### **All-Metal Armored Flowmeter and Counter**

for Liquids and Gases



measuring
•
monitoring
•
analyzing

**BGN** 













- 316 Stainless Steel, PTFE-Lined Stainless Steel, and Hastelloy<sup>®</sup> C-22 Measuring Tubes
- Line Sizes up to 6"
- Direct Reading Scales Calibrated for Media Viscosity, Density, Operating Pressure and Temperature
- Analog Output, HART®, and Profibus®-PA
- Connection: 1/4"...2" NPT, ANSI 1/2"...6", Others Available
- Special Versions Available for Process Temperatures up to 660 °F
- Special Materials: Monel<sup>®</sup>, Tantalum, Others on Request



KOBOLD companies worldwide:

622 Mary Street; Suite 101; Warminster, PA 18974 Phone: 267-673-8117 - Fax: 267-673-8118 Sales@cabriggs.com - www.cabriggs.com

# OBOLD

#### All-Metal Armored Flowmeter and Counter Model BGN

#### **Description**

The KOBOLD BGN armored variable area flowmeter is ideal for difficult applications that require high pressure capability, high temperature operation, or low pressure loss. The BGN's standard design is available in stainless steel, PTFE-clad stainless steel, or Hastelloy® C-22. The standard BGN is well suited for water, most viscous liquids, and compressed gases in line sizes up to 6". The direct reading scales are calibrated for media viscosity, density, operating pressure, and temperature. Electronic limit switches and an analog flow transmitter are available as options and are able to operate via intrinsically safe methods of protection and may be used in hazardous areas where intrinsically safe installations are permitted. Custom designs for high pressure, high temperature, special fittings, and special materials (such as Monel® and tantalum) are available. Other options include: self-draining flow bodies, gas or liquid damping, and a flow counter module.

#### **Technical Details**

Sensor

Wetted Materials: 316 L SS / 316-Ti SS,

Hastelloy® C-22/C4, PTFE Other Materials on Request

**Process Connection:** ASME B16.5, NPT,

Other Connections on Request

Nominal Pressure: 580 PSIG, ASME Cl150 / 300

(Standard) (BGN-S/H) 230 PSIG, ASME CI150 (Standard) (BGN-P)

Higher Pressures Upon Request

(Max. 8700 PSIG)

Process Temperature: -40...392°F

(BGN-S/H without Electr. Output)

-40...300°F

(BGN-S/H with Electr. Output)

-40...660 °F

(BGN-S/H with Option V / H / W)

-40...257°F (BGN-P)

Ambient Temperature: -40...176 °F

Accuracy

**Liquid:**  $\pm 1.6\%$  of Full Scale (BGN-S/H)

 $\pm 2.0\,\%$  of Full Scale (BGN-P)

**Gas:**  $\pm 1.8\%$  of Full Scale (BGN-S/H)

±2.2% of Full Scale (BGN-P)

Additional Inaccuracy

with Transmitter (ES):  $\pm 0.2\%$ 

Repeatability: ±0.5% of Full Scale

Protection: IP 65 (Aluminum Housing)
IP 67 (Stainless Steel Housing)

Certification

2

**Explosion Protection:** BVS 03 ATEX H/B 112 **CE-Marking:** Pressure Equipment Directive

97/23/Eg



Display

Material: Aluminum (Stove-Enameled)

Stainless Steel (as Option)

Electrical Outputs: Inductive Switch,

SJ 3,5-N NAMUR (Standard)\*

Inductive Switch,

SJ 3,5-SN NAMUR (Safety Design)\* on Request

Microswitch\*

Others on Request

Ambient Temperature: -40...176°F

(without Limit Switch)

-40...149°F (with Limit Switch)

\* Using the segments of the slot-type initiators or the eccentric discs of the microswitches, any switching point between 10 % and 90 % of the flow rate can be set

#### Transmitter

- ES with HART®-Protocol
- $\bullet$  ES with HART®-Protocol and

2 NAMUR-Switches\*

 ES with HART®-Protocol and 1 NAMUR-Switch\* / 1 Pulse Output

ES with Profibus® PA

• ES with HART®-Protocol and Counter Module

ES with Fieldbus® Foundation™

\* Contact can be configured using HART®

Power Supply:  $14 - 30 V_{DC}$ 

Output: Passive, Galvanically Isolated

Current: 4-20 mA

**Binary 1 and 2:**  $U_i = 30 \text{ V}, I_i = 20 \text{ mA}, P_i = 100 \text{ mW}$ 

Input Binary: Counter Reset

(only for ES with Counter Module)

Ambient Temperature: -40...158°F

Certification

**Explosion Protection:** DMT 00 ATEX E 075 **Type of Protection:** ⟨€∞⟩ II 2G EEx ia IIC T6

**CE-Marking:** Explosion Protection Directive

94/9/EG



#### Order Details for Low Flow Models: (Example: BGN-S10 201R A 0000 S 1 0 0K)

Low Flow Models							
		Measuring Ranges: 0.00220	).022 GF	M to 0.01760.176 GPM		Part Number	
Model	Measuring Tube	Connection		Measuring Range	*	Continued	
Wiodei	Material	Connection	Code	Water	Air		
		201R <sup>5)</sup> 11) = 1/2" Class 150 RF ASME	A	BGN-S10: 0.00220.022 GPM BGN-P10: 0.00310.031 GPM	0.0080.08 SCFM		
	S10 = Stainless Steel, Process Temp. ≤ 660 °F	221R <sup>5)11)</sup> = 1/2" Class 300 RF ASME 202R = 3/4" Class 150	B	BGN-S10: 0.00440.044 GPM BGN-P10: 0.00530.053 GPM	0.0180.18 SCFM	To complete	
BGN		RF ASME222R <sup>1)</sup> = 3/4" Class 300	C	BGN-S10: 0.00710.071 GPM BGN-P10: 0.00880.088 GPM	0.0850.282 SCFM	part number, please go	
		RF ASME203R = 1" Class 150 RF ASME	D <sup>5)</sup>	0.0110.11 GPM	0.0440.44 SCFM	order table on page 7.	
		223R <sup>1)</sup> = 1" Class 300 RF ASME	E <sup>5)</sup>	0.01760.176 GPM	0.0770.77 SCFM		

<sup>\*</sup>Reference Conditions: Water at 68 °F @1 mPas, Air at 68 °F @ 0 PSIG (Range Values for Other Media Upon Request)

#### Order Details for DN15 Models: (Example: BGN-S15 201R F 0000 S 1 0 0K)

DN15 Models						
		Measuring Ranges: 0.0220.22 GPM to 0.26	42.64 GF	PM		Part Number
Model	Measuring Tube	Connection		Measuring Ra	nge*	Continued
Wiodei	Material	Connection	Code	Water	Air	
	S15 = Stainless Steel, Process Temp.	201R <sup>5)11)</sup> = 1/2" Class 150 RF ASME	F	0.0220.22 GPM	0.0880.88 SCFM	
	≤ 660 °F P15 = Stainless Steel     Measuring Tube,     PTFE-Lining,     Process Temp.     ≤ 257 °F,     Max. Pressure     230 PSIG H15 = Hastelloy® C-22,	.221R <sup>5)</sup> 11) = 1/2" Class 300 RF ASME .202R = 3/4" Class 150 RF ASME .222R <sup>1)</sup> = 3/4" Class 300 RF ASME	G	0.0310.31 GPM	0.1181.24 SCFM	_
			H	0.0440.44 GPM	0.1761.76 SCFM	To complete part
BGN		203R = 1" Class 150 RF ASME 223R <sup>1)</sup> = 1" Class 300 RF ASME	l	0.0710.71 GPM	0.2942.71 SCFM	number, please go directly to
		6010 <sup>5) 6)</sup> = 1/4" NPT 6020 <sup>5) 6)</sup> = 3/8" NPT	J	0.111.1 GPM	0.4124.12 SCFM	order table on page 7.
		6030 <sup>5) 6)</sup> = 1/2" NPT 6040 <sup>5) 6)</sup> = 3/4" NPT	K	0.1761.76 GPM	0.5896.47 SCFM	
	Process Temp. ≤ 660 °F		L	0.2642.64 GPM	1.010.0 SCFM	

 $<sup>{}^*\</sup>text{Reference Conditions: Water at 68 °F @1 mPas, Air at 68 °F @ 0 PSIG (Range Values for Other Media Upon Request)}$ 

 $<sup>^{\</sup>mbox{\tiny 1)}}$  Pressure stated for models BGN-S and BGN-H

<sup>&</sup>lt;sup>2)</sup> Damping / spring not available

<sup>3)</sup> Only available with forward advanced indicating housing

<sup>4)</sup> Not available with heating / cooling

<sup>5)</sup> Not for model BGN-P

<sup>6)</sup> Not for model BGN-H

<sup>7)</sup> Not for model BGN-S

<sup>9)</sup> Cannot be converted for other media

 $<sup>^{\</sup>mbox{\scriptsize 10)}}$  IEC 61508-2:2010 conformity confirmed by EXIDA

<sup>11)</sup> Reduced rasied face



#### Order Details for DN25 Models: (Example: BGN-S25 202R M 0000 S 1 0 0K)

DN25 Models						
		Measuring Ranges: 0.444.4 GPM to 1.76	17.6 GPM			Part Number
Model	Measuring Tube	Connection		Measuring Ra	nge*	Continued
Model	Material	Connection	Code	Water	Air	
	S25 = Stainless Steel, Process Temp. ≤ 660 °F	202R <sup>5) 11)</sup> = 3/4" Class 150 RF ASME 222R <sup>5) 11)</sup> = 3/4" Class 300 RF ASME	M	0.444.4 GPM	1.7617.6 SCFM	
BGN	P25 = Stainless Steel  Measuring Tube, PTFE-Lining, Process Temp.	203R = 1" Class 150 RF ASME 223R1) = 1" Class 300 RF ASME	N	0.7057.05 GPM	2.3527.1 SCFM	To complete part number,
Baiv	≤ 257 °F, Max. Pressure 230 PSIG	6010 <sup>5) 6)</sup> = 1/4" NPT 6020 <sup>5) 6)</sup> = 3/8" NPT	P	1.111 GPM	4.1241.2 SCFM	please go directly to order table on page 7.
	H25 = Hastelloy® C-22, Process Temp. ≤ 660 °F	6030 <sup>5) 6)</sup> = 1/2" NPT 6040 <sup>5) 6)</sup> = 3/4" NPT	Q <sup>5)9)</sup>	1.7617.6 GPM	6.4764.7 SCFM	

<sup>\*</sup>Reference Conditions: Water at 68 °F @1 mPas, Air at 68 °F @ 0 PSIG (Range Values for Other Media Upon Request)

#### Order Details for DN40 Models: (Example: BGN-S40 205R P 0000 S 1 0 0K)

	DN40 Models						
		Measuring Ranges: 1.111 GPM to 2.64	.26.4 GPM			Part Number	
Model	Measuring Tube	Connection		Measuring Ra	nge*	Continued	
Wiodei	Material	Connection	Code	Water	Air		
	S40 = Stainless Steel, Process Temp. ≤ 660 °F		P	1.111 GPM	4.1241.2 SCFM		
	P40 = Stainless Steel	205R <sup>5</sup> ) = 1-1/2" Class 150 RF ASME				То	
BGN	Measuring Tube, PTFE-Lining, Process Temp. ≤ 257 °F,	225R <sup>1) 5)</sup> = 1-1/2" Class 300 RF ASME 6040 <sup>5) 6)</sup> = 3/4" NPT	Q	1.7617.6 GPM	6.4764.7 SCFM	complete part number, please go directly to	
	Max. Pressure 230 PSIG H40 = Hastelloy® C-22, Process Temp. ≤ 660 °F	6050 <sup>5)</sup> 6) = 1" NPT 6060 <sup>5)</sup> 6) = 1-1/4" NPT	R	2.6426.4 GPM	10100 SCFM	order table on page 7.	

 $<sup>{}^*\!</sup>Reference\ Conditions:\ Water\ at\ 68\ {}^\circ\!F\ @\ 1\ mPas,\ Air\ at\ 68\ {}^\circ\!F\ @\ 0\ PSIG\ (Range\ Values\ for\ Other\ Media\ Upon\ Request)$ 

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<sup>1)</sup> Pressure stated for models BGN-S and BGN-H

<sup>&</sup>lt;sup>2)</sup> Damping / spring not available

<sup>&</sup>lt;sup>3)</sup>Only available with forward advanced indicating housing

<sup>4)</sup> Not available with heating / cooling

<sup>5)</sup> Not for model BGN-P

<sup>6)</sup> Not for model BGN-H

<sup>7)</sup> Not for model BGN-S

<sup>9)</sup> Cannot be converted for other media

<sup>10)</sup> IEC 61508-2:2010 conformity confirmed by EXIDA

<sup>11)</sup> Reduced raised face



#### Order Details for DN50 Models: (Example: BGN-S50 206R Q 0000 S 1 0 0K)

	DN50 Models						
		Measuring Ranges: 1.7617.6 GPM to 11	110 GPM			Part Number	
Model	Measuring Tube	Connection		Measuring Ra	nge*	Continued	
Woder	Material	Connection	Code	Water	Air		
	S50 = Stainless Steel, Process Temp. ≤ 660 °F		Q	1.7617.6 GPM	6.4764.7 SCFM		
	P50 = Stainless Steel Measuring Tube, PTFE-Lining,	206R = 2" Class 150 RF ASME 226R <sup>1)</sup> = 2" Class 300 RF ASME 6070 <sup>5) 6)</sup> = 1-1/2" NPT 6080 <sup>5) 6)</sup> = 2" NPT	R	2.6426.4 GPM	10100 SCFM	To complete part	
BGN	Process Temp. ≤ 257 °F,		S	4.444 GPM	17.07170.7 SCFM	number, please go directly to	
	Max. Pressure 230 PSIG		Т	7.0570.5 GPM	27.07270.7 SCFM	order table on page 7.	
	H50 = Hastelloy® C-22, Process Temp. ≤ 660 °F		U <sup>5)9)</sup>	11110 GPM	41.19411.9 SCFM		

<sup>\*</sup>Reference Conditions: Water at 68 °F @1 mPas, Air at 68 °F @ 0 PSIG (Range Values for Other Media Upon Request)

#### Order Details for DN80 Models: (Example: BGN-S80 208R T 0000 S 1 0 0K)

	DN80 Models						
		Measuring Ranges: 7.0570.5 GPM to 17	7.61176.1	GPM		Part Number	
Model	Measuring Tube	Connection		Measuring Ran	ge*	Continued	
Model	Material	Connection	Code	Water	Air		
BGN	S80 = Stainless Steel, Process Temp. ≤ 660 °F P80 = Stainless Steel Measuring Tube, PTFE-Lining, Process Temp. ≤ 257 °F, Max. Pressure	208R = 3" Class 150 RF ASME 228R <sup>1)</sup> = 3" Class 300 RF ASME	T	7.0570.5 GPM 11110 GPM	27.07270.7 SCFM 41.19411.9 SCFM	directly to	
	230 PSIG H80 = Hastelloy® C-22, Process Temp. ≤ 660 °F		<b>V</b> <sup>5)</sup>	17.61176.1 GPM	64.74647.4 SCFM	order table on page 7.	

<sup>\*</sup>Reference Conditions: Water at 68°F @1 mPas, Air at 68°F @ 0 PSIG (Range Values for Other Media Upon Request)

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<sup>1)</sup> Pressure stated for models BGN-S and BGN-H

<sup>&</sup>lt;sup>2)</sup> Damping / spring not available

<sup>3)</sup> Only available with forward advanced indicating housing

<sup>4)</sup> Not available with heating / cooling

<sup>5)</sup> Not for model BGN-P

<sup>&</sup>lt;sup>6)</sup> Not for model BGN-H

<sup>7)</sup> Not for model BGN-S

<sup>9)</sup> Cannot be converted for other media

<sup>10)</sup> IEC 61508-2:2010 conformity confirmed by EXIDA



#### Order Details for DN100 Models: (Example: BGN-S1H 210R V 0000 S 1 0 0K)

	DN100 Models							
		Measuring Ranges: 17.61176.1 GPM	1 to 44.03	440.3 GPM		Part		
Model	Measuring Tube	Connection		Measuring Range*		Number Continued		
Model	Material	Connection	Code	Water	Air			
	S1H = Stainless Steel, Process Temp. ≤ 660 °F		V	17.61176.1	64.74647.4			
DOM	P1H = Stainless Steel Measuring Tube, PTFE-Lining,	210R = 4" Class 150 RF ASME	W	BGN-S/H: 26.42264.2 GPM BGN-P: 24.21242.1 GPM	on Request	To complete part number,		
BGN	Process Temp. ≤ 257 °F, Max. Pressure 230 PSIG	230R <sup>1)3)11)</sup> = 4" Class 300 RF ASME	X <sup>5)</sup>	35.23352.3 GPM	on Request	please go directly to order table on page 7.		
	H1H = Hastelloy® C-22, Process Temp. ≤ 660 °F		2 <sup>2)5)</sup>	44.03440.3 GPM	on Request			

<sup>\*</sup>Reference Conditions: Water at 68 °F @1 mPas, Air at 68 °F @ 0 PSIG (Range Values for Other Media Upon Request)

#### Order Details for DN150 Models: (Example: BGN-SH5 212R 2 0000 V 1 0 0K)

	<b>DN150 Models</b> Measuring Ranges: 17.61176.1 GPM to 44.03440.3 GPM						
	Measuring Tube		10 44.004	Measuring Range*		Number Continued	
Model	Material	Connection	Code	Water	Air		
BON	SH5 = Stainless Steel, Process Temp. ≤ 660 °F	212R <sup>11)</sup> = 6" Class 150 RF ASME	2 <sup>5)</sup>	44.03440.3 GPM	on Request	To complete part number,	
BGN	HH5 = Hastelloy® C-22, Process Temp. ≤ 660 °F	232R <sup>3)11)</sup> = 6" Class 300 RF ASME	4 <sup>5)</sup>	57.24572.2 GPM	on Request	please go directly to order table on page 7.	

<sup>\*</sup>Reference Conditions: Water at 68 °F @1 mPas, Air at 68 °F @ 0 PSIG (Range Values for Other Media Upon Request)

<sup>1)</sup> Pressure stated for models BGN-S and BGN-H

<sup>2)</sup> Damping / spring not available

<sup>&</sup>lt;sup>3)</sup> Only available with forward advanced indicating housing

<sup>4)</sup> Not available with heating / cooling

<sup>5)</sup> Not for model BGN-P

<sup>6)</sup> Not for model BGN-H

<sup>7)</sup> Not for model BGN-S

<sup>9)</sup> Cannot be converted for other media

<sup>&</sup>lt;sup>10)</sup> IEC 61508-2:2010 conformity confirmed by EXIDA

<sup>11)</sup> Models from 4" Class 300 and up require selection of display "assembled at distance". Choose display option codes: "V", "H", or "W"



#### Order Details\*\* Continued (Example: BGN-S 10201R A 0000 S 1 0 0K)

Heating <sup>5)</sup> / Cooling	Damping <sup>5)</sup> / Spring Stop	Draining Body	Certificates	Display	Scale	Electrical Output	Accessories
0 = without 3 = with Heating ANSI- Flange ½" Class 150 4 = with Heating 1/2" NPT Conn.	0 = without R <sup>8</sup> = with Flow Restrictor for Gas Measuring F <sup>11</sup> = with Liquid Damping G <sup>11</sup> = with Gas Damping A <sup>11</sup> = with Gas Damping Stop S <sup>11</sup> = with Gas Damping Stop	0 = without L <sup>12</sup> = with Self Draining Body	0 = without Certificate 1 = Certificate of Compliance with the Order 2.1 2 = Test Report 2.2 B = Inspection Certificate with Material Certificate 3.1 C = Inspection Certificate with Material Certificate 3.2	V = Aluminum, Assembled at Distance, up to 660°F E <sup>13</sup> = Stainless SteelH = Stainless Steel, Assembled at Distance, up to 660°F T <sup>13</sup> = Aluminum with Pressure Compensation W = Aluminum with Pressure Compensation, Assembled at Distance, up to 660°F	Water1 = %-Scale2 = Measuring Range  Media4 = %-Scale5 = Measuring Range  **Please specify media data in plain text (see below)	0 = without 1 = 1 Inductive Limit Switch, SIL-1 <sup>1(0)</sup> 2 = 2 Inductive Limit Switches, SIL-1 <sup>1(0)</sup> C = 1 Micro Switches 6 = Transmitter ES with HART®, EEX ia, 4-20 mA, SIL-1 <sup>9)</sup> 7 = Transmitter ES with HART®, EEX ia, 4-20 mA and 2 NAMUR- Switches, SIL-1 <sup>1(0)</sup> 8 = Transmitter ES with HART®, EEX ia, 4-20 mA, 1 NAMUR- Switch and 1 Pulse Output, SIL-1 <sup>1(0)</sup> 9 = Electrical Transmitter ES with Profibus® PA, EEX ia I = 4-20 mA with HART® and Counter Module K = Electrical Transmitter ES with Fieldbus® Foundation™	0K = WithoutXK = Special (Please Specify)

<sup>1)</sup> Pressure stated for models BGN-S and BGN-H

#### \*Additional Information Required for Order:

To ensure proper operation, this product requires a completed application guide form to be submitted with any order. Please refer to the 'documentation' tab on the bottom of the product page for this product on our website in order to obtain the correct form. You can also contact your KOBOLD representative for this form.

<sup>&</sup>lt;sup>2)</sup> Damping / spring not available

<sup>3)</sup> Only available with forward advanced indicating housing

<sup>4)</sup> Not available with heating / cooling

<sup>5)</sup> Not for model BGN-P

<sup>6)</sup> Not for model BGN-H

<sup>7)</sup> Not for model BGN-S

<sup>8)</sup> Only available up to range code "E" (0.077...0.77 SCFM)

<sup>9)</sup> Cannot be converted for other media

<sup>10)</sup> IEC 61508-2:2010 conformity confirmed by EXIDA

<sup>11)</sup> Not for "Low Flow" or DN150 (6") models

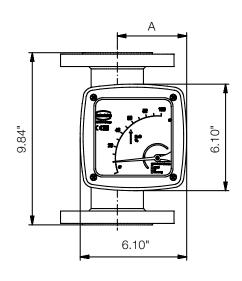
<sup>12)</sup> Not for "Low Flow" models

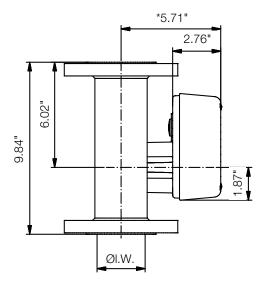
<sup>13)</sup> Not for DN100 4" with 300lb ANSI, all DN100 5" ANSI, or all DN150 6" models



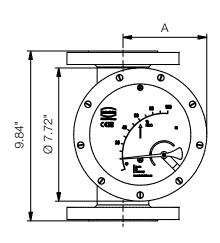


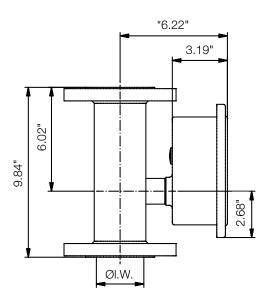
## **Dimensions**Aluminum Display





#### Stainless Steel Display





DN	PN	L M. (Impar Midth)	,	A
DIN	PN	I. W. (Inner Width)	Aluminum Display	Stainless Steel Display
15	40	1.02"	2.91"	3.94"
25	40	1.26"	3.03"	4.06"
40	40	1.81"	3.35"	4.33"
50	40	2.76"	3.86"	4.84"
80	40	4.02"	4.62"	5.51"
100	16	4.92"	5.00"	6.02"
125	16	5.91"	5.59"	6.54"
150	16	6.26"	5.83"	6.73"

Dimensional Deviations:

 $<sup>^{\</sup>star}$  + 3.94" with forward advanced display and generally at DN150