/2	---	---	603 23 3/4	41 1 5/8	10 4	302 11 7/8	13 1/2	25 1	(4) DIA. 29 mm / 1-18" Mounting Holes 2"-11-1/2" NPT Drain Located rt. of center line
B233	16" 300 lb.	mm Inches	1918 75 1/2	711 28	1480 58 1/4	1372 54	68 27	425 16 3/4	832 32 3/4	483 19	241 9 1/2	---	---	603 23 3/4	41 1 5/8	10 4	302 11 7/8	13 1/2	25 1	
B234	16" 300 lb.	mm Inches	1981 78	711 28	1480 58 1/4	1372 54	68 27	425 16 3/4	864 34	483 19	241 9 1/2	---	---	603 23 3/4	41 1 5/8	10 4	302 11 7/8	13 1/2	25 1	
B235	16" 600 lb.	mm Inches	1981 78	711 28	1480 58 1/4	1372 54	68 27	425 16 3/4	864 34	483 19	241 9 1/2	---	---	603 23 3/4	41 1 5/8	10 4	302 11 7/8	13 1/2	25 1	

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.



Daniel Division Headquarters - Houston, Texas, USA, Tel: (713) 467-6000, Fax: (713) 827-3880

USA Toll Free 1-888-FLOW-001

Calgary, Alberta, Canada, Tel: (403) 279-1879, Fax: (403) 236-1337

Stirling, Scotland - UK, Mid-East & Africa, Tel: +44 1653-638300, Fax: +44 1653-600425

Singapore - Asia Pacific Tel: +65-777-8211, Fax: +65-770-8001

Daniel is a wholly owned subsidiary of Emerson, and a division of Emerson Process Management.

[www.daniel.com](http://www.daniel.com)