

# BL Series

## High Pressure Boltless Flowmeters

### Description

The patented, highly accurate Flow Technology BL Series positive displacement flowmeter is ideal for high pressure applications, such as methanol injection. By eliminating the need for high-strength fasteners, Flow Technology's unique "boltless" pressure vessel design provides inherent corrosion resistance in a compact, easy-to-maintain package.

### Features

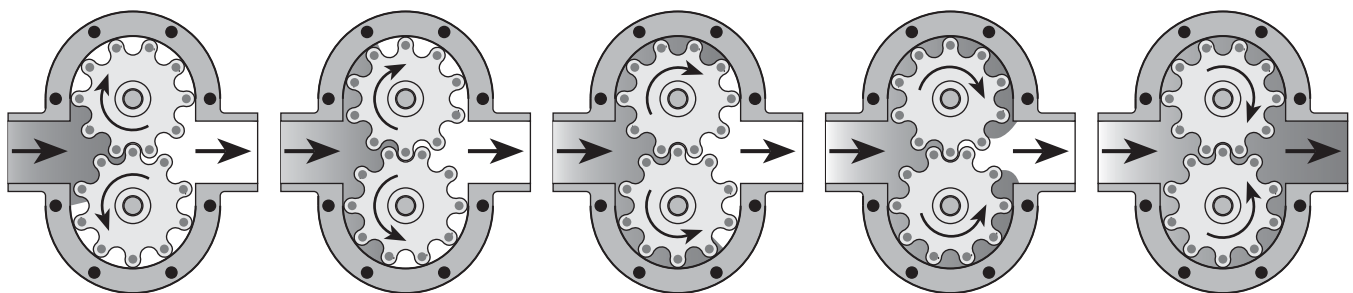
- Unique "boltless" pressure vessel design
- Metal seals standard
- Corrosion-resistant by design
- 6k to 15k psig operating pressure dependent on end fitting and size
- 1/16" to 1" line sizes
- Reference accuracy  $\pm 0.05\%$  of rate
- Only two moving parts
- Bearingless design
- Easy to install and maintain
- Handles viscosities from 0.3 to 1,000,000 cP+
- Operating temperatures up to 400° F (204° C)
- Wide range of applications
- Non-intrusive sensor
- Up to 1000:1 turndown on viscous fluids
- Handles pulsating flow



*BL Series*  
High Pressure Boltless Flowmeters

Protected by one or more U.S. Patents:  
4641522, 4815318, 4911010, 4996888, 5027653, 5325715

### Principle of Operation

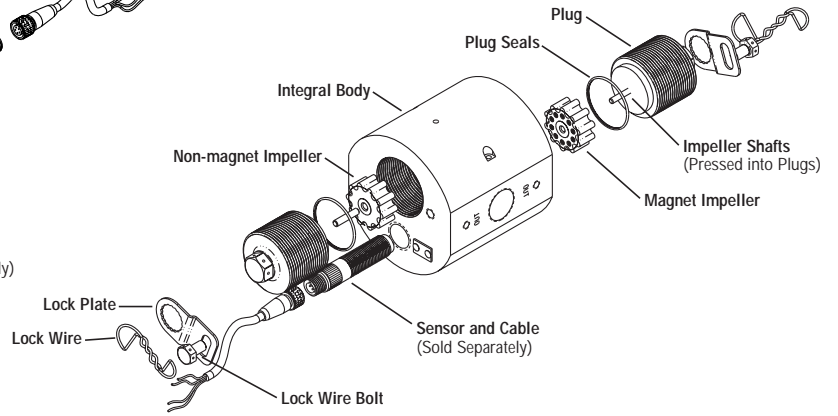
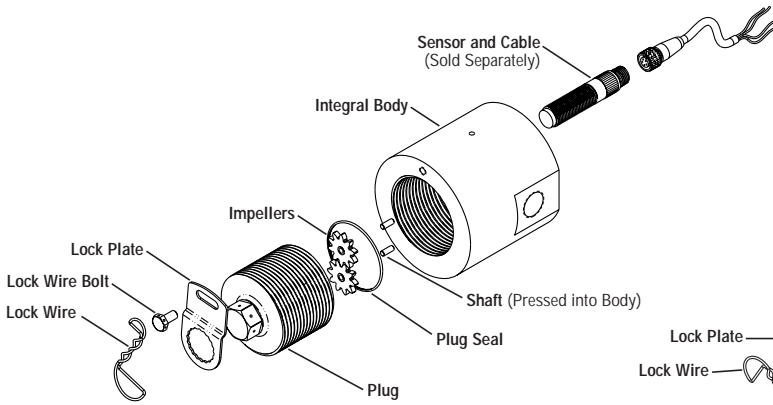


Flow Technology's positive displacement flowmeters use two rotating, thermoplastic impellers driven by the flowing liquid. Magnets imbedded in the impellers activate a non-intrusive sensor which generates a pulsed output signal. Each pulse represents a known volume of liquid that is captured in between the lobes of the impellers. A K-factor converts the pulses into engineering units for remote data collection and digital display.

# Flowmeter Assembly Diagrams

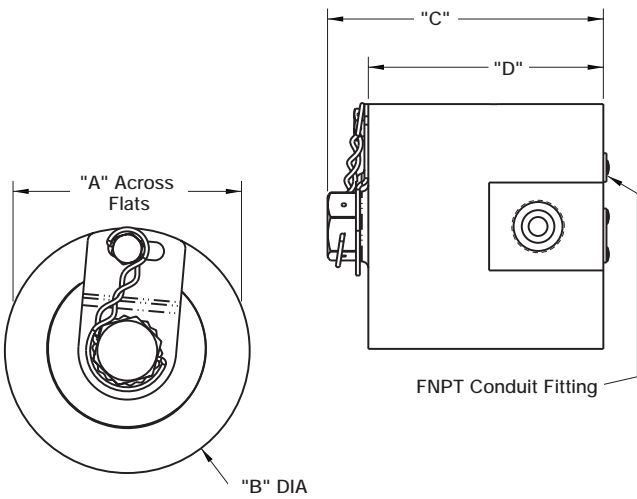
BL00Z, BL01Z

BL02Z, BL03Z, BL05Z, BL10Z

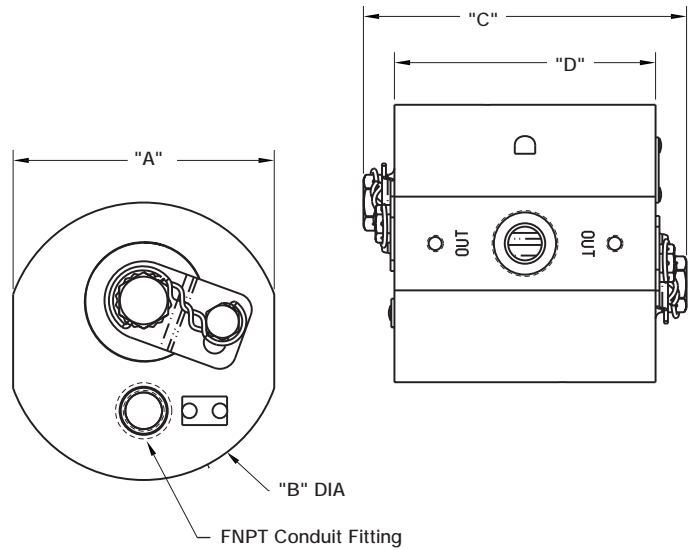


## Dimensions

BL00Z, BL01Z



BL02Z, BL03Z, BL05Z, BL10Z



## Dimensions

Basic Model No.	A		B		C		D		Conduit Fitting FNPT
	inches	mm	inches	mm	inches	mm	inches	mm	
<b>BL00Z</b>	3.5	89	3.75	95	4.23	107	3.60	91	3/4"
<b>BL01Z</b>	3.5	89	3.75	95	4.23	107	3.60	91	3/4"
<b>BL02Z</b>	4.0	102	4.25	108	4.95	126	4.00	102	3/4"
<b>BL03Z</b>	5.0	127	5.25	133	6.65	169	5.40	137	3/4"
<b>BL05Z</b>	6.0	152	6.25	159	7.90	201	6.65	169	3/4"
<b>BL10Z</b>	7.5	191	7.75	197	10.05	255	8.55	217	3/4"

## Specifications

### Process Temperature

Up to 400° F (204° C)  
based on impeller materials  
Temperatures above 100° F  
(38° C) reduce pressure  
rating (consult factory).

### Operating Pressure

FNPT end fittings, all meter sizes: 6,000 psig  
Autoclave end fittings, BL00 thru BL03: 15,000 psig  
Autoclave end fittings, BL05 and BL10: 10,000 psig  
**Note:** Based on 100° F (38° C) operating temperature

### Turndown Ratio

(model's max. rated flow ÷ its minimum flow rate)

Methanol 6:1 standard  
Low viscosity fluids 10:1 standard  
Medium viscosity fluids 100:1 standard  
High viscosity fluids Up to 1000:1

### Repeatability

(Reference Accuracy) ±0.05% of rate

**Note:** Each flowmeter is individually calibrated on a ballistic calibrator in the flow lab on a liquid representing the specific application. Minimum viscosity calibration fluid is 0.75 cP.

### Linearity

Typical ±0.5% of rate over upper  
80% of full span  
  
With enhanced signal  
conditioning Up to ±0.1% of rate over full  
turndown range

### Output

(Refer to individual product sheets for complete specifications)

Sensors (1 required per meter)  
*Hall Effect Sensor:* 4.75 to 24 VDC square-wave  
pulse depending on supply  
voltage, 3-wire  
FM Approved, intrinsically safe  
*Magnetic Pick-up Sensor:* 10 mV to 10 V sine-wave  
pulse depending on flow  
rate, 2-wire  
Explosion-proof optional  
*Surface Reference Pickup:* (Size 00 only)  
7–30 VDC square-wave pulse  
depending on supply  
voltage, 3-wire  
FM Approved, intrinsically  
safe available

Signal Conditioners  
and Transmitters

Refer to individual product  
sheets available from  
Flow Technology

### Materials of Construction

Integral Body (Case) 316 stainless steel  
Cover Plugs 316 stainless steel  
Shafts  
*Standard:* 316 stainless steel  
*Size 00:* Tungsten Carbide  
Impellers  
*Standard:* PPS  
*Size 00:* 440C  
O-Rings Teflon® coated Inconel 718  
Cover Plug Lock, Bolt 316 stainless steel

## Model Specifications

Basic Model No.	Nominal Size	Standard Connection	Maximum Flow Rate		Recommended Mesh Size	Weight	
			GPM	L/min.		lbs.	kg
<b>BL00Z</b>	1/16"	See Available End Fittings Table	0.5	1.89	625	8.2	3.7
<b>BL01Z</b>	1/8"		1	3.79	100	8.2	3.7
<b>BL02Z</b>	1/4"		3	11.4	100	15.2	6.9
<b>BL03Z</b>	3/8"		6	22.7	80	31.5	14.3
<b>BL05Z</b>	1/2"		12	45.4	80	53	24
<b>BL10Z</b>	1"		25	94.6	60	104	47

## Sensors

Basic Model No.	Magnetic	Approved Magnetic	Hall Effect	SRP	Approved SRP
<b>BL00Z</b>	N/A	N/A	N/A	SRP-221-QD	IS 100-05
<b>BL01Z</b>	3030-S21	3090-A	PS-910-QD	N/A	N/A
<b>BL02Z</b>	3030-S21	3090-A	PS-910-QD	N/A	N/A
<b>BL03Z</b>	3030-L21	3090-AL	PS-910-QD	N/A	N/A
<b>BL05Z</b>	3030-L21	3090-AL	PS-910-QD	N/A	N/A
<b>BL10Z</b>	3030-L21	3090-AL	PS-910-QD	N/A	N/A

## Model Numbering System

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Basic  
Model No.

Nominal Size

00 = 1/16"  
01 = 1/8"  
02 = 1/4"  
03 = 3/8"  
05 = 1/2"  
10 = 1"

Case Material

6 = 316 SS\*  
0 = Specify

Shaft Material

1 = 316 SS STD on BL01 thru BL10  
C = Tungsten Carbide STD on BL00  
0 = Specify

O-Ring Material

M = Metal O-Ring (Teflon® coated  
Inconel 718)\*  
0 = Specify

Impeller Material

5 = PPS\*  
T = 440C SS (Size 00 only)  
0 = Specify

Special Designator

000 = Standard Meter\*  
042 = 6000 psi  
(for NPT connections)

Connection Size (see table)

00 = Specify  
02 = 1/4"  
03 = 3/8"  
05 = 1/2"  
06 = 9/16"  
07 = 3/4"  
10 = 1"

Connection Type

1 = NPT (Female)\*°  
A = Autoclave\*  
0 = Specify

Impeller Style

5 = Normal Temperature\*  
A = Normal Temperature,  
Grooved +  
I = Integral Bearing, Metal Gear  
(Size 00 only)  
M = Tight Geometry, Methanol  
(120° F [49° C] max.)  
0 = Specify

## Available End Fittings

Nominal Connection Size	Basic Dims		Nominal Meter Size					
	Fitting OD	ID	00	01	02	03	05	10
<b>NPT</b>								
1/4"	.540"	.438"	X	X	X			
3/8"	.675"	.578"			X	X		
1/2"	.840"	.466"	X	X	X	X		
3/4"	1.050"	.614"			X	X	X	
1"	1.315"	.599"					X	X
<b>Autoclave</b>								
3/8"	.375"	.203"	X	X				
9/16"	.563"	.312"	X	X	X			
3/4"	.750"	.438"			X	X		
1"	1.00"	.562"					X	X

## Material Guide

Name	Description
<b>316 SS</b>	316 Stainless Steel
<b>PPS</b>	Polyphenylene Sulfide, Ryton® by Phillips Petroleum
<b>Inconel 718</b>	Teflon® coated Inconel 718 (O-Ring material)
<b>440C SS</b>	440C Stainless Steel

## Key

*	Standard Configuration
CF	Consult Factory
°	Must use 042 special designator
+	Not available in size 01 and 02 meters

Specifications are for reference only and are subject to change without notice.

Local Representative:



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