



BiRotor Plus Models B27X, B28X, B29X

Description

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.

Materials of Construction

Meter Housing: ASTM A 216 WCB
 ASTM A 516 GR 70
 ASTM A 105
 Carbon Steel

Sensor Housing: ASTM A 479
 304 Stainless Steel

Measuring Unit Components

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: 416 Stainless Steel

Bearings: Stainless Steel (Ceramic
 Optional)

Elastomers: Viton A[®], Low swell Nitrile,
 Viton F[®], or Fluoro Silicon
 are standard
 (other options available)

UMB Housing*: A356 T6 Cast Aluminium

* This part is not wetted.

Electrical Details

Pick off:
 Non Wetted Reluctance Type
 Sine Wave Amplitude: 40 mV P-P, min.



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

Performance

B27X Linearity Standard Rotors

+/- 0.1% Over Standard Flow Range
 +/- 0.15% Over Extended Flow Range

B28X and B29X Linearity, Standard Rotors

+/- 0.075% Over Standard Flow Range
 +/- 0.15% Over Extended Flow Range

Premium accuracy is also available.

Repeatability (All Sizes): +/- 0.01%

Operating Temperatures Limits:
 Dependant on pick off type and O-Ring seals used, see Table 1.

Table 1: Operating Temperature Limits

Pick Off Type	Seal Material	Minimum Operating Temp		Maximum Operating Temp	
		Degree F	Degree C	Degree F	Degree C
Standard	Viton A	-15	-20	167	75
Standard	Low Swell Nitrile	-20	-29	167	75
Standard	Viton F	-15	-20	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

BiRotor Plus Approvals Environmental

Environmental

NEMA 4X
 Type 4X
 IP 65
 OIML R117-1 Class H3

Electromagnetic Emissions & Immunity

CE European Union (EN 61326)
 OIML R117-1 Class E2
 MID Class E2
 FCC 47 CFR Part 15
 ICES-003 Issue 4

Hazardous Area Approvals

Temp Ambient. -40 to 60°C, -40 to 140°F
 CSA (United States and Canada)
 Class 1, Division 1, Group C, and D
 Certificate: 2142875 221162
 ATEX

CE 0359  II 2 G Ex d IIB T6...T4
 Certificate: ITS 08 ATEX 15842X

IEC Ex

Ex d IIB T6 – T4 Gb
 Certificate: IEC Ex ITS 08.0021X

Weights and Measure

NTEP
 OIML R117-1
 The Peoples Republic of China
 Netherlands Weight and Measures
 Measurement Canada
 PTB Germany
 MID Certified as a component for use with in a measuring system as agreed within WELMEC
 GOST

Pressure Equipment

Under the EU Pressure Equipment Directive
 97/23/EC
 Rated as SEP for ANSI 150# and PN 16 versions
 Rated as CAT 2 for 300# and PN40 versions,
 Canadian Registration: All Provinces

Table 2: Maximum Working Pressure at 100 deg F, 38 deg 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:

$$\Delta P_A = (cP_A)^{0.25} \times (SG_A)^{0.75} \times \Delta P_m$$

ΔP_A = Pressure Drop on Actual Fluid in PSI

cP_A = Viscosity of Actual Fluid in cP

SG_A = Density of Actual Fluid in SG

ΔP_m = Pressure Drop on Mineral Spirits (See Graphs 1 and 2 on Page 4 for Reference)

Table 3: Flow Ranges

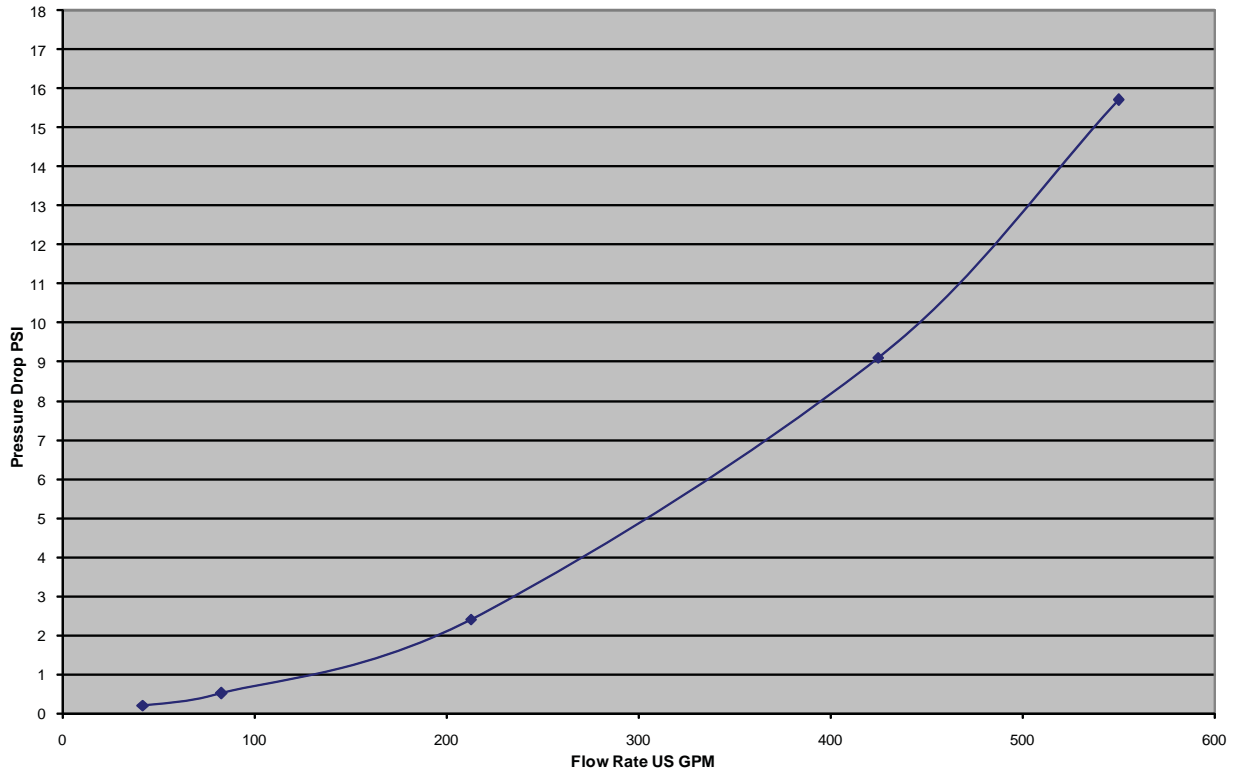
Meter Size	Flow Rate				Nominal K-Factor
	GPM	BPH	M3/HR	L/MIN	
DN80 and 3"	550*	786*	125*	2082*	160 PUL/ GAL +/- 10%
	425	607	97	1609	
	213	304	48	806	
	83	119	19	314	
	43	61	10	163	
	30*	43*	7*	114*	
DN100 and 4"	1000*	1429*	227*	3785*	96 PUL/ GAL +/- 10%
	700	1000	159	2650	
	350	500	79	1325	
	140	200	32	530	
	70	100	16	265	
	33*	47*	7*	125*	
DN150 and 6"	1200*	1714*	273*	4542*	96 PUL/ GAL +/- 10%
	1000	1429	227	3785	
	500	714	114	1893	
	250	357	57	946	
	100	143	23	379	
	40*	57*	9*	151*	

* Rates are in Extended Flow Ranges

Table 4: Shipping Weights and Volume

Model	Size	Unit	Weight
B27X	3" ANSI 150#	Lb	193
		Kg	88
	DN80 PN16	Lb	193
		Kg	88
	3" ANSI 300#	Lb	200
		Kg	91
DN80 PN 40	Lb	200	
	Kg	91	
B28X	4" ANSI 150#	Lb	293
		Kg	133
	DN100 PN16	Lb	193
		Kg	133
	4" ANSI 300#	Lb	300
		Kg	136
DN100 PN40	Lb	300	
	Kg	136	
B29X	6" ANSI 150#	Lb	350
		Kg	159
	DN150 PN 16	Lb	350
		Kg	159

Graph 1: 3" BiRotor Plus Pressure Drop Values



Graph 2: 4 & 6" BiRotor Plus Pressure Drop Values

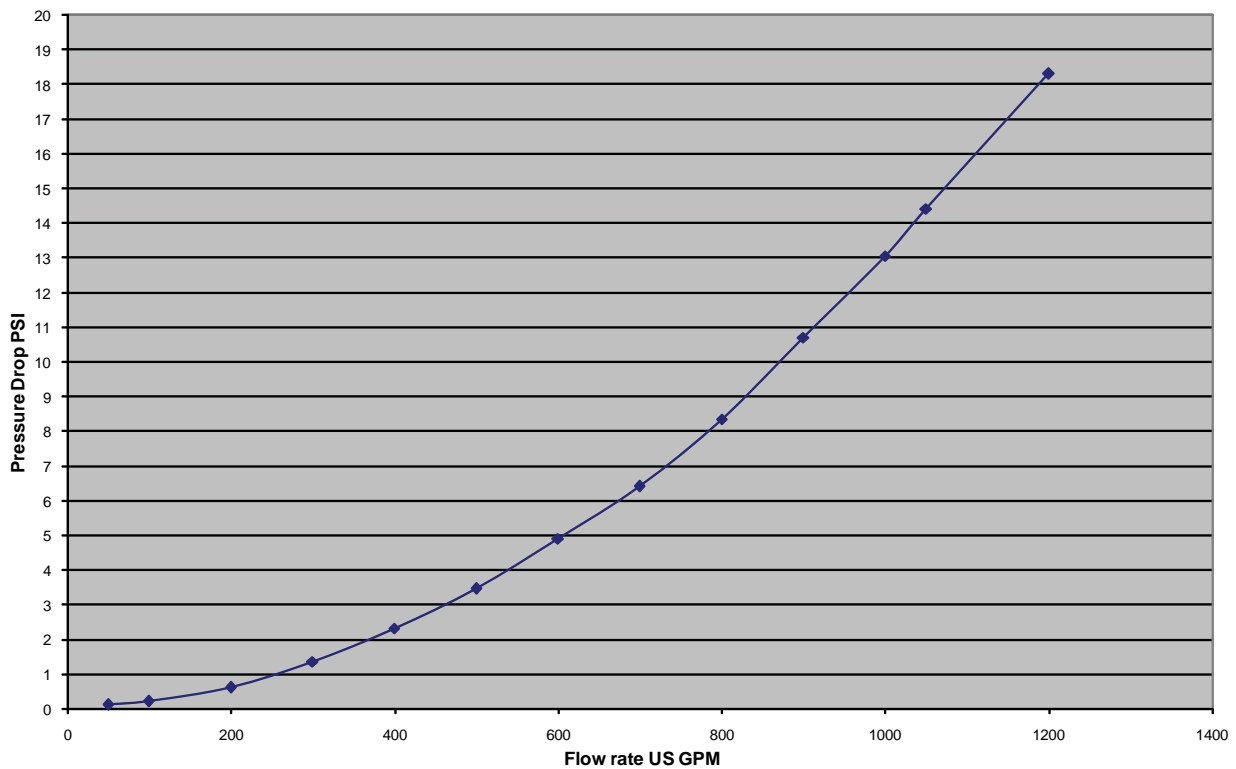


Figure 1: BiRotor Plus Dimensions

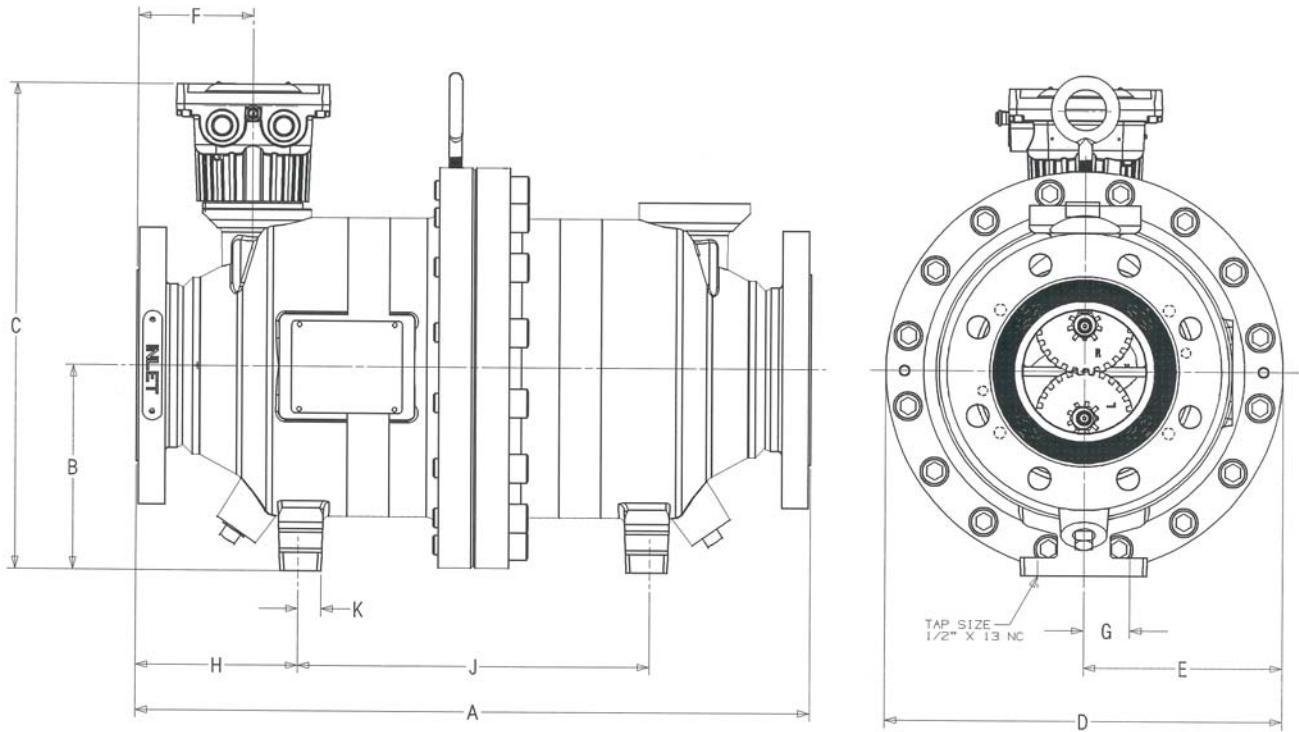


Table 5: Approximate BiRotor Plus Dimensions [Tolerance +/- 1/8" (3mm)]

Model	Size	Unit	A	B	C	D	E	G	H	J
B27X	3" ANSI 150#	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
	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

BRODIE
International
Engineering the Future

Brodie International

19267 Highway 301 North • Statesboro, GA 30461
Phone: 001.912.489.0200 • Fax: 001.912.489.0294

A Brodie Meter Co., LLC Company
www.brodieintl.com

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. Brodie Meter Co., LLC reserves the right to modify or improve the designs or specifications of such products at any time without notice.