

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	-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

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

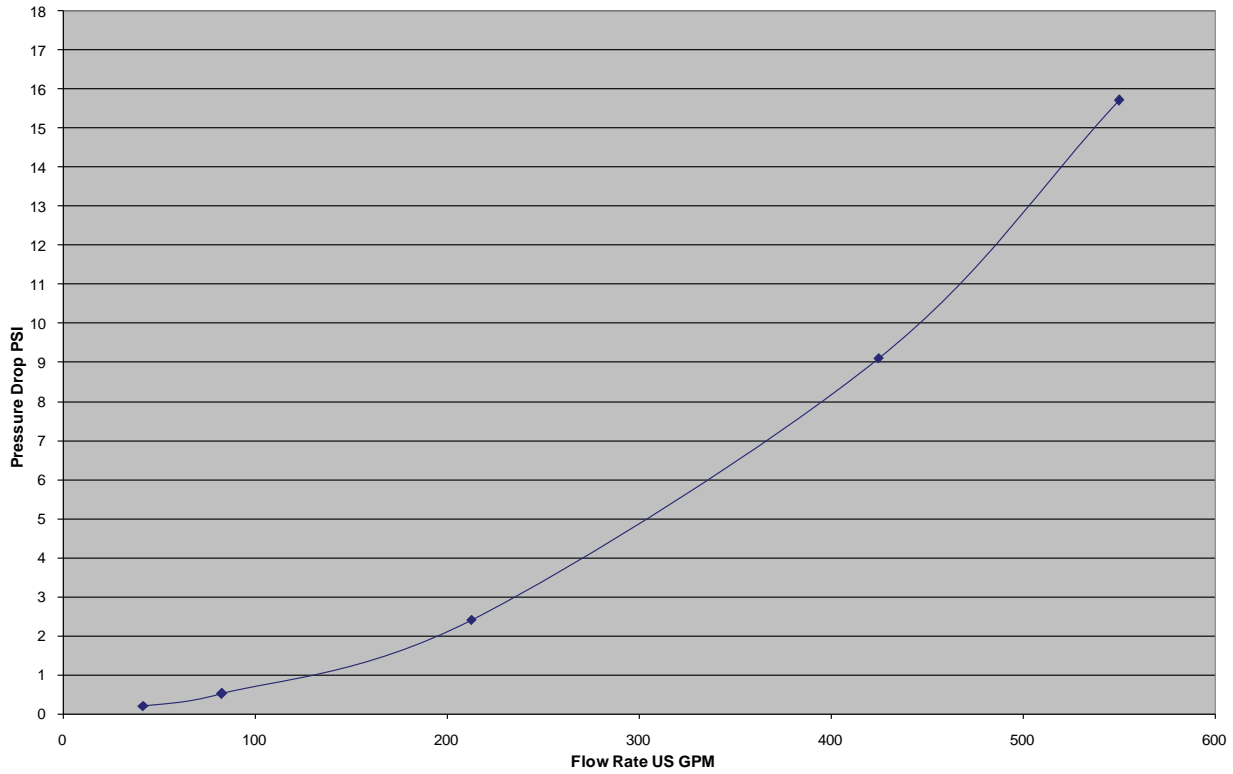
Meter Size	Flow Rate				Nominal K-Factor
	GPM	BPH	M3/HR	L/MIN	
DN80 and 3"	550*	786*	125*	2082*	160 PUL/ GAL +/- 10%
	425	607	97	1609	
	213	304	48	806	
	83	119	19	314	
	43	61	10	163	
	30*	43*	7*	114*	
DN100 and 4"	1000*	1429*	227*	3785*	96 PUL/ GAL +/- 10%
	700	1000	159	2650	
	350	500	79	1325	
	140	200	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

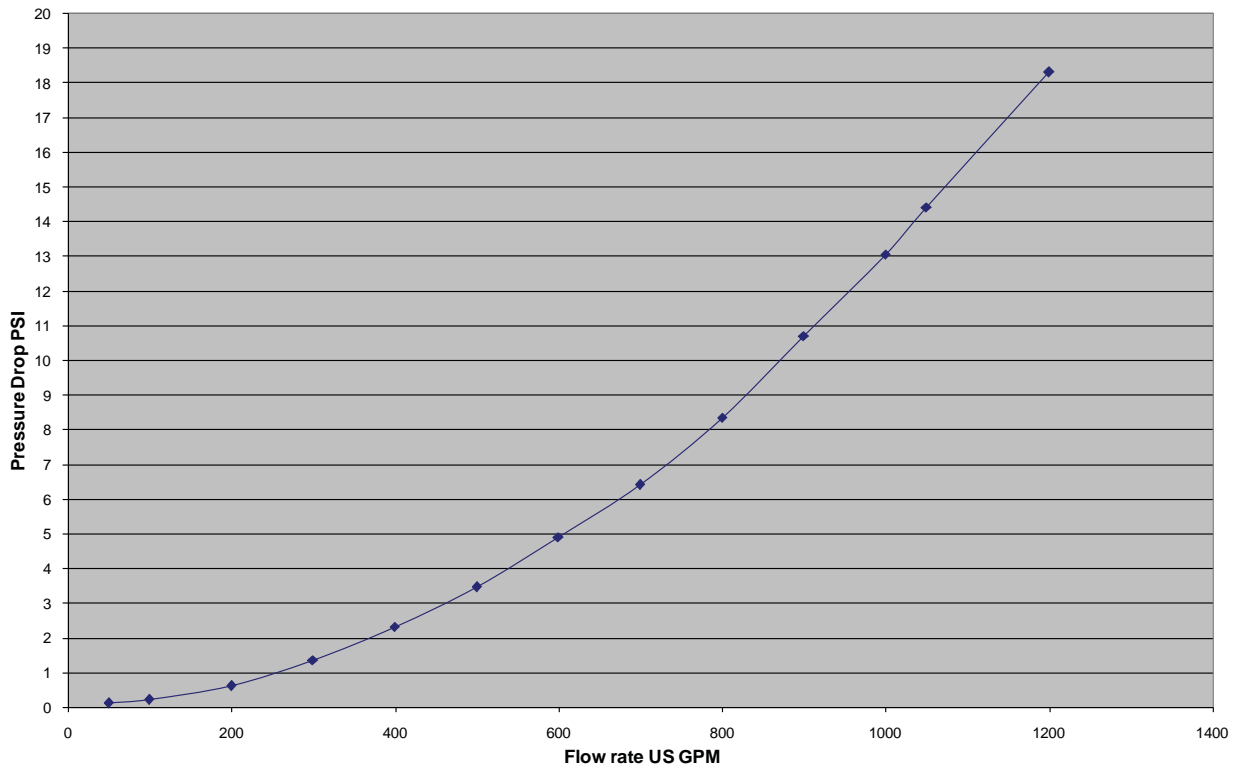


Figure 1: BiRotor Plus Dimensions

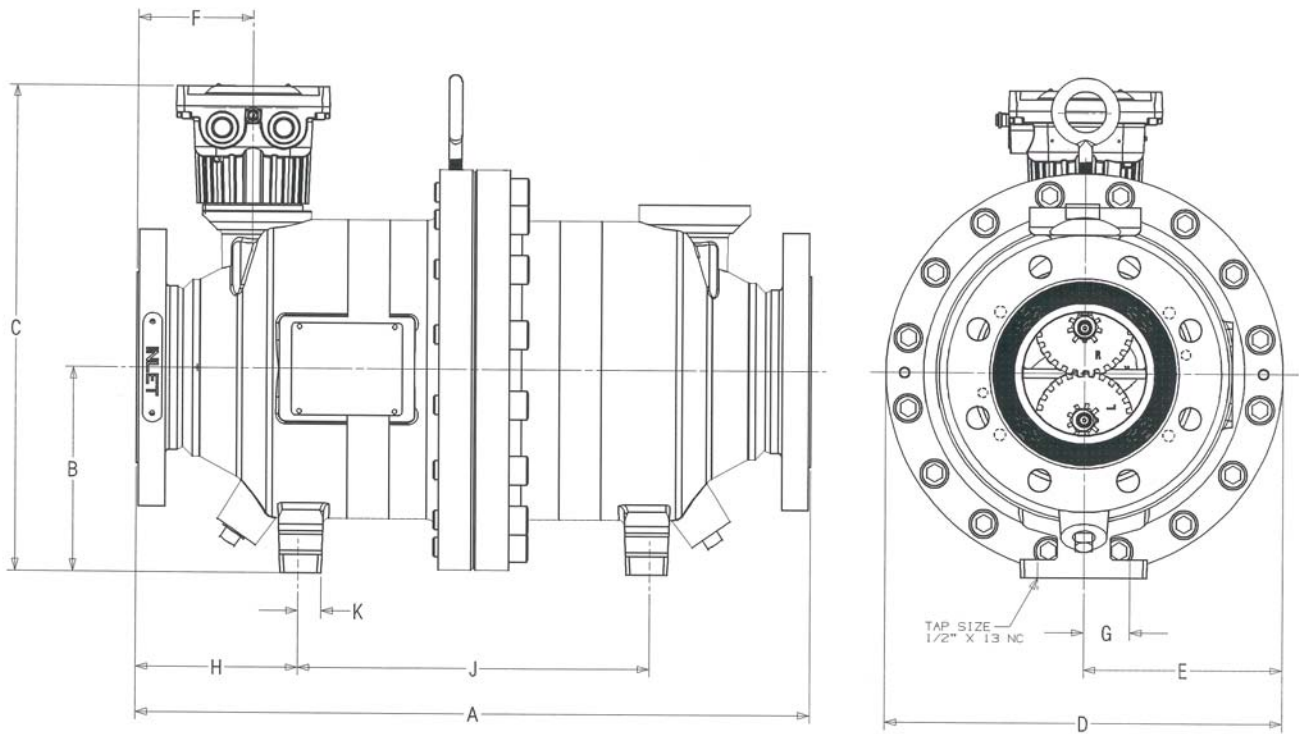


Table 5: Approximate BiRotor Plus Dimensions [Tolerance +/- 1/8" (3mm)]

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

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