

Technical Data

BiRotor Plus Positive Displacement Meter



B27X	3" ANSI (DN80)	B30X	6" ANSI (DN150)
B28X	4" ANSI (DN100)	B31X	8" ANSI (DN200)
B29X	6" ANSI (DN150)	B32X	10" ANSI (DN250)

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 are 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% with a repeatability of 0.02% are better than any other meter in the industry.

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

B3XX Standard Rotors
 +/- 0.15% Over Standard Flow Range

Dependability

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

Affordability

In spite of its superior performance, Brodie offers 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.

Repeatability

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

Viscosity Range

Standard: 0.2 - 1000 cSt

Operating Temperature

STD: -20°F to 167°F (-29°C to 75°C)
 Low: -40°F to 167°F (-40°C to 75°C)
 High: 14°F to 230°F (-10°C to 110°C)

Flow Ranges

MODEL		GPM		BPH		l/min		m3/h		Nominal K-Factor +/-10%
		min	max	min	max	min	max	min	max	
B27X	standard	43	425	61	607	163	1609	10	97	160 PUL/GAL 42 PUL/L
	extended	30	550	43	786	114	2082	7	125	
B28X	standard	70	700	100	1000	265	2650	16	159	96 PUL/GAL 25 PUL/L
	extended	33	900	47	1429	125	3785	7	227	
B29X	standard	100	1000	143	1429	379	3785	23	227	96 PUL/GAL 25 PUL/L
B30X	standard	175	1750	250	2500	662	6624	39	397	40 PUL/GAL 11 PUL/L
B31X	standard	230	2300	329	3285	871	8706	52	522	40 PUL/GAL 11 PUL/L
B32X	standard	250	2500	357	3571	946	9462	56	567	40 PUL/GAL 11 PUL/L

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:

$$\Delta PA = (cPA)^{0.25} * (SGA)^{0.75} * \Delta Pm$$

Delta PA = Pressure Drop on Actual Fluid in PSI

cPA = Viscosity of Actual Fluid in cP

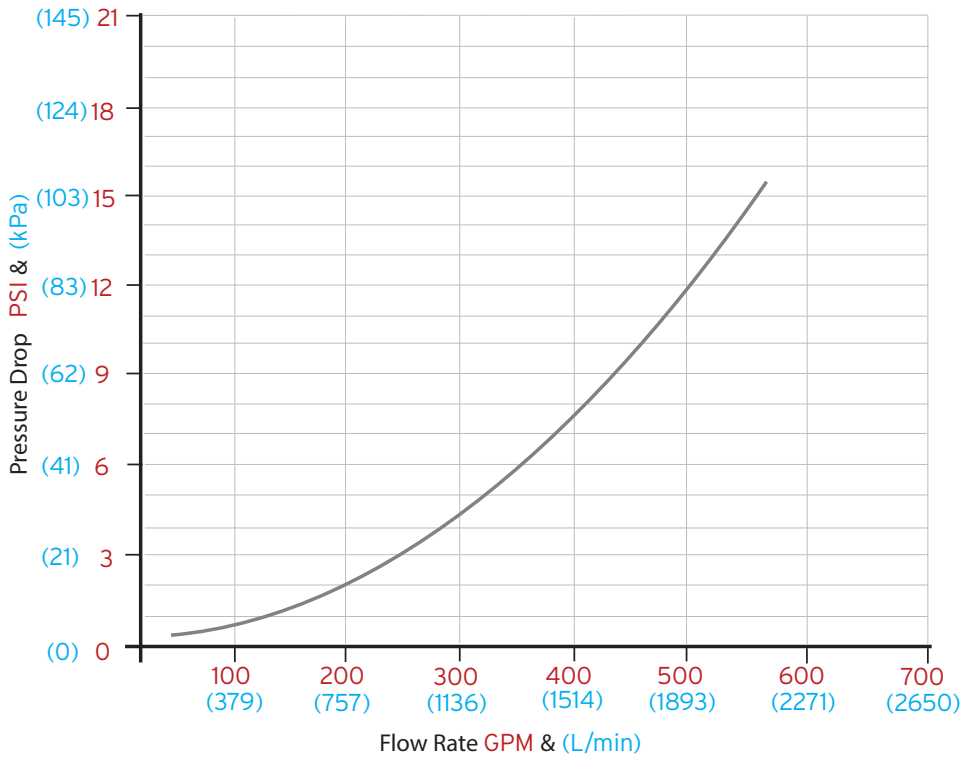
SGA = Density of Actual Fluid in SG

Delta Pm = Pressure Drop on Mineral Spirits

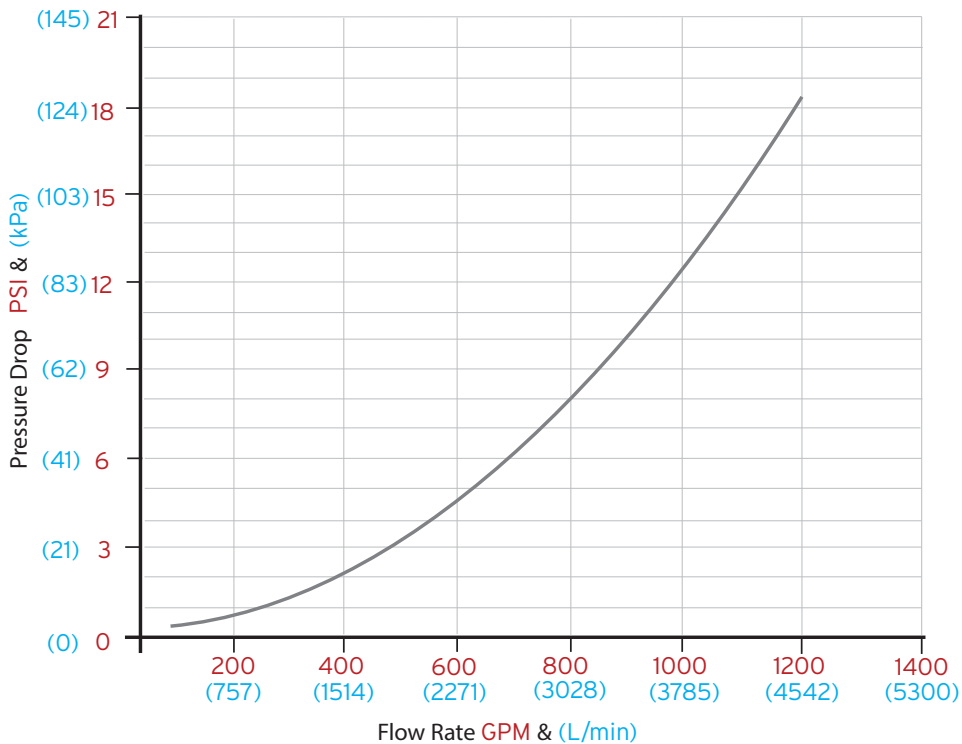
(See Graphs below for Reference)

Pressure Drop

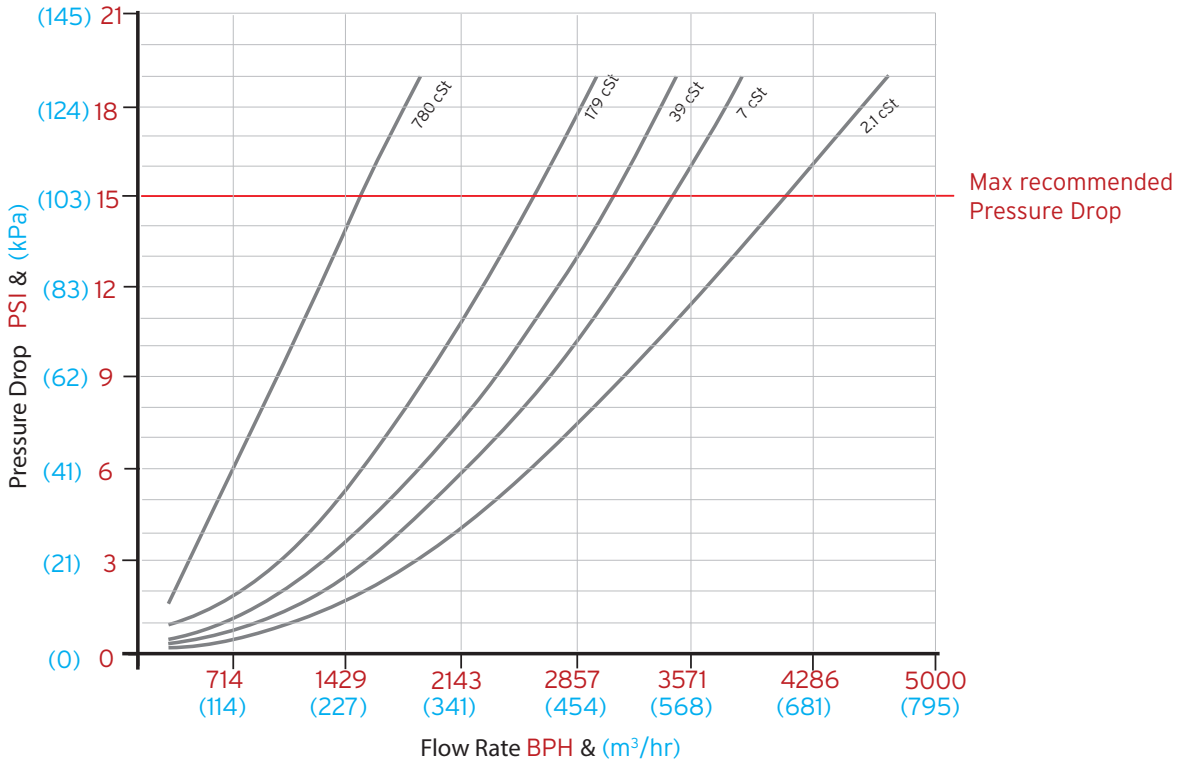
Model B27X



Models B28X & B29X



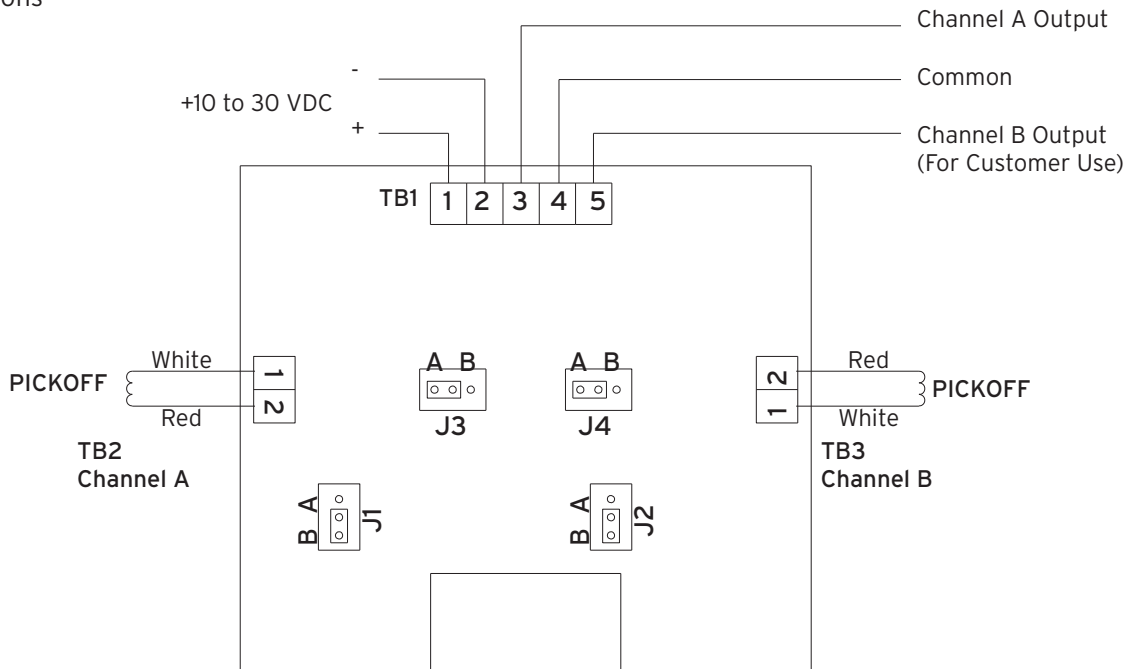
Models B30X, B31X, & B32X



Preamplifier

Supply voltage:	9 to 28 VDC	Variable voltage pulses:	0 to supply voltage less 5%
Outputs (jumper selectable):	square wave 0 to 5 KHz		70 mA max
5 V powered pulse:	0 - 5 VDC, 20 mA max		

Wiring Connections



Approvals

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

Weights and Measures

- NTEP (B27X, B28X, B29X)
- Measurement Canada (B27X, B28X, B29X)
- MID/OIML
- GOST (B27X & B28X)
- China (B27X & B28X)
- Australia NMI (B27X, B28X, B29X)
- Malaysia NMIM (B27X, B28X, B29X)
- Singapore Spring (B27X, B28X, B29X)

Pressure Equipment

- Under the EU Pressure Equipment Directive 97/23/EC
- Rated as SEP for ANSI 150# and PN 16 versions (For B27X & B28X)
- All other sizes & pressure ratings Rated as CAT 2
- Canadian Registration: All Provinces (B27X, B28X, B291)

Hazardous Area

- 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
- high temp pickoff: 14°F to 230°F, -10°C to 110°C

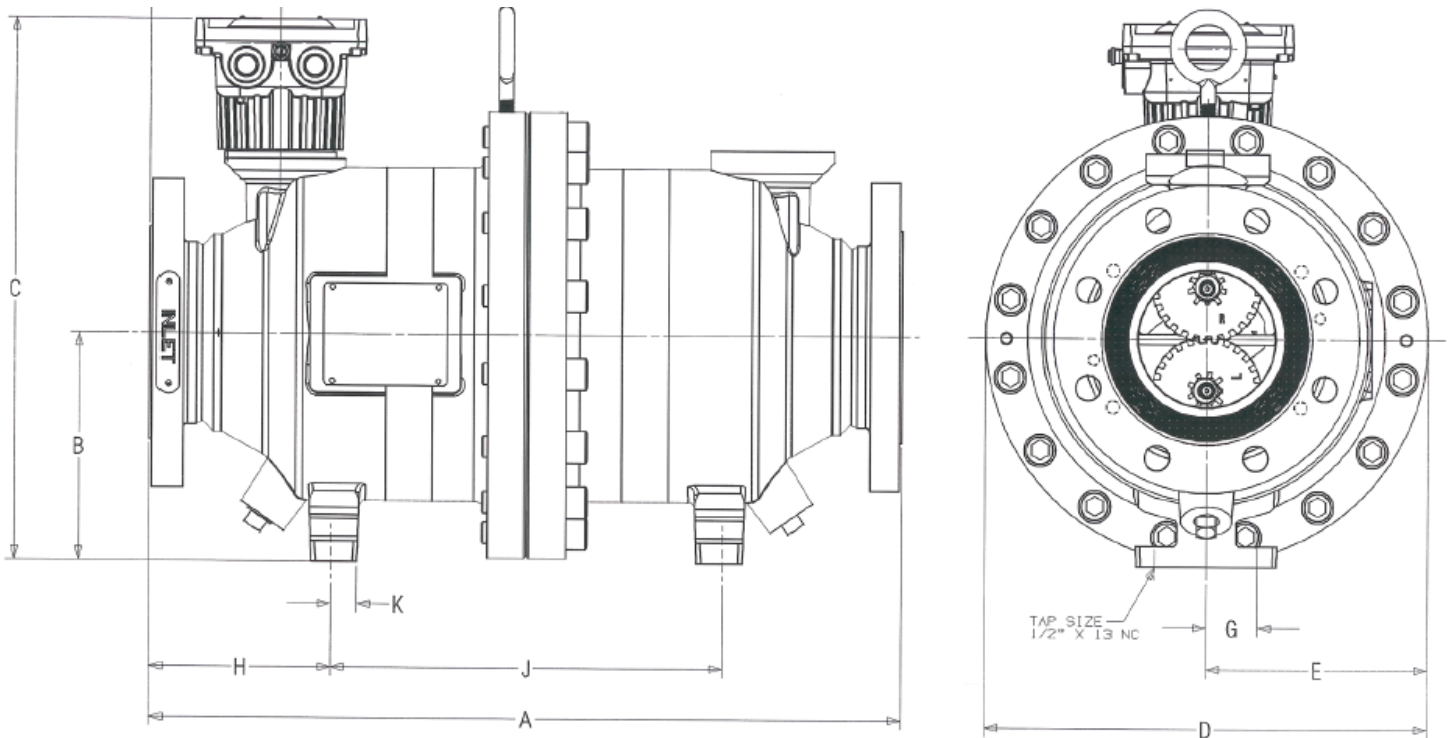
ATEX

- 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

IEC Ex

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

Dimensions



Standard BiRotor Plus Dimensions

Model	Size	Unit	A	B	C	D	E	G	H	J
B27XC	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
B28XC	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
B29XC	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	150	292
	DN 150 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	150	292

Dimensions Cont.

Model	Size	Unit	A	B	C	D	E	G	H	J
B30XC	6" ANSI 150#	inch	40	11 3/4	25 3/16	22 1/8	11 1/16	2 5/8	11 3/8	17 3/16
		mm	1016	298	640	562	281	67	289	436
	6" ANSI 300#	inch	42	11 3/4	25 3/16	22 1/8	11 1/16	2 5/8	11 3/8	17 3/16
		mm	1067	298	640	562	281	67	289	436
B31XC	8" ANSI 150#	inch	40	11 3/4	25 3/16	22 1/8	11 1/16	2 5/8	11 3/8	17 3/16
		mm	1016	298	640	562	281	67	289	436
	8" ANSI 300#	inch	42	11 3/4	25 3/16	22 1/8	11 1/16	2 5/8	11 3/8	17 3/16
		mm	1067	298	640	562	281	67	289	436
B32XC	10" ANSI 150#	inch	40	11 3/4	25 3/16	22 1/8	11 1/16	2 5/8	11 3/8	17 3/16
		mm	1016	298	640	562	281	67	289	436
	10" ANSI 300#	inch	42	11 3/4	25 3/16	22 1/8	11 1/16	2 5/8	11 3/8	17 3/16
		mm	1067	298	640	562	281	67	289	436

Special 'B' Rev BiRotor Plus Dimensions (Available upon request)

Model	Size	Unit	A	B	C	D	E	G	H	J
B27XB	3" ANSI 150#	inch	16 3/4	6 1/6	14 13/16	11 1/2	5 3/4	1 3/8	3 9/16	9 5/8
		mm	425	154	376	292	146	35	90	244
	DN80 PN 16	inch	16 3/4	6 1/16	14 13/16	11 1/2	5 3/4	1 3/8	3 9/16	9 5/8
		mm	425	154	376	292	146	35	90	244
	3" ANSI 300#	inch	17 1/8	6 1/16	14 13/16	11 1/2	5 3/4	1 3/8	3 3/4	9 5/8
		mm	435	154	376	292	146	35	95	244
DN80 PN 40	inch	17 1/8	6 1/16	14 13/16	11 1/2	5 3/4	1 3/8	3 3/4	9 5/8	
	mm	435	154	376	292	146	35	95	244	
B28XB	4" ANSI 150#	inch	20	6 5/8	16	13	6 1/2	11/2	4 1/4	11 1/2
		mm	508	168	406	330	165	38	108	292
	DN100 PN 16	inch	20	6 5/8	16	13	6 1/2	11/2	4 1/4	11 1/2
		mm	508	168	406	330	165	38	108	292
	4" ANSI 300#	inch	20 5/8	6 5/8	16	13	6 1/2	11/2	4 9/16	11 1/2
		mm	524	168	406	330	165	38	116	292
DN100 PN 40	inch	20 5/8	6 5/8	16	13	6 1/2	11/2	4 9/16	11 1/2	
	mm	524	168	406	330	165	38	116	292	

Materials Housing

Meter Housing: ASTM A352 LCB or
 ASTM A 216 WCB
 ASTM A 516 GR 70

Connection Flanges: ASTM A 105 Carbon Steel or
 ASTM A 350 LF2

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: 17-4 PH Stainless Steel (Heat Treated)

Bearings: Hybrid Ceramic

Elastomers: Low swell Nitrile, Viton®,
 or Fluoro Silicon are standard

UMB Housing: A356 T6 Cast Aluminium [non wetted
 component]

Shipping weights

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
B 30 X	6" ANSI 150#	lb	1250
		kg	567
	6" ANSI 300#	lb	1290
		kg	586
B 31 X	8" ANSI 150#	lb	1275
		kg	579
	8" ANSI 300#	lb	1330
		kg	604
B 32 X	10" ANSI 150#	lb	1290
		kg	586
	10" ANSI 300#	lb	1375
		kg	624

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