



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

Connection Flanges: 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: 3": 416 Stainless Steel
 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.

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%

Table 1: Operating Temperature Limits

Seal Material	Degree F		Degree C	
	Min Operating Temp	Max Operating Temp	Min Operating Temp	Max Operating Temp
Low Swell Nitrile	-35	212	-37	100
Viton F	-15	400	-26	205
Fluoro Silicon	-100	350	-73	177
Low Temp Viton	-55	400	-48	205
Standard Pickoff	-40	225	-40	107
High Temp Pickoff	-40	400	-40	205

BiRotor Plus Approvals (B Revision)

Environmental

NEMA 4X
Type 4X
IP 65

Hazardous Area Approvals

Temp Ambient. -29 to 60°C, -29 to 140°F
CSA (United States and Canada)
Class 1, Division 1, Group C, and D Certificate:
2142875 221162

Weights and Measure

NTEP
Netherlands Weight and Measures
PTB Germany
MID Certified as a component for use with in a
measuring system as agreed within WELMEC GOST

Pressure Equipment

Canadian Registration: All Provinces

BiRotor Plus Approvals (C Revision)

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°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:

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

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)

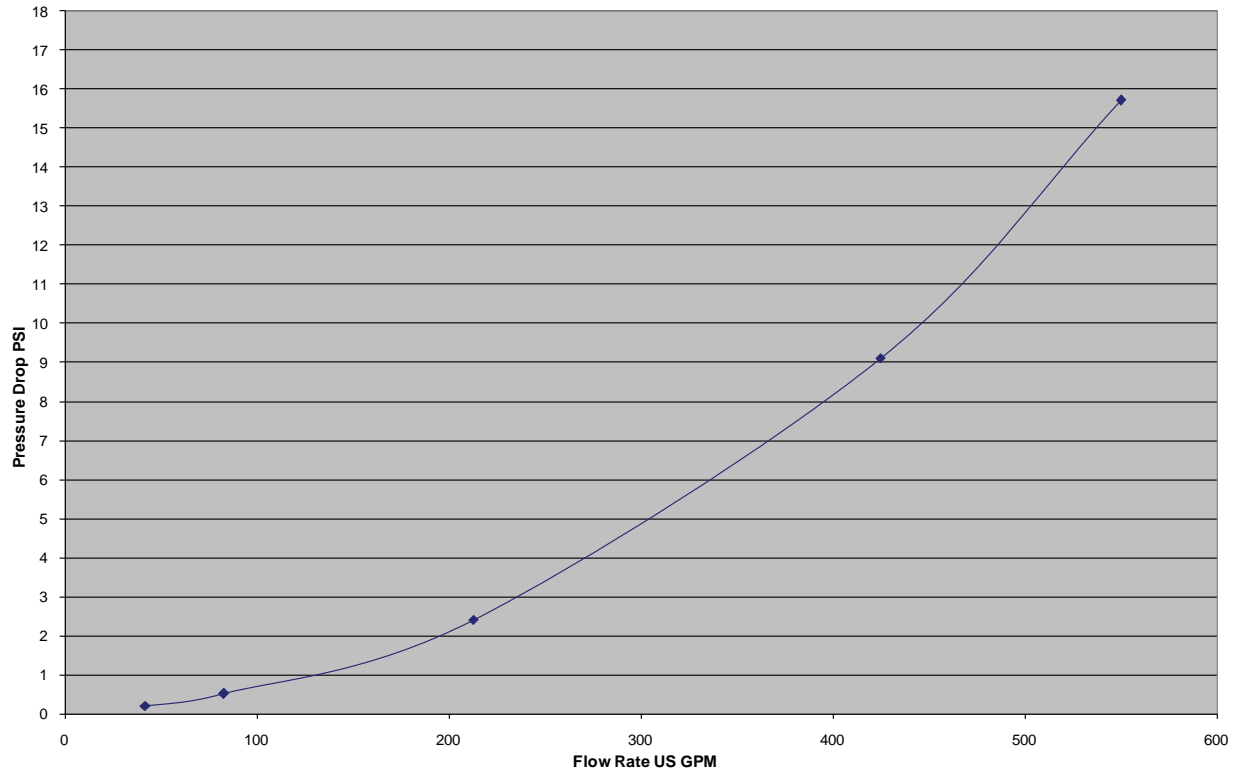
Table 3: Flow Ranges

Meter Size		Flow Rate								Nominal K-Factor
		GPM		BPH		L/MIN		M ³ /HR		
		Min	Max	Min	Max	Min	Max	Min	Max	
DN80 and 3"	Standard	43	425	61	607	163	1609	10	97	160 PUL/ GAL +/- 10%
	Extended	30	550	43	786	114	2082	7	125	
DN100 and 4"	Standard	70	700	100	1000	265	2650	16	159	96 PUL/ GAL +/- 10%
	Extended	33	1000	47	1429	125	3785	7	227	
DN150 and 6"	Standard	100	1000	143	1429	379	3785	23	227	96 PUL/ GAL +/- 10%
	Extended	40	1200	57	1714	151	4542	9	273	

Table 4: Shipping Weights and Volume

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

Graph 1: 3" BiRotor Plus Pressure Drop Values



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

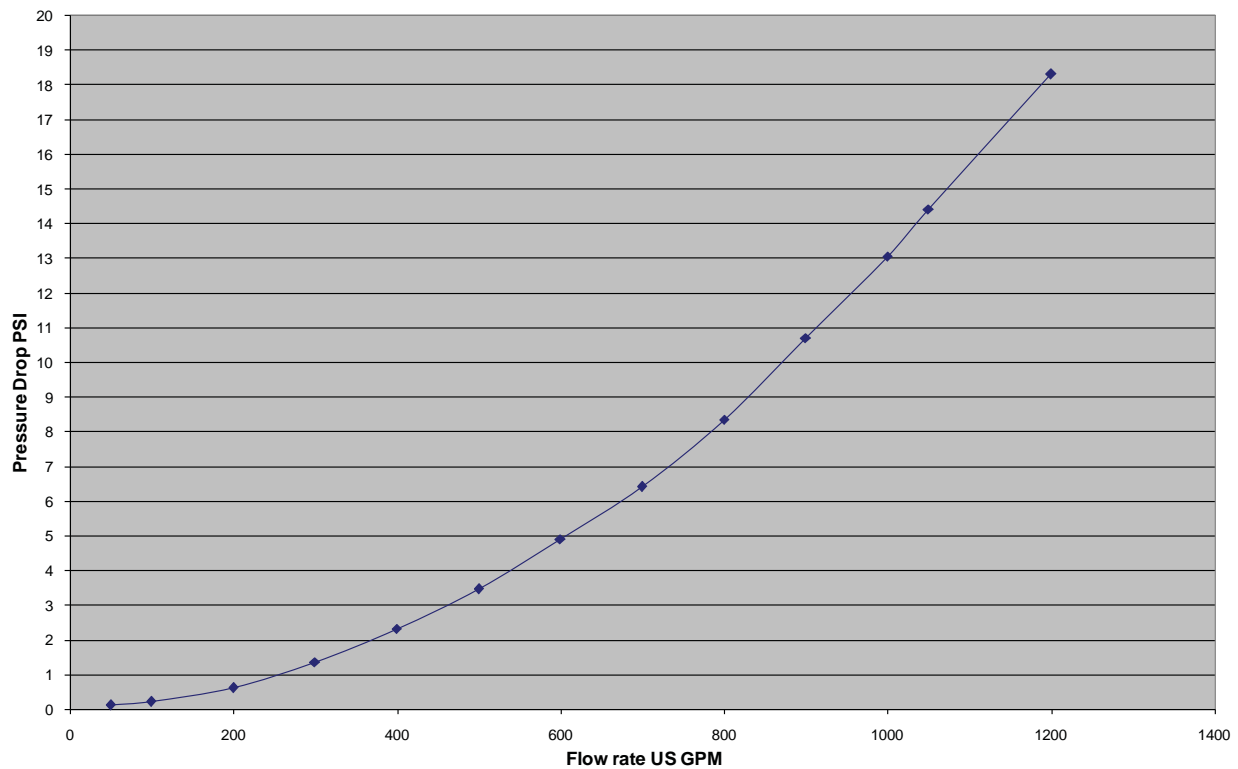


Figure 1: BiRotor Plus B Revision Dimensions (B27XB, B28XB, B29XB)

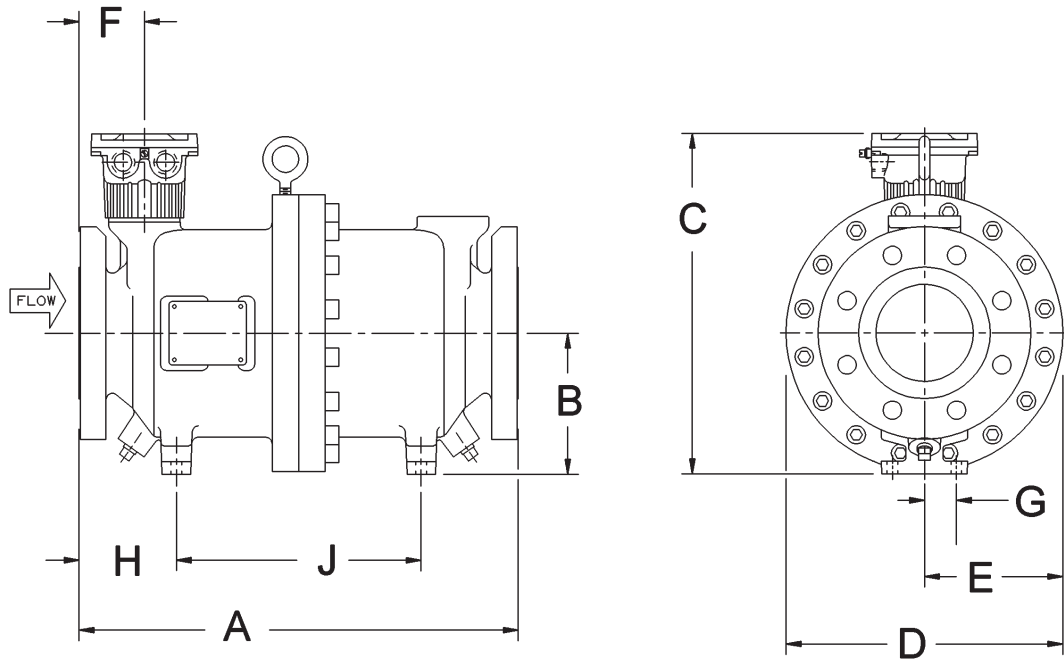


Table 5: Approximate BiRotor Plus B Revision Dimensions [Tolerance +/- 1/8" (3mm)]

Model	Size	Unit	A	B	C	D	E	F	G	H	J
B27XB	3" ANSI 150#	inch	16-3/4	6	14-5/8	11-1/2	5-3/4	2-5/8	1 3/8	3-5/8	9-19/32
		mm	425	152	372	292	146	67	35	92	242
	DN80 PN 16	inch	16-3/4	6	14-5/8	11-1/2	5-3/4	2-5/8	1 3/8	3-5/8	9-19/32
		mm	425	152	372	292	146	67	35	92	242
	3" ANSI 300#	inch	17-1/8	6	14-5/8	11-1/2	5-3/4	2-13/16	1-3/8	3-13/16	9-19/32
		mm	435	152	372	292	146	72	35	97	242
	DN80 PN 40	inch	17-1/8	6	14-5/8	11-1/2	5-3/4	2-13/16	1-3/8	3-13/16	9-19/32
		mm	425	152	372	292	146	72	35	97	242
B28XB	4" ANSI 150#	inch	20	6-5/8	16	13	6-1/2	2-3/4	1-1/2	4-1/4	11-1/2
		mm	508	168	406	330	165	70	38	108	292
	DN100 PN 16	inch	20	6-5/8	16	13	6-1/2	2-3/4	1-1/2	4-1/4	11-1/2
		mm	508	168	406	330	165	70	38	108	292
	4" ANSI 300#	inch	20-5/8	6-5/8	16	13	6-1/2	3-1/16	1-1/2	4-9/16	11-1/2
		mm	524	168	406	330	165	78	38	116	292
	DN100 PN 40	inch	20-5/8	6-5/8	16	13	6-1/2	3-1/16	1-1/2	4-9/16	11-1/2
		mm	524	168	406	330	165	78	38	116	292

Figure 2: BiRotor Plus C Revision Dimensions (B27XC, B28XC, B29XC)

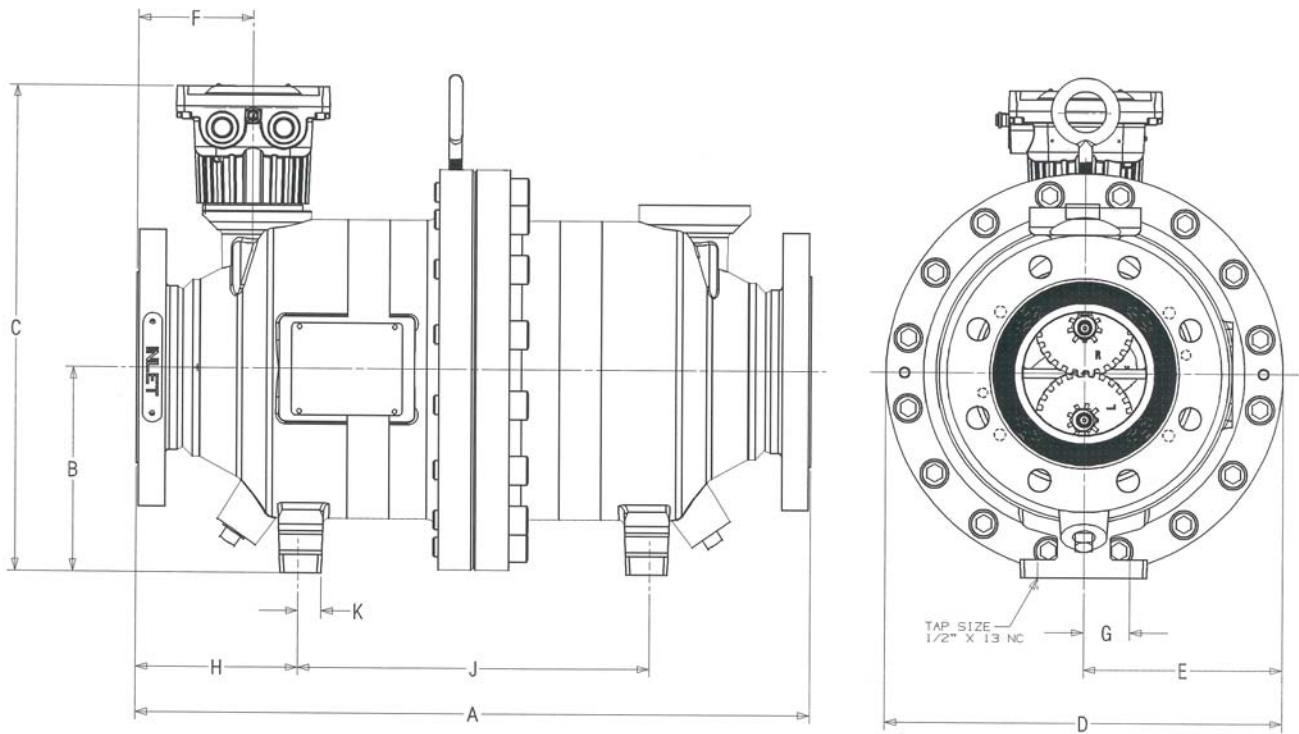


Table 6: Approximate BiRotor Plus C Revision Dimensions [Tolerance +/- 1/8" (3mm)]

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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