



Full Metal Variable Area Flowmeter and Counter

for liquids and gases



measuring
•
monitoring
•
analysing

BGN



Special versions up to 600 bar

●
Nominal diameter up to DN150



- Measuring range:
0.5-5.0...13 000-130 000 L/h water
0.015-0.15...240-2400 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...DN 150
- Material: st. steel 1.4404/1.4571, Hastelloy C, PTFE
- Option:
contacts, analogue output with HART® or PROFIBUS-PA®, counter



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Description

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.

Application Areas

Flow measurement, dosing, 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

Sensor

Materials: 1.4404 (316 L) / 1.4571 (316 Ti), Hastelloy C-22, PTFE
other materials on request

Process connection: flanges acc. EN 1092, ASME B16.5, DIN 2512, JIS, NPT, screw pipe connection, special connections on request

Nominal pressure: PN 40, ASME C1150 / 300 (standard) (BGN-S/H)
PN 16, ASME C1150 (standard) (BGN-P)

higher pressure rates on request (max. 600 bar)

Process temperature: -40...+200°C (BGN-S/H without electr. output)

-40...+150°C (BGN-S/H with electr. output)

-40...+350°C (BGN-S/H with option V/H/W)

-40...+125°C (BGN-P)

Ambient temperature: -40...+80°C

Accuracy:

Liquid: ±1,6% of f.s. value (BGN-S/H)
±2,0% of f.s. value (BGN-P)

Gas: ±1,8% of f.s. value (BGN-S/H)
±2,2% of f.s. value (BGN-P)

Additional inaccuracy through transmitter (ES): ±0,2%

Repeatability: ±0,5% of f.s. value

Ingress protection: IP 65 (Aluminium housing)
IP 67 (Stainless steel housing)

Certification

Explosion protection: BVS 03 ATEX H/B 112

CE-Marking: Pressure Equipment Directive 97/23/EG

Display

Material: aluminium (stove-enameled)
stainless steel (as option)

Electr. outputs: inductive switch (standard)
inductive switch (safety design)
microswitch
others on request

Ambient temperature: -40...+80°C (without switch)


-40...+65°C (with switch)

**Technical Details** (continued)**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

| | |
|----------------------|--|
| Power supply: | 14-30 V _{DC} |
| Output: | passive, galvanically isolated |
| Currency: | 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 ... +70 °C |

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 |

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
- Backflow stop
- Flow controller
- Specialty low pressure loss



Full Metal Variable Area Flowmeter and Counter Model BGN

Order Details for Liquids (Example: BGN-S 105C A 0 000 S 1 0)

| Model | Measuring range water [L/h] | Measuring range air at 20°C, 1013 mbar [m³ _N /h] | Nominal diameter | Pressure stage (DIN flange) | Max. pressure loss [mbar] | Code ²⁾ flange DIN EN 1092-1 Form B1 | Code ²⁾ flange ASME Class 150 RF |
|---|-----------------------------------|---|------------------|-----------------------------|---------------------------|---|---|
| BGN-S = st.st. measuring tube | 0.5 - 5 (0.7 - 7) ¹⁾⁴⁾ | 0.015 - 0.15 | DN 15, (3/4") | PN 40 | 40 | 305B A | 202R A |
| | 1 - 10 (1.2 - 12) ¹⁾⁴⁾ | 0.03 - 0.3 | DN 15, (3/4") | PN 40 | 44 | 305B B | 202R B |
| | 1.6 - 16 (2 - 20) ¹⁾⁴⁾ | 0.145 - 0.48 | DN 15, (3/4") | PN 40 | 40 | 305B C | 202R C |
| | 2.5 - 25 ³⁾⁴⁾ | 0.075 - 0.75 | DN 15, (3/4") | PN 40 | 40 | 305B D | 202R D |
| | 4 - 40 ³⁾⁴⁾ | 0.13 - 1.3 | DN 15, (3/4") | PN 40 | 40 | 305B E | 202R E |
| | 5 - 50 | 0.15 - 1.5 | DN 15, (3/4") | PN 40 | 40 | 305B F | 202R F |
| | 7 - 70 | 0.2 - 2.1 | DN 15, (3/4") | PN 40 | 40 | 305B G | 202R G |
| | 10 - 100 | 0.3 - 3.0 | DN 15, (3/4") | PN 40 | 60 | 305B H | 202R H |
| | 16 - 160 | 0.5 - 4.6 | DN 15, (3/4") | PN 40 | 60 | 305B I | 202R I |
| | 25 - 250 | 0.7 - 7.0 | DN 15, (3/4") | PN 40 | 60 | 305B J | 202R J |
| | 40 - 400 | 1.0 - 11 | DN 15, (3/4") | PN 40 | 70 | 305B K | 202R K |
| | 60 - 600 | 1.7 - 17 | DN 15, (3/4") | PN 40 | 80 | 305B L | 202R L |
| | 0.5 - 5 (0.7 - 7) ¹⁾⁴⁾ | 0.015 - 0.15 ¹⁾⁴⁾ | DN 25, 1" | PN 40 | 40 | 309B A | 203R A |
| | 1 - 10 (1.2 - 12) ¹⁾⁴⁾ | 0.03 - 0.3 ¹⁾⁴⁾ | DN 25, 1" | PN 40 | 44 | 309B B | 203R B |
| | 1.6 - 16 (2 - 20) ¹⁾⁴⁾ | 0.145 - 0.48 ¹⁾⁴⁾ | DN 25, 1" | PN 40 | 40 | 309B C | 203R C |
| | 2.5 - 25 ³⁾⁴⁾ | 0.075 - 0.75 ³⁾⁴⁾ | DN 25, 1" | PN 40 | 40 | 309B D | 203R D |
| | 4 - 40 ³⁾⁴⁾ | 0.13 - 1.3 ³⁾⁴⁾ | DN 25, 1" | PN 40 | 40 | 309B E | 203R E |
| | 5 - 50 | 0.15 - 1.5 | DN 25, 1" | PN 40 | 40 | 309B F | 203R F |
| | 7 - 70 | 0.2 - 2.1 | DN 25, 1" | PN 40 | 40 | 309B G | 203R G |
| | 10 - 100 | 0.3 - 3.0 | DN 25, 1" | PN 40 | 60 | 309B H | 203R H |
| 16 - 160 | 0.5 - 4.6 | DN 25, 1" | PN 40 | 60 | 309B I | 203R I | |
| 25 - 250 | 0.7 - 7.0 | DN 25, 1" | PN 40 | 60 | 309B J | 203R J | |
| 40 - 400 | 1.0 - 11 | DN 25, 1" | PN 40 | 70 | 309B K | 203R K | |
| 60 - 600 | 1.7 - 17 | DN 25, 1" | PN 40 | 80 | 309B L | 203R L | |
| BGN-P = st.st. measuring tube, PTFE casing | 100 - 1000 | 3 - 30 | DN 25, 1" | PN 40 | 60 | 309B M | 203R M |
| | 160 - 1600 | 4 - 46 | DN 25, 1" | PN 40 | 70 | 309B N | 203R N |
| | 250 - 2500 | 7 - 70 | DN 25, 1" | PN 40 | 100 | 309B P | 203R P |
| | 400 - 4000 ³⁾⁹⁾ | 11 - 110 ³⁾⁹⁾ | DN 25, 1" | PN 40 | 240 | 309B Q | 203R Q |
| BGN-H = Hastelloy measuring tube | 250 - 2500 | 7 - 70 | DN 40, 1 1/2" | PN 40 | 50 | 317B P | 205R P |
| | 400 - 4000 | 11 - 110 | DN 40, 1 1/2" | PN 40 | 120 | 317B Q | 205R Q |
| | 600 - 6000 | 17 - 170 | DN 40, 1 1/2" | PN 40 | 180 | 317B R | 205R R |
| | 400 - 4000 | 11 - 110 | DN 50, 2" | PN 40 | 80 | 321B Q | 206R Q |
| | 600 - 6000 | 17 - 170 | DN 50, 2" | PN 40 | 90 | 321B R | 206R R |
| | 1000 - 10 000 | 29 - 290 | DN 50, 2" | PN 40 | 110 | 321B S | 206R S |
| | 1600 - 16 000 | 46 - 460 | DN 50, 2" | PN 40 | 230 | 321B T | 206R T |
| | 2500 - 25 000 ³⁾⁹⁾ | 70 - 700 ³⁾⁹⁾ | DN 50, 2" | PN 40 | 500 | 321B U | 206R U |
| | 1600 - 16 000 | 46 - 460 | DN 80, 3" | PN 40 | 70 | 331B T | 208R T |
| | 2500 - 25 000 | 70 - 700 | DN 80, 3" | PN 40 | 100 | 331B U | 208R U |
| | 4000 - 40 000 | 110 - 1100 | DN 80, 3" | PN 40 | 350 | 331B V | 208R V |
| | 4000 - 40 000 | 110 - 1100 | DN 100, 4" | PN 16 | 120 | 335B V | 210R V |
| 6000 - 60 000 (5500 - 55 000) ¹⁾ | 170 - 1700 | DN 100, 4" | PN 16 | 360 | 335B W | 210R W | |
| 8000 - 80 000 ³⁾ | 240 - 2400 ³⁾ | DN 100, 4" | PN 16 | 600 | 335B X | 210R X | |
| 10 000 - 100 000 ³⁾⁷⁾ | - | DN 100, 4" | PN 16 | on request | 335B 2 | 210R 2 | |
| 4000 - 40 000 ³⁾ | on request | DN 125, 5" | PN 16 | on request | 340B X | 211R X | |
| 80 000 - 80 000 ³⁾ | on request | DN 125, 5" | PN 16 | on request | 340B X | 211R 2 | |
| 10 000 - 100 000 ³⁾ | on request | DN 125, 5" | PN 16 | on request | 340B 2 | 211R 3 | |
| 10 000 - 100 000 ³⁾⁸⁾ | on request | DN 150, 6" | PN 16 | on request | 345B 2 | 212R 2 | |
| 13 000 - 130 000 ³⁾⁸⁾ | on request | DN 150, 6" | PN 16 | on request | 345B 4 | 212R 4 | |



Continuation Order Details for Liquids (Example: BGN-S 105C A 0 000 S 1 0)

| Heating ^{3)/} cooling | Dampin ^{3)/} spring stop | Draining body | Certificates | Display | Scale | Electrical output |
|---|---|---|---|---|--|---|
| <p>0 = without</p> <p>1 = with heating Ermeto 12 mm</p> <p>2 = with heating DIN flange DN 15/PN 40</p> <p>3 = with heating ANSI flange ½" Class 150</p> | <p>0 = without</p> <p>R = with flow restrictor for gas measuring⁵⁾</p> <p>F = with liquid damping</p> <p>G = with gas damping</p> <p>A = with spring stop</p> <p>S = with gas damping and spring stop⁶⁾</p> | <p>0 = without</p> <p>L = with self draining body</p> | <p>0 = without certificate</p> <p>1 = certificate of compliance with the order 2.1</p> <p>2 = certificate of compliance with the order 2.2</p> <p>B = inspection certificate with material certificate 3.1</p> <p>C = inspection certificate with material certificate 3.2</p> | <p>S = aluminium</p> <p>V = aluminium, assembled at distance up to 350 °C</p> <p>E = st. steel</p> <p>H = st. steel, assembled at distance up to 350 °C</p> <p>T = aluminium with pressure compensation</p> <p>W = aluminium with pressure compensation, assembled at distance up to 350 °C</p> | <p>Water</p> <p>1 = % scale</p> <p>2 = measuring range</p> <p>Media</p> <p>4 = % scale</p> <p>5 = measuring range</p> <p>Please specify mediadata in plain text (see below).</p> | <p>0 = without</p> <p>1 = 1 inductive switch</p> <p>2 = 2 inductive switches</p> <p>6 = transmitter ES with HART®, EEx ia, 4-20 mA</p> <p>7 = transmitter ES with HART®, EEx ia, 4-20 mA and 2 Namur switches</p> <p>8 = transmitter ES with HART®, EEx ia, 4-20 mA, 1 Namur switch and 1 pulse output</p> <p>9 = electrical transmitter with Profibus PA®, EEx ia</p> <p>I = 4-20 mA with HART® and counter module</p> |

Reference conditions: water at 20°C, 1 mPas

- 1) Different measuring range for model BGN-P (PTFE casing)
- 2) Other flange connections: Form B1, N, D, JIS or Class 300 on request
- 3) Not for model BGN-P (PTFE casing)
- 4) Not for model BGN-H (Hastelloy)
- 5) Only up to measuring range: 40 L/h
- 6) Only for nominal diameter DN 100
- 7) Damping spring stop not possible
- 8) Only available with forward advanced indicating housing
- 9) Not available with heating/cooling

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 connection

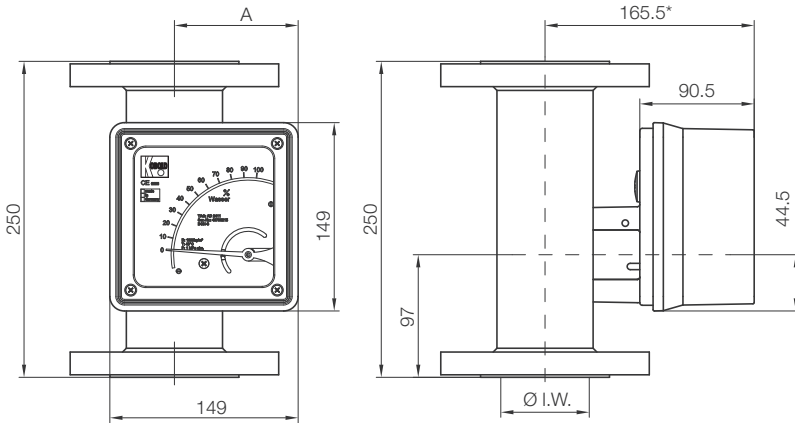
Food Connections

- Screwed pipe connection DIN 11851
- Tri-Clamp® DIN 32676
- VARIVENT®
- Others available on request

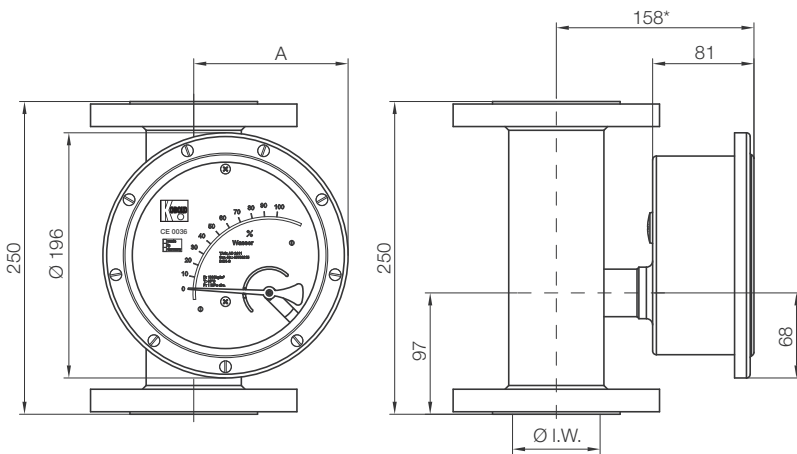


Dimensions

Display: aluminium



Display: stainless steel



| DN | PN | I. W. | 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 | 114 | 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