Technical Data

BRODIE INTERNATIONAL

BiRotor Plus
Positive Displacement Meter

B27X [3″]
B28X [4″]
B29X [6″]

General
The BiRotor Plus is an extremely accurate dual cased flow measuring device. It produces via the use of non wetted pickoffs a high resolution signal which is directly proportional to the rate of liquid flow through the meter. These signals can be shaped by a simple internal pre-amplifier for transmission to ancillary equipment.

The BiRotor Plus Meter utilizes the exclusive BiRotor principle. There are no sliding, oscillating, or reciprocating parts.

Accuracy
The BiRotor Plus meter is the most accurate PD meter in the market. A linearity of 0.075% and a repeatability of 0.02% are better than any other meter in the industry.

Dependability
There is no metal to metal contact between the rotors and the measurement chamber. The meter is therefore extremely durable. The rotors are the only moving parts. Maintenance requirements are the lowest in the industry.

Affordability
In spite of its superior performance, Brodie can offer the BiRotor Plus at a very competitive price.

Flexibility
The BiRotor plus meter can be installed either vertically or horizontally. It offers direct pulse output. And it is field proven in thousands of installations.

Linearity
B27X Standard Rotors
+/- 0.1% Over Standard Flow Range
+/- 0.15% Over Extended Flow Range

B28X and B29X Standard Rotors
+/- 0.075% Over Standard Flow Range
+/- 0.15% Over Extended Flow Range

Repeatability
(All Sizes):
0.02% std. Rotors
0.04% X-Clearance
[Premium accuracy is also available]

Viscosity Range
Standard: 0.2 - 100 cSt
extra clearance rotor version: 100 - 400 cSt

Flow Ranges

Meter size		GPM		BPH		l/min		m3/h		Nominal K-Factor
		min	max	min	max	min	max	min	max	
DN80 3″	standard	43	425	61	607	163	1609	10	97	160 PUL/ GAL +/-10%
	extended	30	550	43	786	114	2082	7	125	
DN100 4″	standard	70	700	100	1000	265	2650	16	159	96 PUL/ GAL +/-10%
	extended	33	1000	47	1429	125	3785	7	227	
DN150 6″	standard	100	1000	143	1429	379	3785	23	227	96 PUL/ GAL +/-10%

Operating temperature limits

Meter type	Seal material	Minimum operating temp		Maximum operating temp	
		Degree F	Degree C	Degree F	Degree C
Low temp	Viton 1289	-40	-40	167	75
Low temp	Fluoro Silicon	-40	-40	167	75
Standard	Viton A	-15	-25	167	75
Standard	Low swell nitrile	-20	-29	167	75
Standard	Viton F	-15	-25	167	75
Standard	Fluoro Silicon	-20	-29	167	75
High temp	Viton A	14	-10	230	110
High temp	Low swell nitrile	14	-10	212	100
High temp	Viton F	14	-10	230	110
High temp	Fluoro Silicon	14	-10	230	110

Max Working Pressure [at 100 F, 38 C]

Flange Ratings	PSI	bar
ANSI 150#	285	19.5
ANSI 300#	740	51
DIN PN 16	232	16
DIN PN 40	580	40

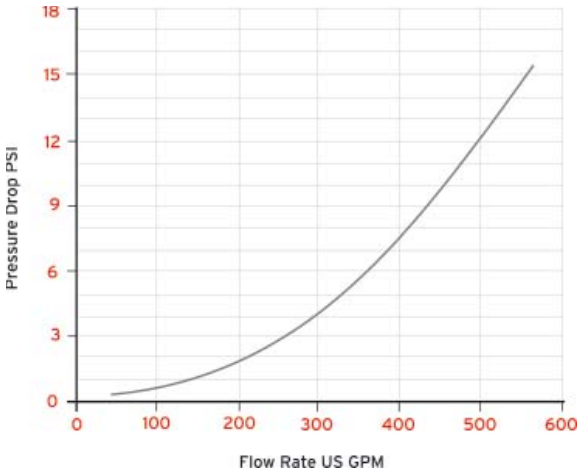
To convert pressure drop value to the actual process fluid, use the following equation:

Delta PA = (cPA)0.25 X (SGA)0.75 X Delta Pm

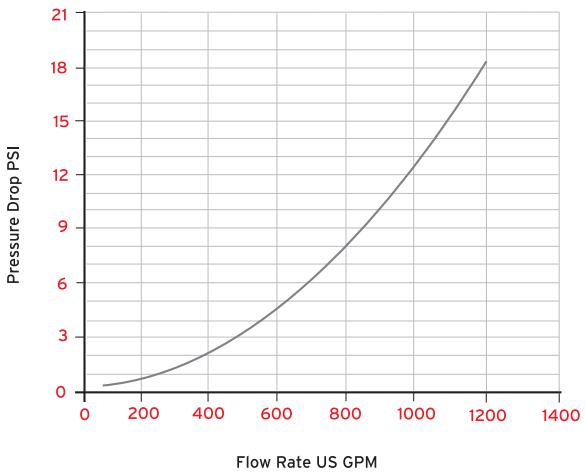
Delta PA = Pressure Drop on Actual Fluid in PSI
cPA = Viscosity of Actual Fluid in cP
SGA = Density of Actual Fluid in SG
Delta Pm = Pressure Drop on Mineral Spirits
(See Graphs 1 and 2 on Page 4 for Reference)

Pressure Drop

3" BiRotor Plus



4" and 6" BiRotor Plus



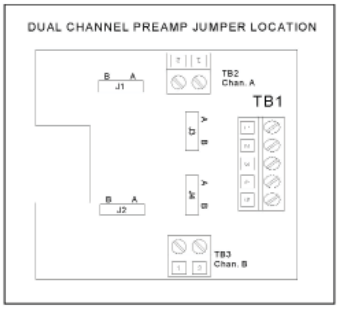
Preamplifier

Supply voltage: 9 to 28 VDC
Outputs (jumper selectable): square wave 0 to 5 KHz
5 V powered pulse: 0 – 5 VDC, 20 mA max

Variable voltage pulses: 0 to supply voltage less 5%
70 mA max

Open Collector: max voltage: 30 VDC
max current: 125 mA
max power: 0.5 W

Wiring Connections



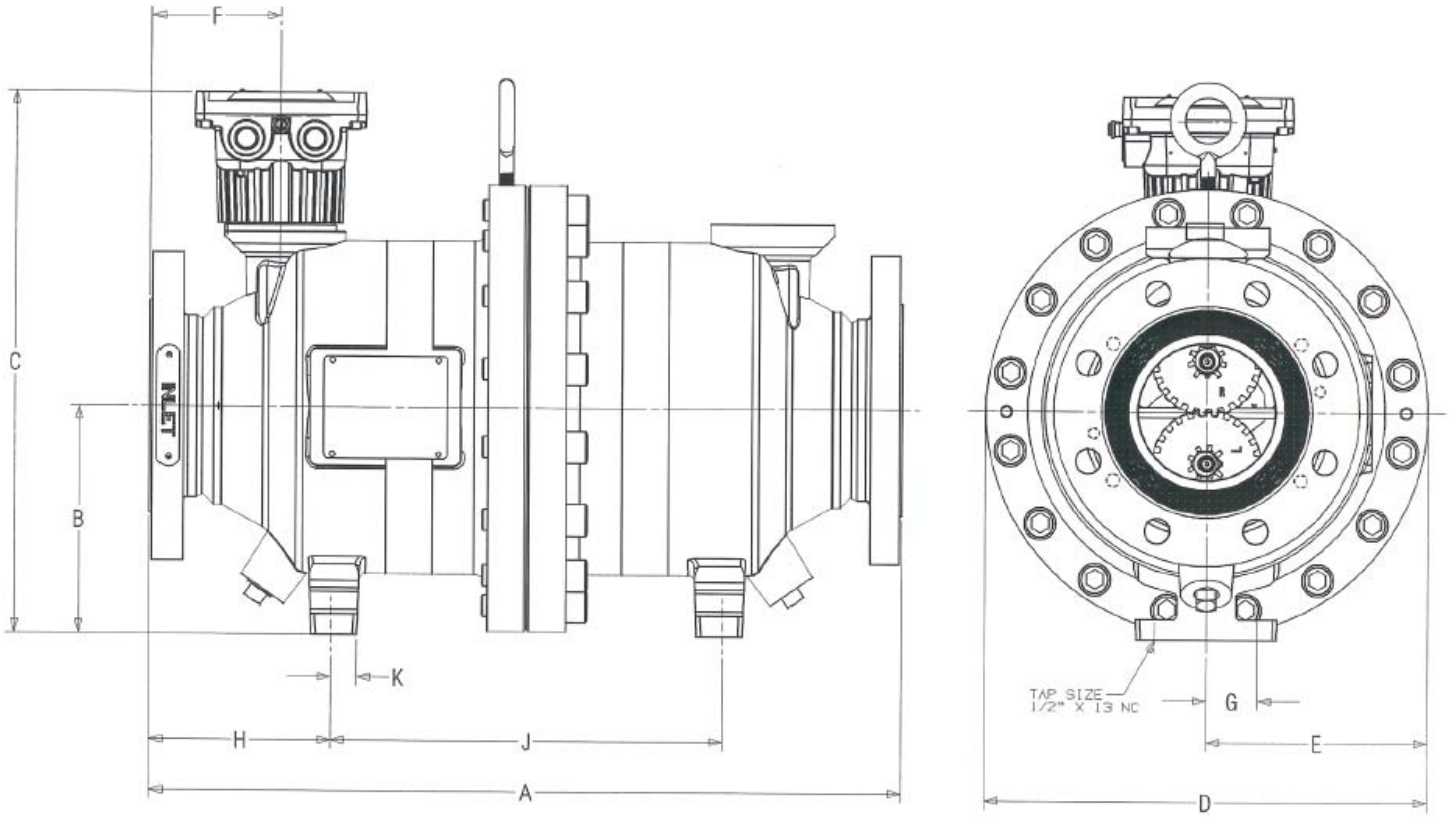
TB1

1 = V Supp 9-28 Vdc
2 = V Comm
3 = Channel A Signal
4 = Channel A & B Common
5 = Channel B Signal

Approvals

Environmental	Electromagnetic Emissions & Immunity	Hazardous Area	Weights and Measures	Pressure Equipment
NEMA 4X	CE European Union (EN 61326)	CSA (United States and Canada) Class 1, Division 1, Group C, and D Certificate: 2142875 221162 standard pick off: -4°F to 167°F, -20°C to 75°C hight temp pickoff: 14°F to 230°F, -10°C to 110°C	NTEP	Under the EU Pressure Equipment Directive 97/23/EC
Type 4X	OIML R117-1 Class E2	ATEX CE 0359 II 2 G Ex d IIB T6...T4 Certificate: ITS 08 ATEX 15842X standard pick-off: -20°F to 167°F, -29°C to 75°C high temp pickoff: -20°F to 230°F, -29°C to 110°C	Measurement Canada	Rated as SEP for ANSI 150# and PN 16 versions
IP 65	MID Class E2	GOST -20°F to 167°F, -29°C to 75°C	OIML	Rated as CAT 2 for 300# and PN40 versions,
OIML R117-1 Class H3	FCC 47 CFR Part 15	IEC Ex Ex d IIB T6 – T4 Gb Certificate: IEC Ex ITS 08.0021X standard pick-off: -20°F to 140°F, -29°C to 60°C high temp pickoff: -20°F to 230°F, -29°C to 110°C	MID	Canadian Registration: All Provinces
	ICES-003 Issue 4		GOST [3" and 4"]	
			China	
			Australia NMI	

Dimensions



Model	Size	Unit	A	B	C	D	E	G	H	J
B27X	3" ANSI 150#	inch	18	6 1/6	14 13/16	11 1/2	5 3/4	1 3/8	4 3/16	9 5/8
		mm	457	154	376	292	146	35	107	244
	DN80 PN 16	inch	18	6 1/16	14 13/16	11 1/2	5 3/4	1 3/8	4 3/16	9 5/8
		mm	457	154	376	292	146	35	107	244
	3" ANSI 300#	inch	19	6 1/16	14 13/16	11 1/2	5 3/4	1 3/8	4 11/16	9 5/8
		mm	483	154	376	292	146	35	119	244
	DN80 PN 40	inch	19	6 1/16	14 13/16	11 1/2	5 3/4	1 3/8	4 11/16	9 5/8
		mm	483	154	376	292	146	35	119	244
B28X	4" ANSI 150#	inch	22	6 5/8	16	13	6 1/2	1 1/2	5 1/4	11 1/2
		mm	559	168	406	330	165	38	133	292
	DN100 PN 16	inch	22	6 5/8	16	13	6 1/2	1 1/2	5 1/4	11 1/2
		mm	559	168	406	330	165	38	133	292
	4" ANSI 300#	inch	23 1/8	6 5/8	16	13	6 1/2	1 1/2	5 15/16	11 1/2
		mm	587	168	406	330	165	38	150	292
	DN100 PN 40	inch	23 1/8	6 5/8	16	13	6 1/2	1 1/2	5 15/16	11 1/2
		mm	587	168	406	330	165	38	150	292
B29X	6" ANSI 150#	inch	24	6 5/8	16	13	6 1/2	1 1/2	6 1/4	11 1/2
		mm	610	168	406	330	165	38	159	292
	DN150 PN 16	inch	24	6 5/8	16	13	6 1/2	1 1/2	6 1/4	11 1/2
		mm	610	168	406	330	165	38	159	292

Materials Housing

Meter Housing:	ASTM A 216 WCB ASTM A 516 GR 70
Connection Flanges:	ASTM A 105 Carbon Steel
Sensor Housing:	ASTM A 479 304 Stainless Steel

Materials Measuring Unit

End plates and body:	A 356 T6 Cast Aluminium
Rotors:	ALCO 319 Cast Aluminium Hard Coat anodized
Rotor shafts:	17-4 PH Stainless Steel
Timing gears 3":	17-4 PH Stainless Steel
Timing gears 4, 6":	17-4 PH Stainless Steel
Bearings:	Hybrid Ceramic
Elastomers:	Low swell Nitrile, Viton F®, or Fluoro Silicon are standard
UMB Housing:	A356 T6 Cast Aluminium [non wetted component]

Shipping weights and volume

Model	Size	Unit	Weight
B 27 X	3" ANSI 150# DN80 PN16	lb	193
		kg	88
	3" ANSI 300# DN80 PN 40	lb	200
		kg	91
B 28 X	4" ANSI 150# DN100 PN16	lb	293
		kg	133
	4" ANSI 300# DN100 PN40	lb	300
		kg	136
B 29 X	6" ANSI 150# DN150 PN 16	lb	350
		kg	159

Brodie International

P.O. Box 450 (30459-0450)
19267 Highway 301 North
Statesboro, GA 30461
USA

Phone: +1 (912) 489-0200
Fax: +1 (912) 489-0294