

## BFM Series Electromagnetic Flowmeter

### General

BFM Series Electromagnetic Flowmeter conducts measurement based on the principle of the Faraday Electromagnetic Induction Law. When conductive liquid flows in a magnetic field and incises the magnetic flux, Induced electromotive force E will be generated in the conductor, as follow.

$$E = kBDV$$

Where,

k-----Instrument constant B-----Magnetic induction density

V-----Average velocity in the cross section of a measured pipe

D-----Inner diameter of a measured pipe

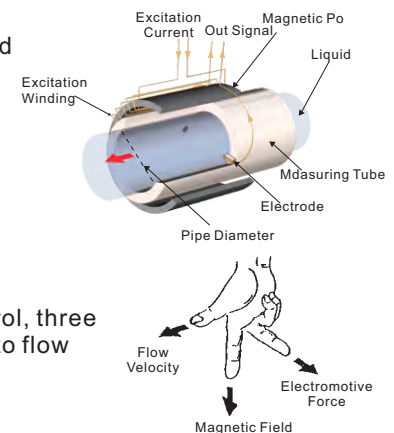
When measuring flow rate, the conductive liquid flows at a velocity of V perpendicularly through a magnetic field, which induces a voltage that is direct proportional to the average velocity. The induced voltage signal is measured on two or more poles immediately contacted with the liquid, sent to a convertor through the cable, and then intelligitized before it is transferred to and displayed in a LCD or converted into 4~20mA or 0~1kHz output.

**Patent No.:ZL 03 2 63802.7**



### Feature And Usage

- Independence:When the temperature, pressure, viscosity and density of the measured fluid changing, the flowmeter will not be influenced.
- Easy Maintenance: No moving parts in measuring tube, so easy maintenance.
- Wide Application: Can measure conductivity liquid, Without reference to fibre,solid or suspending material contained in liquid.
- Easy Installation: Install any angle only need liquid full of the pipe. Straight pipe requires 2D for upper stream and 1D for down stream
- Turndown Ratio: The turndown ratio can reach to 1:100
- Enclosure: For DN15~DN1200 is IP68
- High intelligence: Back light English/Chinese LCD display, Menu setting control, control, three grades password protection, Two-way measuring available, slight signal removal, Auto flow compensation and other function.
- SMT Technical: Intelligence self-detect and self-diagnoses, many kinds of alarming
- SMART Excitation: Low power consumer, zero stability, longtime reliability
- Multi-Signal Output: 4-20mA or 0-10mA current output, Standard Pulse Output, RS485 computer communication output
- Selecting the right lining and electrode material can measure nearly all conductive liquid.
- The power supply system has good voltage vibration adaptability.



Square Transmitter

### Main Technical Datum

- Accuracy: 0.3%, 0.5% and 1.0%
- Repeatability: 0.15%, 0.25% and 0.5%
- Ambient Temperature: Sensor (Separate Type): -20~+70 °C  
Converter: -20~+50 °C  
Integral type: -10~+50 °C
- Humidity: 5%~95%RH (No Frost)
- Vibration: Frequency 55Hz  
Amplitude: 0.55mm
- Ambient magnetic field: ≤400A/m
- Fluid Temperature: Integral Type ≤+80 °C  
Separate Type(Rubber Lining)≤+80 °C (PTFE Lining)≤+120 °C
- Nominal Pressure: 0.6MPa~32.0 MPa Liquid Conductivity: ≤5 u/cm
- Power Supply: DC24V±5% or 100-240VAC 47~63Hz
- Enclosure: IP68(For separate type with synthetic rubber lining only)
- Output Signal: 4-20mA/0-10mA, Standard Pulse output
- Communication: RS485 Computer Interface and HART Protocol
- Alarm Output: Alive



Electrode Material: Stainless Steel, Hastelloy, Titanium, Tantalum, Carbonized Tungsten, platinumiridium  
 Lining Material: PTFE, Synthetic Rubber  
 Flange Material: Cast Steel and Stainless Steel  
 Measuring Tube: Stainless Steel  
 Anti-explosion Grade: ExdeiaC II T<sup>4</sup>, Anti-explosion No.: GYB3542  
 Flange Standard: Any Flange Standard can be custom-made.

## Electrode Material Selection

Table 1

Electrode Material	Eroding Performance
Stainless Steel	For water, waste water inorganic or organic acid nitric acid, lower than 5% vitriol in room temperature, boiling phosphoric acid, formic acid, aqueous alkali, and sulfurous acid, sea water, and acetic acid in a certain amount of pressure.
Hastelloy	seawater and brine
Carbonized Tungsten	For no eroding but high wear and tear liquid
Titanium	Seawater, various chlorid and hypochlorite, gasified acid (including fuming nitric acid), organic acid, and alkali.
Tantalum	Chemical liquid, including boiling muriatic acid, nitric acid, and 175 °C-down vitriol, but excluding hydrofluoric acid, fuming nitric acid alkali.
Platinum/Iridium	Various acid, alkali, and salt, but excluding aqua fortis.

## Lining Material Selection

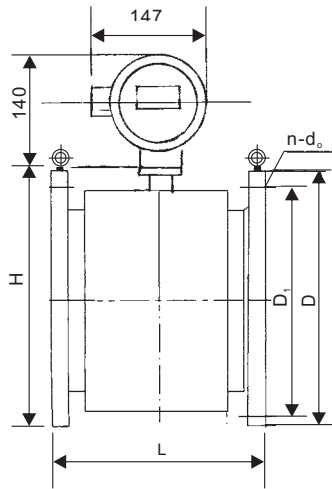
Table 2

Lining Material	Main Performance	Temperature Range
PTFE	1) Resistant muriatic acid, vitriol, nitric acid, aqua regia, concentrated alkali, and organic solvent; 2) Good wearability and bad cohesion -80~+180 °C 3) Quite good resilience, wearability, and breaking tenacity	-20~+120 °C
Synthetic Rubber	1) Anticorrosive to normal weak acid and alkaline. < 80 °C; 2) Water and sewage.	<+80 °C

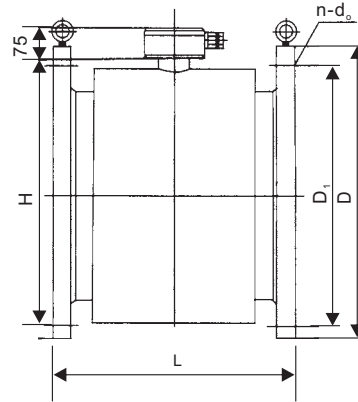
## Flow Range And Nominal Diameter Selection

Table 3

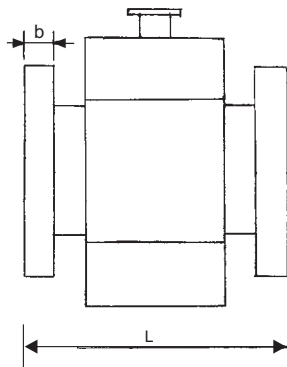
DN (mm)	Flow Range(m <sup>3</sup> /h)		DN (mm)	Flow Range(m <sup>3</sup> /h)	
	Flow Velocity 0.3~1.0m/s	Flow Velocity 1.0~10m/s		Flow Velocity 0.3~1.0m/s	Flow Velocity 1.0~10m/s
15	0.19~0.64	0.64~6.4	400	136~452	452~4520
20	0.34~1.33	1.13~11.3	450	172~572	572~5720
25	0.53~1.77	1.77~17.7	500	212~707	707~7070
32	0.87~2.89	2.89~28.9	600	306~1020	1020~10200
40	1.35~4.50	4.50~45.0	700	416~1385	1385~13850
50	2.13~7.10	7.10~71.0	800	543~1810	1810~18100
65	3.57~11.9	11.9~119	900	687~2290	2290~22900
80	5.43~18.1	18.1~181	1000	849~2830	2830~28300
100	8.49~28.3	28.3~283	1200	1221~4070	4070~40700
125	13.3~44.2	44.2~442	1400	1662~5540	5540~55400
150	19.1~63.6	63.6~636	1600	2172~7240	7240~72400
200	33.9~113	113~1130	1800	2748~9160	9160~91600
250	53.1~177	177~1770	2000	3393~11310	11310~113100
300	76.2~254	254~2540	2200	4100~13680	13680~136800
350	104~346	346~3460	2400	4480~16280	16280~162800



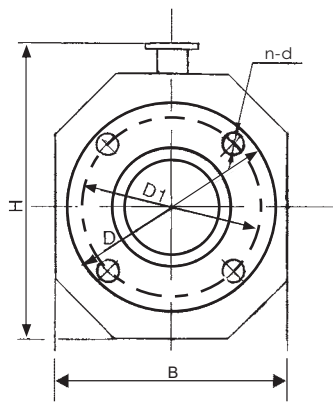
a Integral Type  
(≥DN100)



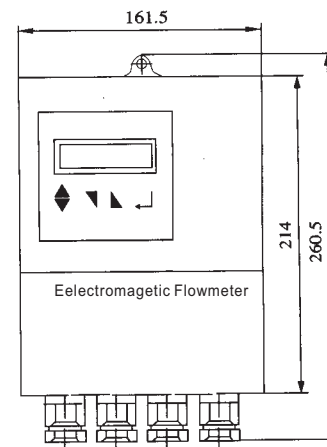
b Separate Type  
(≥DN100)



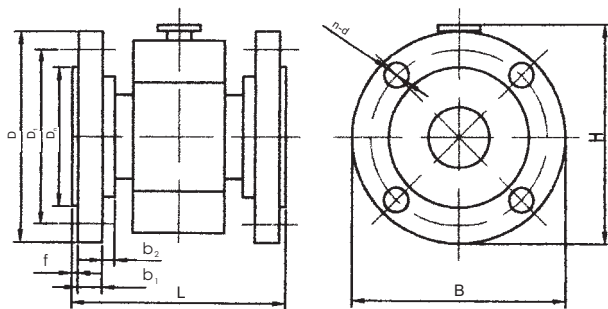
c Sensor (DN15~DN80)



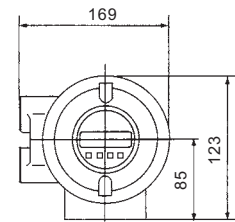
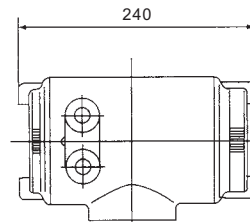
(DN15~DN80)



Intelligence Transmitter (Square Type)



d Outline Dimension Of medium And High Pressure Sensor



BFM Transmitter (Round Type)

Note: The Total Length L1 Includes Lining Dimension

$$L1 = L + 2S \pm 5 \text{ (Allow)}$$

L: Means Thenory Length

S: Means Grounding Loop S=5mm(Only Match With PTFE Lining)

## Outline Dimension of General Pressure Sensor

Table 4

DN (mm)	Sensor Dimension (mm)			Flange Connection dimension (mm)					Net Weight (kg)
	L	B	H	D	D <sub>1</sub>	n-d	Th	b	
PN4.0MPa JB/T82-94/GB9119.10-2000									
15	200	130	220	95/95	65	4-Ø14	M12	16	8
20	200	130	220	105/105	75	4-Ø14	M12	18	10
25	200	142	230	115/115	85	4-Ø14	M12	18	12
32	200	142	230	135/140	100	4-Ø18	M16	20	14
40	200	158	255	145/150	110	4-Ø18	M16	22	16
50	200	170	260	160/165	125	4-Ø18	M16	24	18
65	200	185	275	180/185	145	8-Ø18	M16	24	22
80	200	200	285	195/200	160	8-Ø18	M16	26	26
100	250	235	290	230/235	190	8-Ø23	M20	28	30
125	250	270	325	270/270	220	8-Ø25	M22	30	36
150	300	300	350	300/300	250	8-Ø25	M22	30	42
PN1.6MPa JB/T82-94/GB9119.4-2000									
200	350	340	385	335/340	295	12-Ø23	M20	30	55
250	400	405	445	405/405	355	12-Ø25	M22	32	70
300	500	460	515	460/460	410	12-Ø25	M22	32	85
350	500	520	570	520/520	470	16-Ø25	M22	34	100
400	600	580	630	580/580	525	16-Ø30	M27	38	120
450	600	640	690	640/640	585	20-Ø30	M27	42	150
500	600	715	760	705/715	650	20-Ø34	M30	48	200
600	600	840	880	840/840	770	20-Ø41	M36	50	260
PN1.0MPa GB9115.3-2000									
700	700	895	970	895	840	24-Ø30	M27	46	360
800	800	1015	1080	1015	950	24-Ø33	M30	52	460
900	900	1115	1180	1115	1050	28-Ø33	M30	56	570
1000	1000	1230	1285	1230	1160	28-Ø36	M33	62	730
PN0.6MPa GB9119.2-2000									
1200	1200	1405	1480	1405	1340	32-Ø33	M30	60	600
1400	1400	1630	1695	1630	1560	36-Ø36	M33	68	840
1600	1600	1830	1895	1830	1760	40-Ø36	M33	76	1330
1800	1800	2045	2110	2045	1970	44-Ø39	M36	84	1800
2000	2000	2265	2315	2265	2180	48-Ø42	M39	92	2300
PN0.6MPa GB9115.2-2000									
2200	2200	2475	2520	2475	2390	52-Ø42	M39	42	2800
2400	2400	2685	2725	2685	2600	56-Ø42	M39	44	3300
2600	2600	2905	2950	2905	2810	60-Ø48	M45	46	3880
2800	2800	3115	3165	3115	3020	64-Ø48	M45	48	4930
3000	3000	3315	3365	3315	3220	68-Ø48	M45	50	5580

## Model Selection

Table 6

Type	1	2	3	4	5	6	7	8	Note
	DN	Nominal Pressure	Pipe Connect	Power	Lining Material	Electrode Material	Structure	Output Signal	
BFM	—								Flowmeter
	015								DN:15mm
	020								DN:20mm
	025								DN:25mm
	032								DN:32mm
	040								DN:40mm
	050								DN:50mm
	065								DN:65mm
	080								DN:80mm
	100								DN:100mm
	125								DN:120mm
	150								DN:150mm
	200								DN:200mm
	250								DN:250mm
	300								DN:300mm
	350								DN:350mm
	X								Others shown in table 7
		0							PN:0.6MPa
		1							PN:1.0MPa
		2							PN:1.6MPa
		3							PN:2.5MPa / Class150
		4							PN:4.0MPa
		5							PN:6.3MPa / Class300
		6							PN:10MPa / Class600
		7							PN:16MPa / Class900
		8							PN:25MPa / Class1500
		9							PN:42MPa / Class2500
			1						GB/DIN Standard Flange
			2						ANSI Standard Flange
			3						Other Standard Flange
				1					AC(85~250)V
				2					DC(16~36)V
				3					Battery
					1				PTFE
					2				Synthetic Rubber
					3				Other material
						1			316L Stainless Steel
						2			Hastelloy B
						3			Hastelloy C
						4			Tantalum
						5			Other material
							1		Integral Type(Round Converter)
							2		Integral Type(Square Converter)
							3		Separate Type
							4		Separate and Immersion Type (IP68)
							5		Integral Type (Anti-explosion)
							6		Separate Type (Anti-explosion)
								1	4~20mA or Standard Pulse Output
								2	RS-485Communication Interface
								3	HART Communication

Example: BFM-1504221151

Note:

BFM Electromagnetic Flowmeter,  
 Nominal Diameter: 150mm, Nominal Pressure:4.0MPa,  
 Flange Connection: Flange, Power:DC(18~36)V,Lining  
 Material: PTFE, Electrode Material: 316L, Structure:  
 Integral Type, Anti-Explosion Grade: ExdeialICT4, Output  
 Signal: 4-20mA.

Table 7

Code	DN(mm)	Code	DN(mm)	Code	DN(mm)
400	400	900	900	201	2000
450	450	101	1000	221	2200
500	500	121	1200	241	2400
600	600	141	1400	261	2600
700	700	161	1600	281	2800
800	800	181	1800	301	3000



Note: In a general way, it is extremely not recommended to install this kind of flowmeter at proximity of an important heat source or strong magnetic field.

### Ordering Information

Please carefully read this manual before ordering. Then select the proper model according to the measured fluid and working condition. Or please send the following technical datum to the manufacturer, we will recommend the proper model to the buyer.

1. BFM Electromagnetic Flowmeter Model: BFM-\_\_\_\_\_
2. Fluid Name: \_\_\_\_\_
3. Fluid Pressure: \_\_\_\_\_ MPa
4. Fluid Temp.: Max. \_\_\_\_\_ Normal \_\_\_\_\_ Min. \_\_\_\_\_
5. Flow Range: Max. \_\_\_\_\_ Normal \_\_\_\_\_ Min. \_\_\_\_\_ m<sup>3</sup>/h
6. Accuracy: \_\_\_\_\_