Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

All-Metal Variable Area Flowmeter and Counter

for liquids and gases

measuring • monitoring • analysing

BGN

- Measuring range: 0.5 - 5.0 ... 13 000 - 130 000 l/h water 0.015 - 0.15 ... 240 - 2 400 m³/h air (20 °C, 1.013 bar)
- Accuracy class: 1.6
- p_{max}: PN 40; t_{max}: -40 ... +350 °C
- Connection: flange DN 15 ... DN150
- Material: stainless steel 1.4404/1.4571, Hastelloy® C, PTFE
- Option: contacts, analogue output with HART®, Profibus® PA or Fieldbus® Foundation™, counter

Special versions up to 600 bar

●

Nominal diameter up to DN150

S2

KOBOLD companies worldwide:

AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHINA, CZECHIA, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, RUSSIA, SPAIN, SWITZERLAND, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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Functions

The fluid flows from bottom to top through the meter tube of the flowmeter. The float is lifted until an annular gap between the meter ring and the cone-shaped float is produced which corresponds to the flow. The forces acting on the float are in equilibrium. The forces that are mainly acting on the float comprise buoyancy according to the principle of Archimedes, the flow force of the medium and the weight force. Each position of the float corresponds to a flow value measured during calibration, which is transferred to a scale. The BGN variable area flowmeter consists of a meter tube with connections, a meter ring, and a conical float. By means of a magnet, the position of the float is transferred to an encapsulated follow magnet, which has been fitted to a pointer axle. The position of a second annular follow magnet fitted on the pointer axle is transferred to the scale by means of the pointer.

Application

The KOBOLD-BGN meter is suitable for flow measurement of liquid or gaseous products in pipes. It shows the current flow rate in volume or mass per unit in time.

Applications

Flow measurement, monitoring, adjusting and control of liquid and gaseous products. The meter's design makes it ideal for processes under difficult and rough operating conditions. The devices are available with additional electrical equipment for process monitoring and control.

- A large spectrum of wetted materials
- Magneto-resistive signal transmission
- Gas- or liquid damping (option)
- Special design for high-pressure and high-temperature applications
- Excellent heat tracing technology (option)
- Double eddy current damping (special version)
- Self draining (special version)
- Backflow stop (special version)
- Flow Controller (special version)

Technical Details

Fitting

Material:	st. st. 1.4404 (316 L) / 1.4571 (316 Ti), Hastelloy® C-22, PTFE Monel®, titanium and other special materials on request
Process connection:	Flanges acc. EN 1092-1 ASME B16.5, DIN 2512, JIS, NPT, screw pipe connection, special connections on request
Nominal pressure:	PN 40, ASME Cl150 / 300 (standard) (BGN-S/H) PN 16, ASME Cl150 (standard) (BGN-P) higher pressure rates optional (max. 600 bar)
Process temperature:	-40 °C ... +200 °C (BGN-S/H without electr. output) -40 °C ... +150 °C (BGN-S/H with electr. output) -40°C ... +350 °C (BGN-S/H with option V/ H / W) -40 °C ... +125 °C (BGN-P)
Ambient temperature:	-40 °C ... +80°C

Accuracy

Liquid:	± 1.6 % of full scale (BGN-S/H) ± 2.0 % of full scale (BGN-P)
Gas:	± 1.8 % of full scale (BGN-S/H) ± 2.2 % of full scale (BGN-P)
Additional inaccuracy through transmitter (ES):	± 0.2 %
Repeatability:	± 0.5 % of full scale

Certification

Explosion protection:	BVS 03 ATEX H/B 112
CE-Marking:	Pressure Equipment Directive 97/23/Eg
Protection:	IP 65 (aluminium housing) IP 67 (stainless steel housing)

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Technical Details (continued)

Display

Material:	aluminium (stove-enamelled) 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 °C ... +80 °C (without limit switch) -40 °C ... +65 °C (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
- 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 V, I_i = 20 mA, P_i = 100 mW
Input Binary:	Counter reset (only for ES with counter module)
Ambient temperature:	-40 °C ... +70 °C

Certification

Explosion protection:	DMT 00 ATEX E 075
Type of protection:	⟨Ex⟩ II 2G EEx ia IIC T6
CE-Marking:	Explosion Protection Directive 94/9/EG

Additional options and special versions:

- Other materials
- Other flange versions and sizes
- Certifications
- Display with pressure compensations against condensate build up
- Microswitch
- Inductive switches with safety design
- Double eddy current damping
- Self draining body
- Backflow stop
- Flow controller
- Special float for low pressure loss

Order Details for Liquids (Example: **BGN-S 10305B A 0 0 0 0 S 1 0 0K**)

Model	Measuring range water at 1000 kg/m³, 1 mPas [l/h]	Measuring range air at 20°C, 1013 mbar [Nm³/h] [11]	Connection size DN, (ASME)	Pressure stage (DIN-flange)	Max. pressure loss [mbar]	Code [2] flange DIN EN1092-1 Form B1	Code [2] flange ASME Class 150 RF
BGN-S = stainless steel measuring tube (process temperature up to 350 °C) **BGN-P** = stainless steel measuring tube, PTFE-lining (process temperature up to 125 °C) **BGN-H** = Hastelloy® measuring tube (process temperature up to 350 °C)	0.5 - 5 (0.7 - 7) [1] [4]	0.015 - 0.15	DN 15, (¾")	PN 40	40	**10305B A**	**10202R A**
	1 - 10 (1.2 - 12) [1] [4]	0.03 - 0.3	DN 15, (¾")	PN 40	40	**10305B B**	**10202R B**
	1.6 - 16 (2 - 20) [1] [4]	0.145 - 0.48	DN 15, (¾")	PN 40	40	**10305B C**	**10202R C**
	2.5 - 25 [3] [4]	0.075 - 0.75	DN 15, (¾")	PN 40	40	**10305B D**	**10202R D**
	4 - 40 [3] [4]	0.13 - 1.3	DN 15, (¾")	PN 40	40	**10305B E**	**10202R E**
	5 - 50	0.15 - 1.5	DN 15, (¾")	PN 40	40	**15305B F**	**15202R F**
	7 - 70	0.2 - 2.1	DN 15, (¾")	PN 40	40	**15305B G**	**15202R G**
	10 - 100	0.3 - 3.0	DN 15, (¾")	PN 40	60	**15305B H**	**15202R H**
	16 - 160	0.5 - 4.6	DN 15, (¾")	PN 40	60	**15305B I**	**15202R I**
	25 - 250	0.7 - 7.0	DN 15, (¾")	PN 40	60	**15305B J**	**15202R J**
	40 - 400	1.0 - 11	DN 15, (¾")	PN 40	70	**15305B K**	**15202R K**
	60 - 600	1.7 - 17	DN 15, (¾")	PN 40	80	**15305B L**	**15202R L**
	0.5 - 5 (0.7 - 7) [1] [4]	0.015 - 0.15 [1] [4]	DN 25, 1"	PN 40	40	**10309B A**	**10203R A**
	1 - 10 (1.2 - 12) [1] [4]	0.03 - 0.3 [1] [4]	DN 25, 1"	PN 40	40	**10309B B**	**10203R B**
	1.6 - 16 (2 - 20) [1] [4]	0.145 - 0.48 [1] [4]	DN 25, 1"	PN 40	40	**10309B C**	**10203R C**
	2.5 - 25 [3] [4]	0.075 - 0.75 [3] [4]	DN 25, 1"	PN 40	40	**10309B D**	**10203R D**
	4 - 40 [3] [4]	0.13 - 1.3 [3] [4]	DN 25, 1"	PN 40	40	**10309B E**	**10203R E**
	5 - 50	0.15 - 1.5	DN 25, 1"	PN 40	40	**15309B F**	**15203R F**
	7 - 70	0.2 - 2.1	DN 25, 1"	PN 40	40	**15309B G**	**15203R G**
	10 - 100	0.3 - 3.0	DN 25, 1"	PN 40	60	**15309B H**	**15203R H**
	16 - 160	0.5 - 4.6	DN 25, 1"	PN 40	60	**15309B I**	**15203R I**
	25 - 250	0.7 - 7.0	DN 25, 1"	PN 40	60	**15309B J**	**15203R J**
	40 - 400	1.0 - 11	DN 25, 1"	PN 40	70	**15309B K**	**15203R K**
	60 - 600	1.7 - 17	DN 25, 1"	PN 40	80	**15309B L**	**15203R L**
	100 - 1000	3 - 30	DN 25, 1"	PN 40	60	**25309B M** [12]	**25203R M**
	160 - 1600	4 - 46	DN 25, 1"	PN 40	70	**25309B N** [12]	**25203R N**
	250 - 2500	7 - 70	DN 25, 1"	PN 40	100	**25309B P** [12]	**25203R P**
	400 - 4000 [3] [8]	11 - 110 [3] [8]	DN 25, 1"	PN 40	240	**25309B Q** [12]	**25203R Q**
	250 - 2500	7 - 70	DN 40, 1½"	PN 40	50	**40317B P** [3]	**40205R P**
	400 - 4000	11 - 110	DN 40, 1½"	PN 40	120	**40317B Q** [3]	**40205R Q**
	600 - 6000	17 - 170	DN 40, 1½"	PN 40	180	**40317B R** [3]	**40205R R**
	400 - 4000	11 - 110	DN 50, 2"	PN 40	80	**50321B Q**	**50206R Q**
	600 - 6000	17 - 170	DN 50, 2"	PN 40	90	**50321B R**	**50206R R**
	1000 - 10000	29 - 290	DN 50, 2"	PN 40	110	**50321B S**	**50206R S**
	1600 - 16000	46 - 460	DN 50, 2"	PN 40	230	**50321B T**	**50206R T**
	2500 - 25000 [3] [8]	70 - 700 [3] [8]	DN 50, 2"	PN 40	500	**50321B U**	**50206R U**
	1600 - 16000	46 - 460	DN 80, 3"	PN 40	70	**80331B T**	**80208R T**
	2500 - 25000	70 - 700	DN 80, 3"	PN 40	100	**80331B U**	**80208R U**
	4000 - 40000 [3]	110 - 1100	DN 80, 3"	PN 40	350	**80331B V**	**80208R V**
	4000 - 40000	110 - 1100	DN 100, 4"	PN 16	120	**1H335B V**	**1H210R V**
	6000 - 60000 [3] (5500 - 55000) [1]	170 - 1700	DN 100, 4"	PN 16	360	**1H335B W**	**1H210R W**
	8000 - 80000 [3]	240 - 2400 [3]	DN 100, 4"	PN 16	600	**1H335B X**	**1H210R X**
	10000 - 100000 [3] [7]	-	DN 100, 4"	PN 16	on request	**1H335B 2**	**1H210R 2**
	4000 - 40000	110 - 1100	DN 125, 5"	PN 16	120	**1H340B V**	**1H211R V**
	6000 - 60000 [3] (5500 - 55000) [1]	170 - 1700	DN 125, 5"	PN 16	360	**1H340B W**	**1H211R W**
	8000 - 80000 [3]	240 - 2400	DN 125, 5"	PN 16	600	**1H340B X**	**1H211R X**
	10000 - 100000 [3] [7]	gas measurement not available	DN 125, 5"	PN 16	on request	**1H340B 2**	**1H211R 2**
	10000 - 100000 [3] [10]	gas measurement not available	DN 150, 6"	PN 16	on request	**H5345B 2**	**H5212R 2**
	13000 - 130000 [3] [10]	gas measurement not available	DN 150, 6"	PN 16	on request	**H5345B 4**	**H5212R 4**

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Continuation Order Details for Liquids (Example: **BGN-S 10305B A 0 0 0 0 S 1 0 0K**)

Heating[3] / cooling	Damping / spring stop	Draining body	Certificates	Display	Scale	Electrical output	Accesso-ries
0 = without **1** = with heating Ermeto 12 mm **2** = with heating DIN-flange DN15/PN40 **3** = with heating ANSI-flange ½" Class 150 **4** = with heating NPT-flange ½"	**0** = without **R** = with flow restrictor for gas measu-ring[5] **F**[13] = with liquid damping **G**[13] = with gas damping **A**[13] = with spring stop **S**[13] = with gas damping and spring stop	**0** = without **L**[14] = with self draining body	**0** = without certificate **1** = certificate of compli-ance with the order 2.1 **2** = certificate of compli-ance with the order 2.2 **B** = inspec-tion certi-ficate with material certificate 3.1 **C** = inspec-tion certi-ficate with material certificate 3.2 **N** = material certificate NACE	**S** = aluminium, up to 150 °C for electrical output, up to 200 °C for local indication **V** = aluminium, assembled at distance, up to 350 °C **E**[15] = stainless steel, up to 150 °C **H**[15] = stainless steel, assembled at distance, up to 350 °C **T** = aluminium, with pressure compens-ation, up to 150 °C for electrical output, up to 200 °C for local indication **W** = aluminium, with pressure compens-ation, assembled at distance, up to 350 °C	**Water** **1** = %-scale **2** = measu-ring range **F** = double scale (acc. customer prefer-ence **Media** **4** = %-scale **5** = measu-ring range Please specify media data in plain text (see below)	**0** = without **1** = 1 inductive limit switch, SIL-1[9] **2** = 2 inductive limit switches, SIL-1[9] **3** = 1 inductive switch (safety design), SIL-1[9] **4** = 2 inductive switches (safety design), SIL-1[9] **C** = 1 micro switch **D** = 2 micro switches **6** = transmitter ES with HART®, EEx ia, 4-20 mA, SIL-1[9] **7** = transmitter ES with HART®, EEx ia,4-20 mA and 2 NAMUR-switches, SIL-1[9] **8** = transmitter ES with HART®, EEx ia,4-20 mA, 1 NAMUR-switch and 1 pulse output, SIL-1[9] **9** = electrical transmitter ES with Profibus® PA, EEx ia **E** = 1 inductive switch (three-wire) **F** = 2 inductive switches (three-wire) **G** = 1 inductive switch NCB2-12GM40-Z0 **I**[15] = 4-20 mA with HART® and counter module **K** = electrical transmitter ES with Fieldbus® Foundation™ **X** = special	**0K** = without **XK** = special (separate specification)

Reference conditions: water 20 °C, air 1,013 bar abs.

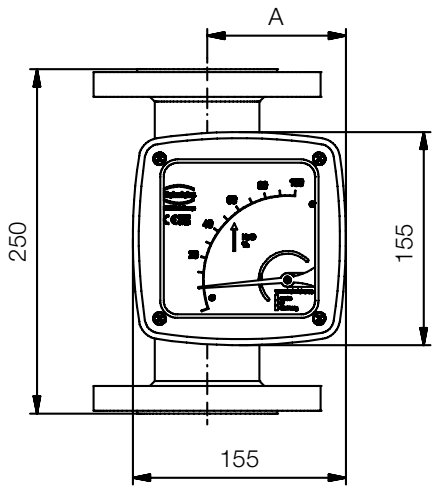
[1] Different measuring range for model BGN-P (PTFE-chasing)
[2] Other flange connections: Form N, D, JIS or Class 300 on request
[3] Only for models BGN-S/H
[4] Not for model BGN-H (Hastelloy®)
[5] Only for model BGN-S up to 40 l/h
[7] Damping not possible
[8] Not available with heating / cooling
[9] IEC 61508-2:2010 Conformity confirmed by EXIDA
[10] Option display only available in »V«, »H« and »W«
[11] For gas measurements a factor of 2-3 of the inlet pressure should be considered
[12] Only for BGN-S and BGN-H,only with reduced sealing face
[13] Only for models BGN-S/H from 5 l/h up to 80000 l/h
[14] Not for BGN-S10/-P10
[15] Stainless steel display housing is not compatible with counter module

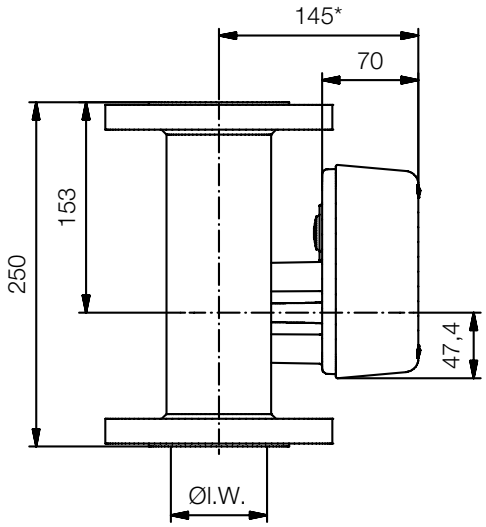
For the right design of the flowmeter we need the following data:

measuring range with unit, measured media, process temperature and pressure, viscosity, operating density (liquids), norm density (gases), mechanical connections

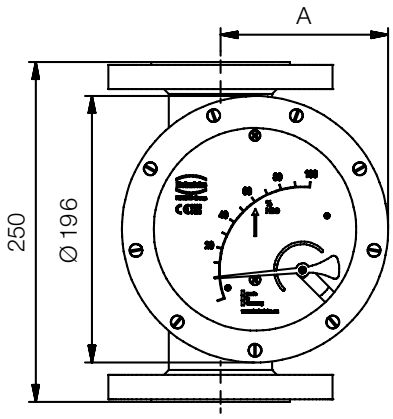
Dimensions [mm]

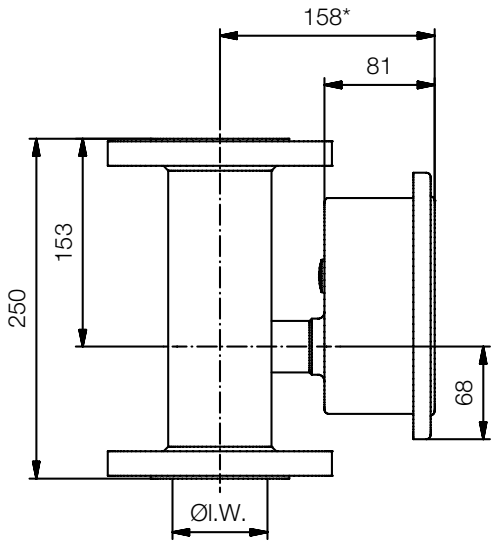
Display: aluminium





Display: stainless steel





DN	PN	I. W. (inner width)	A (aluminium)	A (st. steel)
15	40	26	74	100
25	40	32	77	103
40	40	46	85	110
50	40	70	98	123
80	40	102	14	140
100	16	125	127	153
125	16	150	142	166
150	16	159	148	171

Dimensional deviations:

* +100 mm with forward advanced display and generally at DN 125 and DN 150