Issue May 2003

Metal Tube Variable Area Flowmeter

BGN Introduction

The BGN range of metal tube variable area flowmeters has been designed for those applications where conventional glass tube instruments may not be used on account of high pressures or liquid opacity, or for safety considerations when metering hazardous chemicals.

As opposed to the 'fixed float diameter tapered tube' principle used in conventional variable area meters, the BGN utilises a fixed sharp edged orifice and tapered profiled float, the float profile being machined to exacting standards to ensure a linear scaling.

Operating pressures are largely limited only by the flange ratings, and elevated temperature operation is possible by extending the indicator coupling to remove the indicator and associated electrical or pneumatic transmitters from the source of heat.

Large scale production and exacting machining specifications enable all parts of the flowmeter to be mechanically interchangeable within a specific range size, and range conversions and replacement of indicators can be carried out by any skilled engineer without difficulty.

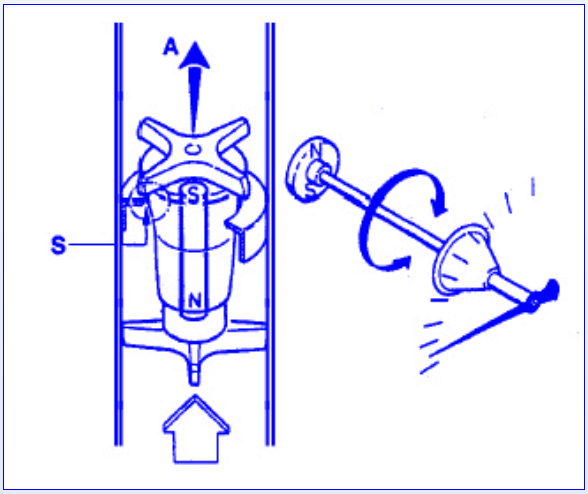
Electrical transmitting system, or high and low alarm contact devices may be fitted in minutes within the indicator housing.

Operating principle

The measuring system comprises a sharp edged fixed orifice ring, and a tapered float.

When the fluid flows vertically upwards, the float rises until a point of equilibrium is reached where the weight of the float is balanced by the buoyancy force 'A'.

This results in an annulus 'S' the area of which is directly proportional to the flowrate.
The vertical movement of the float is transmitted to an external indicator through a magnetic coupling system such that glands and seals are avoided.



Advantages

- ⇒ **Simple robust and low maintenance all metal design.**
- ⇒ **High pressure and temperature resistance.**
- ⇒ **Suitable for steam tracing.**
- ⇒ **Linear flow indicator and output signals.**
- ⇒ **Short length of 250 mm enables versatile application in all industries.**
- ⇒ **Four interchangeable standard indicator systems.**

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BGN Sizing table

	No.	Water l/hr 20°C	Air M3/hr 1.013 bar 20°C	P max mbar	Meter Availability Type 120	Type 170
1/2"	1	0.5-5	0.015-0.15	40		
	2	1.0-10	0.030-0.30	40		
	3	1.6-16	0.048-0.48	40		
	4	2.5-25	0.075-0.75	40	•	
	5	5.0-50	0.150-1.50	40	•	
	6	7.0-70	0.210-2.10	40		
	7	10-100	0.3-3	60	•	
	8	16-160	0.46-4.6	60	•	
3/4"	9	25-250	0.7-7	60	•	
	10	40-400	1.1-11	70	•	
	11	60-600	1.7-17	80	•	
	12	100-1000	2.9-29	60		
	13	160-1600	4.6-46	70		
	14	250-2500	7.1-71	100		
1"	1	0.5-5	0.015-0.15	40		
	2	1.0-10	0.030-0.30	40		
	3	1.6-16	0.048-0.48	40		
	4	2.5-25	0.075-0.75	40		
	5	5.0-50	0.150-1.50	40		
	6	7.0-70	0.210-2.10	40		
	7	10-100	0.3-3	60		
	8	16-160	0.46-4.6	60		
	9	25-250	0.7-7	60	•	
	10	40-400	1.1-11	70	•	
	11	60-600	1.7-17	80	•	
	12	100-1000	2.9-29	60	•	
	13	160-1600	4.6-46	70	•	
	14	250-2500	7.1-71	100	•	
	15	400-4000	11-110	240	•	
2"	12	100-1000	2.9-29	60	•	
	13	160-1600	4.6-46	70	•	
	14	250-2500	7.1-71	110	•	
	15	400-4000	11-110	80	•	
	16	600-6000	17-170	90	•	
	17	1000-10000	29-290	110	•	
	18	1600-16000	46-460	230	•	
	19	2500-25000	71-710	500	•	
3"	15	400-4000	11-110	80	•	
	16	600-6000	17-170	90	•	
	17	1000-10000	29-290	110	•	
	18	1600-16000	46-460	70	•	
	19	2500-25000	71-710	100		
	20	4000-40000	110-1100	350		
4"	18	1600-16000	46-460	70	•	
	19	2500-25000	71-710	100	•	
	20	4000-40000	110-1100	120		
	21	6000-60000	170-1700	360		

• Indicates floats are interchangeable with tubes in marked size range.

Shaded flow range figures indicates meters are usually available ex-stock.
Other sizes approx. 6-8 weeks delivery. For details refer to head office.

Parts and materials

BGN 120

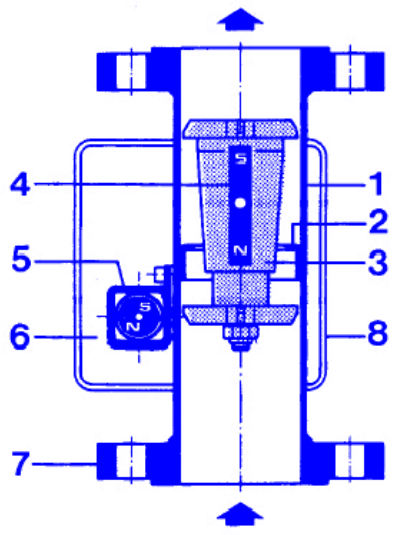
All contact parts in 316 st/stl

	Part	Material
1	Body	316 st/stl
2	Measuring ring	316 st/stl
3	Float	316 st/stl
4	Magnet	"Oerstit"
5	Following magnet	"Oerstit"
6	Indicator housing	Aluminium
7	Flanges	316 st/stl
8	Cover	Aluminium

BGN 170

All contact parts in PTFE

	Part	Material
1	Body	316 st/stl
2	Body Lining and ring	PTFE
3	Float	PTFE
4	Magnet	"Oerstit"
5	Following magnet	"Oerstit"
6	Indicator housing	Aluminium
7	Flanges	316 st/stl
8	Cover	Ultramid



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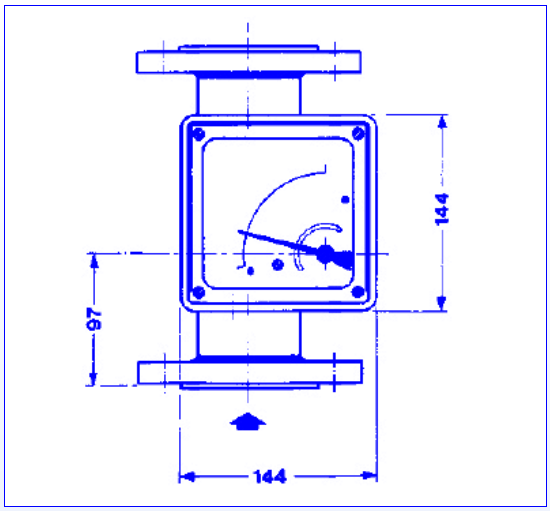
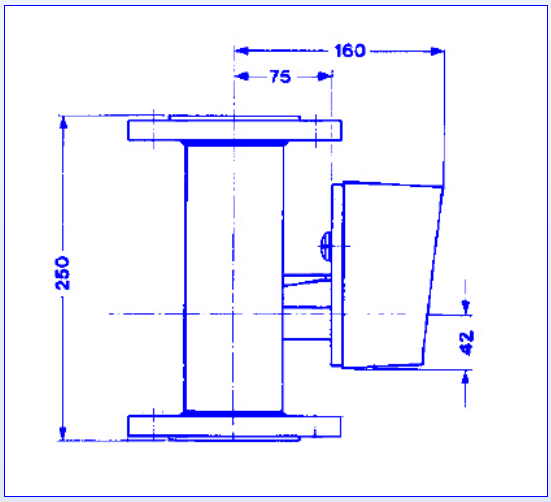
BGN Technical data Dimensions

Standard Flanges	ANSI 150
Ranges	DIN, BS 1560
Pressure Rating	As flange rating
Installation	Vertical, with flow upwards
Length	250mm
Measuring Span	10-1
Scale length	100 mm
Accuracy	±2% of full scale ±1.5% of full scale at extra cost
Temperature Rating	-50°C to 200°C standard higher temp. on request
Ambient	-40°C to +80°C
Weatherproofing	To IP 65 standards
Steam Jacket	May be supplied to special order





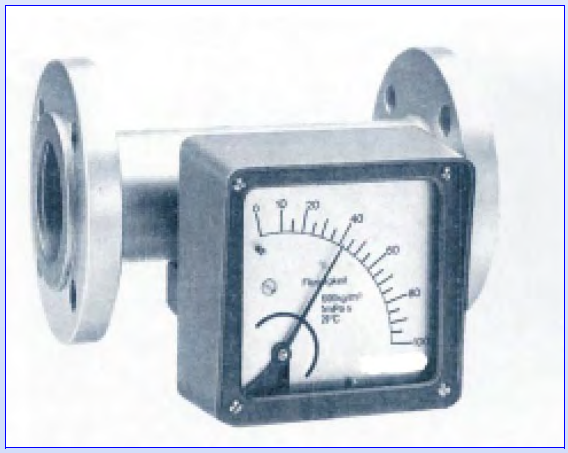
Installation and use

The meter must be mounted vertically in the pipeline with the direction of flow from bottom to top. The rugged construction and light weight permits the unit to be supported by the surrounding pipework and under normal circumstances no additional bracketing is required.

For liquids, valves of any type may be installed up or downstream of the meter without affecting accuracy. For gas measurements however, valves should be installed downstream of the unit. When opening valves, care should be taken to open slowly since hammer of the float against the tube stop may cause damage-

Since all contact parts are in 316 stainless steel or PTFE the BGN may be used on a wide range of corrosive fluids and the sharp edged orifice enables its use on liquids containing fine particles.

For application where the direction of flow is other than vertically upwards, spring restrained meter type BGF is available.



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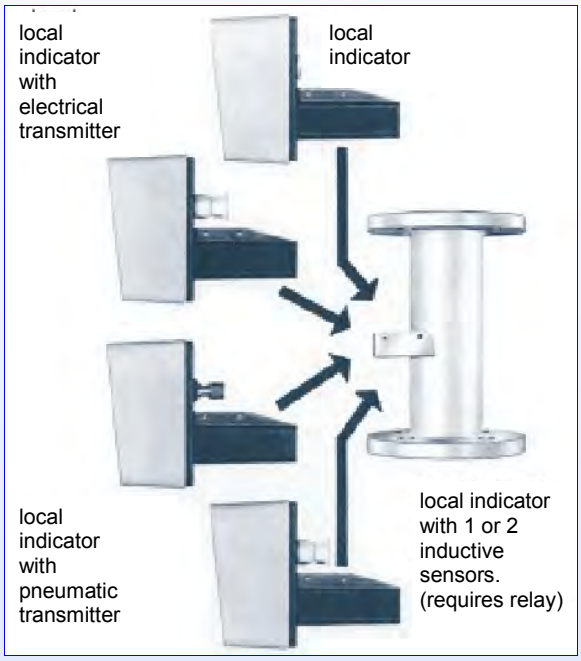
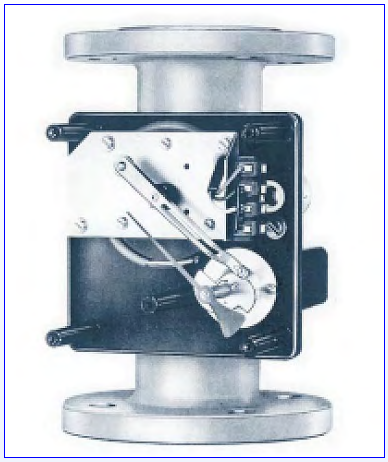
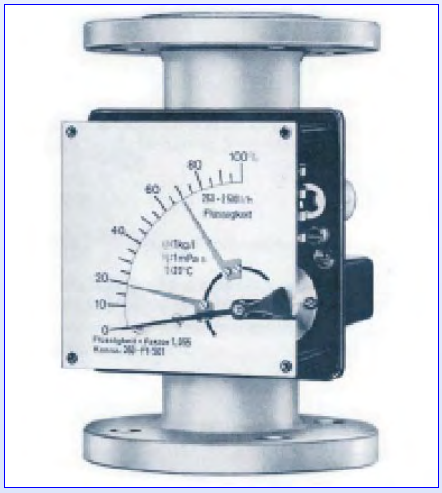
BGN Optional equipment

Various transmitters may be fitted into the indicator housing for remote indication of flowrate or high/low alarm sensors. Electrical or pneumatic transmitters are available. Suitable for hazardous areas, these units are described in further detail in a separate leaflet.





BGN Fitted with Electrical transmitter type “E”



BGN Fitted with high/low flow alarm sensors type “KEI 2”

Electrical or Pneumatic transmitter may be easily fitted into standard indicator housing

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