

ELECTROMAGNETIC FLOW METER

SpiraMAG® SERIES

1. IDENTIFICATION

Manufacturer	Bopp & Reuther Messtechnik Am Neuen Rheinhafen 4 67346 Speyer / Germany Phone: +49 6232 657-0 Fax: +49 6232 657-505
Product type	Electromagnetic flow meter
Product name	SpiraMAG® Series with transmitters Model BR720/BR730



2. RANGE OF APPLICATION

The SpiraMAG® Series are best suited for bi-directional flow measurement of fluids with a minimum conductivity of 5 $\mu\text{S}/\text{cm}$. The meters are highly accurate (better than $\pm 0.3\%$ of actual flow), and measurement is independent of density, temperature and pressure of the medium.

SpiraMAG® Series is a preferable solution for measurement in a variety of applications from water and waste water industry to chemical/pharmaceutical and food/beverage industries.

Available sizes are DN 10 to DN 2000 with a number of different connections (DIN, ANSI, JIS, etc.) with nominal pressures up to PN 100. Tri-clamp, wafer and thread connections are also available. Liner materials are hard and soft rubber/ PTFE/ PFA and polyurethane.

For applications without a power supply, we offer our battery powered version, BR730, with a battery life span of 10 years with standard sampling rate.

3. MEASURING PRINCIPLE

Based on Faraday's law of magnetic induction, when a conductor moves in right angles through a magnetic field, a voltage is being induced across it, proportional to the velocity of the conductor and the magnetic flux density.

In an electromagnetic flow meter, when fluid moves as the conductor, the voltage induced within the fluid is measured by two diametrically opposed electrodes. This allows the Magnetic-

inductive flow meter to detect flow velocity of fluid inside a closed conduit. Electromagnetic flow meters are able to measure a wide range of fluid velocities, however, meter sizes shall be selected properly based on the application and flow conditions to reach the best possible accuracy.

4. FEATURES

- DN 10 – DN 1200 (up to DN 2000 on request)
- Accuracy better than $\pm 0,25\%$
- Flow Range 0,03 to 12 m/s
- Protection Class IP65/ IP67/ IP68
- Compact / Remote convertor
- Power supply 220VDC/ 24 VAC/ Battery
- Up to PN 100
- Analogue 4-20 mA output
- Frequency output/ Pulse
- Interface: HART/ Modbus R485/ M-Bus

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Technical Data

Sensor

Size	DN 10-DN 1200, Larger sizes on request
Connections	Flange: DIN, ANSI, JIS. Wafer Connection, Tri-Clamp, Wafer Customized connections by orderrequest
Protection Class	IP67 (Optional IP68)
Nominal Pressure	Up to PN 100
Working Temperature	- 20 to + 60 °C (- 40 to + 150 °C with PTFE)
Electrode Material	SS 316, Hastelloy C, Others on request
Liner Material	Hard/Soft Rubber/ PTFE
Measuring Tube Material	SS 316
Housing	Carbon Steel / Optional Stainless Steel
Lay length	Std. acc. ISO 13359, Others by order

Convertor

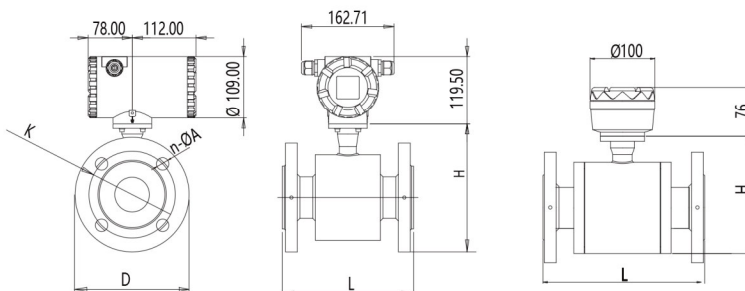
Type	Convertors Model BR720/BR730
Size	DN 10-DN 1200, Larger sizes on request
Flow Direction	Bi - Directional
Accuracy	± 0,25 % of actual flow
Repeatability	0,1 %
Conductivity	≥ 5 µS/cm
Ambient temperature	- 20 to + 70 °C, Relative Humidity 90%
Power supply	85-265 VAC (50/60 Hz) / 9-36 VDC / Battery
Flow Range	0,03 - 12 m/s
Analogue Output	4 - 20 mA
Digital Output	Frequency output/ Pulse (Active)
Empty pipe detection	YES
Communication	RS485 or HART Protocol
Display	7 Digits flow rate/ 8 digits totalizer/ LCD
Housing	Aluminum IP65/IP67 (Optional IP68)
Remote version	Up to 100 m with standard junction box

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6. DIMENSIONS

mm							
DN (mm)	Max Working pressure (bar)	L	D	K	n-ØA	Compact type (kg)	Remote type (kg)
10	40	150	90	60	4-Ø14	6	4
15		150	95	65	4-Ø14	6	4
20		150	105	75	4-Ø14	6	4
25		150	115	85	4-Ø14	7	5
32		150	140	100	4-Ø18	9	7
40		150	150	110	4-Ø18	10	8
50		200	165	125	4-Ø18	12	10
65		200	185	145	8-Ø18	17	15
80	200	200	160	8-Ø18	17	15	
100	16	250	220	180	8-Ø18	22	20
125		250	250	210	8-Ø18	24	22
150		300	285	240	8-Ø22	35	33
200	10	350	340	295	8-Ø22	45	43
250		400	395	350	12-Ø22	84	82
300		500	445	400	12-Ø22	102	100
350		500	505	460	16-Ø22	123	121
400		600	565	515	16-Ø26	147	145
450		600	615	565	20-Ø26	212	207
500		600	670	620	20-Ø26	229	210
600		600	780	725	20-Ø30	252	250
700		700	895	840	24-Ø30	352	350
800		800	1015	950	24-Ø33	462	460
900	900	1115	1050	28-Ø33	558	550	
1000	6	1000	1235	1120	28-Ø36	690	680
1200		1200	1405	1340	32-Ø33	785	780
1400		1400	1630	1560	36-Ø36	1258	1250



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7. ORDERING MATRIX

	BR								
INSTALLATION									
BR720(220VAC – Compact version)	A1								
BR720(24VDC – Compact version)	A2								
BR730(Battery – Compact version)	A3								
BR720(220VAC – Remote version)	B1								
BR720(24VDC – compact version)	B2								
BR730(Battery – Remote version)	B3								
CABLE LENGTH FOR REMOTE VERSION									
10m		10							
Other		XX							
FLANGE STANDARD									
PN10			2						
PN16			3						
PN25			4						
PN40			5						
ANSI 150 #RF			7						
JIS 10K #RF			8						
Other			9						
FLANGE MATERIAL									
Carbon Steel				A					
SST 304				B					
SST 316				C					
Other				X					
SENSOR DIAMETER									
DN(10-2000)									
ELECTRODE MATERIAL									
316L						L			
Hc						C			
Hb						B			
Ti						T			
Pt						P			
Ta						A			
LINER MATERIAL									
Soft rubber							1		
Hard rubber							2		
PTFE							3		
Polyurethane							4		
PFA							5		
CONVERTOR PROTECTION									
IP65								1	
IP67								2	
IP68 (On request)								3	
OUTPUTS									
4-20 mA / Pulse									A
4-20 mA/ Pulse/ RS485									R
4-20 mA/ Pulse/ HART									H
Pulse/RS485 (Battery version)									P

EXAMPLE: BR B1 10 3 A 200 C 1 2 A

- Customized Cable length/Connections/ Flange material shall be ordered separately.
- Grounding Method (Grounding electrode or Grounding ring) shall be ordered separately.

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8. FLOW CHARACTERISTIC VALUES BY PIPE SIZE

Nominal Diameter		Recommended flow Min/Max full scale value Velocity ~ 0.3 – 10 m/s	
[mm]	[Inch]		
15	½	4 to 100	l/min
20	-	6 to 200	l/min
25	1	9 to 300	l/min
32	-	15 to 500	l/min
40	1 ¼	25 to 700	l/min
50	2	2.1 to 66	m³/h
65	-	3.6 to 120	m³/h
80	3	5.4 to 180	m³/h
100	4	8.7 to 282	m³/h
125	5	13.2 to 450	m³/h
150	6	20 to 600	m³/h
200	8	35 to 1100	m³/h
250	10	55 to 1700	m³/h
300	12	80 to 2400	m³/h
350	14	110 to 3300	m³/h
400	16	140 to 4200	m³/h
500	20	220 to 6600	m³/h
600	24	310 to 9600	m³/h
700	28	410 to 12000	m³/h
800	32	560 to 16000	m³/h
900	36	800 to 17500	m³/h
1000	40	1200 to 20000	m³/h