



## Full Metal Variable Area Flow Meter and Counter

for horizontal and vertical mounting



measuring  
•  
monitoring  
•  
analysing

BGF



Special versions up to 600 bar



- Measuring range:  
10 - 100 ... 4000 - 40 000 l/h water  
0.3 - 3.0 ... 110 - 1100 m<sup>3</sup>/h air  
(20 °C, 1.013 bar)
- Accuracy: ±2% of full scale
- p<sub>max</sub>: PN 40 (option: PN 400); t<sub>max</sub>: -40 ... +200 °C
- Connection: Flange DN 15 ... DN 80, ANSI ¾" ... 3"
- Material: stainless steel 1.4404/1.4571, PTFE
- Options:  
Contacts, analogue output with HART®,  
PROFIBUS®-PA, Foundation™ Fieldbus, counter



S2

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### Description

Inside the flow tube, there is a star guided float which works towards a spring. An annular gap is produced between the cone-shaped magnet system and the meter ring in case of flows other than zero. The position of the magnet system depends on the resulting force of all forces acting upon it. These forces comprise the flow force, a spring force acting opposite to the flow force, and the buoyancy and weight force significant for the measurements in case of vertical installation. Each position of the magnet holder corresponds to a flow value measured during calibration, which is transferred to a scale. The BGF flow meter consists of a meter tube with connections, a meter ring, and a conical magnet holder. By means of a magnet, the position of the magnet system 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 BGF meter is suitable for flow measurement of liquid or gaseous products in pipes. The special advantage is that it can be used for all directions of flow. It shows the current flow rate in volume or mass per unit in time.

### Areas of application

Flow measurement, dosing, monitoring, adjusting and control of liquid and gaseous products. The meter's design makes it ideal for processes under difficult and adverse 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
- Special design for high-pressure and high-temperature applications
- Excellent heat tracing technology (as option)
- Double eddy current damping (as option)

### Technical data

#### Sensor

|   |  |
|---|--|
| Materials:                                    | 1.4404 (316 L)/1.4571 (316 Ti),<br>Hastelloy C-22, PTFE<br>other materials on request  |
| Process connection:                           | Flanges acc. to EN 1092,<br>ASME B16.5, DIN 2512,<br>JIS, NPT, screw pipe,<br>connection, special connections<br>on request  |
| Nominal pressure:                             | PN 40, ASME CI150 / 300<br>(standard) (BGF-S)<br>PN 16, ASME CI150<br>(standard) (BGF-P)<br>higher pressure rates on request<br>(max. 400 bar)                                       |
| Process temperature:                          | -40°C...+150°C<br>(BGF-S with electrical output)<br>-40°C...+200°C<br>(BGF-S without electrical output)<br>-40°C...+200°C<br>(BGF-S with option V / H / W)<br>-40°C...+125°C (BGF-P) |
| Ambient temperature:                          | -40°C...+80°C  |
| <b>Accuracy</b>                               |  |
| Liquid/Gas:                                   | ± 2% of full scale   |
| Additional inaccuracy<br>by transmitter (ES): | ± 0.2%   |
| Repeatability:                                | ± 0.8% of full scale   |
| Schutzart:                                    | IP65 (Aluminium housing)<br>IP67 (Stainless steel housing)   |

#### Certificate and accreditation

Explosion protection: BVS 03 ATEX H/B 112

#### Advertisement

|                      |  |
|----------------------|--|
| Material:            | Aluminium (stove-enameled)<br>Stainless steel (optional)   |
| Electr. outputs:     | inductive switch<br>(standard)<br>inductive switch (safety design)<br>microswitch<br>others on request |
| Ambient temperature: | -40°C...+80°C<br>(without switch)<br>-40°C...+65°C<br>(with switch)                                    |



**Technical data** (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 <sub>DC</sub>  |
| Outputs:             | passive, galvanically isolated   |
| Currency:            | 4-20 mA  |
| Binary 1 and 2:      | U <sub>i</sub> = 30 V, I <sub>i</sub> = 20 mA, P <sub>i</sub> = 100 mW |
| Input Binary:        | Counter reset (only for ES with counter module)                        |
| Ambient temperature: | -40 °C ... +70 °C  |

**Certification and accreditation**

|                       |   |
|-----------------------|---|
| Explosion protection: | DMT 00 ATEX E 075   |
| Type of protection:   |  II 2G EEx ia IIC T6 |

**Additional options**

- Other materials
- Other flange versions and sizes
- Certifications and certificates
- Display with pressure compensations against condensate build up
- Microswitch
- Inductive switches with safety design



Full Metal Variable Area Flow Meter and Counter Model BGF

Order details (example: **BGF-S 15305B H K O 00 S 1 0**)

| Model                               | Measuring range water [l/h]                     | Measuring range air at 20 °C, 1013 mbar [Nm <sup>3</sup> /h] | Connection size | Pressure stage | Max. pressure loss [mbar] | Code <sup>2)</sup> flange DIN EN 1092-1 Form B1 | Code <sup>2)</sup> flange ASME Class 150 RF |
|-------------------------------------|---|--|-----------------|----------------|---------------------------|---|---|
| <b>BGF-S</b> = stainless steel tube | 10 - 100  | 0.3 - 3.0  | DN 15, (3/4")   | PN 40          | on request                | 15 305B H                                       | 15 202R H                                   |
|                                     | 16 - 160  | 0.5 - 4.6  | DN 15, (3/4")   | PN 40          | 110                       | 15 305B I                                       | 15 202R I                                   |
|                                     | 25 - 250  | 0.7 - 7.0  | DN 15, (3/4")   | PN 40          | 110                       | 15 305B J                                       | 15 202R J                                   |
|                                     | 40 - 400  | 1.0 - 11   | DN 15, (3/4")   | PN 40          | 110                       | 15 305B K                                       | 15 202R K                                   |
|                                     | 60 - 600  | 1.7 - 17   | DN 15, (3/4")   | PN 40          | 120                       | 15 305B L                                       | 15 202R L                                   |
|                                     | 100 - 1000                                      | 3.0 - 30   | DN 15, (3/4")   | PN 40          | 90                        | 15 305B M                                       | 15 202R M                                   |
|                                     | 160 - 1600                                      | 4.0 - 46   | DN 15, (3/4")   | PN 40          | 105                       | 15 305B N                                       | 15 202R N                                   |
|                                     | 250 - 2500                                      | 7.0 - 70   | DN 15, (3/4")   | PN 40          | 130                       | 15 305B P                                       | 15 202R P                                   |
|                                     | 400 - 4000 <sup>1)</sup>                        | 11 - 110 <sup>1)</sup>                                       | DN 15, (3/4")   | PN 40          | 240                       | 15 305B Q                                       | 15 202R Q                                   |
|                                     | 10 - 100  | 0.3 - 3.0  | DN 25, 1"       | PN 40          | on request                | 25 309B H                                       | 25 203R H                                   |
|                                     | 16 - 160  | 0.5 - 4.6  | DN 25, 1"       | PN 40          | 110                       | 25 309B I                                       | 25 203R I                                   |
|                                     | 25 - 250  | 0.7 - 7.0  | DN 25, 1"       | PN 40          | 110                       | 25 309B J                                       | 25 203R J                                   |
|                                     | 40 - 400  | 1.0 - 11   | DN 25, 1"       | PN 40          | 110                       | 25 309B K                                       | 25 203R K                                   |
|                                     | <b>BGF-P</b> = stainless steel tube, PTFE-liner | 60 - 600   | 1.7 - 17        | DN 25, 1"      | PN 40                     | 120   | 25 309B L                                   |
| 100 - 1000                          |   | 3.0 - 30   | DN 25, 1"       | PN 40          | 90                        | 25 309B M                                       | 25 203R M                                   |
| 160 - 1600                          |   | 4.0 - 46   | DN 25, 1"       | PN 40          | 105                       | 25 309B N                                       | 25 203R N                                   |
| 250 - 2500                          |   | 7.0 - 70   | DN 25, 1"       | PN 40          | 130                       | 25 309B P                                       | 25 203R P                                   |
| 400 - 4000 <sup>1)</sup>            |   | 11 - 110 <sup>1)</sup>                                       | DN 25, 1"       | PN 40          | 240                       | 25 309B Q                                       | 25 203R Q                                   |
| 250 - 2500                          |   | 7.0 - 70   | DN 40, 1 1/2"   | PN 40          | 75                        | 40 317B P                                       | 40 205R P                                   |
| 400 - 4000                          |   | 11 - 110   | DN 40, 1 1/2"   | PN 40          | 110                       | 40 317B Q                                       | 40 205R Q                                   |
| 600 - 6000                          |   | 17 - 170   | DN 40, 1 1/2"   | PN 40          | 130                       | 40 317B R                                       | 40 205R R                                   |
| 400 - 4000                          |   | 11 - 110   | DN 50, 2"       | PN 40          | 100                       | 50 321B Q                                       | 50 206R Q                                   |
| 600 - 6000                          |   | 17 - 170   | DN 50, 2"       | PN 40          | 110                       | 50 321B R                                       | 50 206R R                                   |
| 1000 - 10000                        |   | 29 - 290   | DN 50, 2"       | PN 40          | 120                       | 50 321B S                                       | 50 206R S                                   |
| 1600 - 16000                        |   | 46 - 460   | DN 50, 2"       | PN 40          | 130                       | 50 321B T                                       | 50 206R T                                   |
| 2500 - 25000                        |   | 70 - 700   | DN 50, 2"       | PN 40          | 200                       | 50 321B U                                       | 50 206R U                                   |
| 1600 - 16000                        |   | 46 - 460   | DN 80, 3"       | PN 40          | 110                       | 80 331B T                                       | 80 208R T                                   |
| 2500 - 25000                        | 70 - 700  | DN 80, 3"  | PN 40           | 130            | 80 331B U                 | 80 208R U                                       |   |
| 4000 - 40000                        | 110 - 1100                                      | DN 80, 3"  | PN 40           | 200            | 80 331B V                 | 80 208R V                                       |   |

Reference conditions: water at 20 °C, 1 mPas

<sup>1)</sup> Not for model BGF-P (PTFE-casing)

<sup>2)</sup> Other flange connections: Form C, N, D, JIS or Class 300 on request



Continuation order details for liquids (example: **BGF-S 15305B H K O 00 S 1 0**)

| Magnet bearer   | Flow direction   | Heating <sup>1)</sup> / Cooling  | Certificates   | Display   | Scale  | Electrical output   |
|---|--|--|--|---|--|---|
| <b>K</b> = PP <sup>1)</sup><br>(to 80 °C, from DN50)<br><br><b>P</b> = PTFE<br>(BGF-S to 150 °C)<br>(BGF-P to 125 °C)<br><br><b>S</b> = st. steel <sup>1)</sup> | <b>O</b> = top to bottom<br><br><b>L</b> = left to right<br><br><b>R</b> = right to left<br><br><b>U</b> = bottom to top | <b>0</b> = without<br><br><b>1</b> = with heating ermeto 12 mm<br><br><b>2</b> = with heating DIN-flange DN 15/ PN40<br><br><b>3</b> = with heating ANSI-flange ½" Class 150 | <b>0</b> = without certificate<br><br><b>1</b> = Certificate of compliance with the order 2.1<br><br><b>2</b> = Certificate of compliance with the order 2.2<br><br><b>B</b> = Inspection certificate with material certificate 3.1<br><br><b>C</b> = Inspection certificate with material certificate 3.2 | <b>S</b> = aluminium<br><br><b>V</b> = aluminium, assembled at 200 °C<br><br><b>E</b> = st. steel<br><br><b>H</b> = st. steel, assembled at distance up to 200 °C<br><br><b>T</b> = aluminium with pressure compensation<br><br><b>W</b> = aluminium with pressure compensation, assembled at distance up to 200 °C | <b>Water</b><br><b>1</b> = %-scale<br><b>2</b> = measuring range<br><br><b>Media</b><br><b>4</b> = %-scale<br><b>5</b> = measuring range<br><br>Please specify mediadata in plain text (see below) | <b>0</b> = without<br><b>1</b> = 1 inductive switch<br><b>2</b> = 2 inductive switches<br><b>C</b> = 1 × microswitch<br><b>D</b> = 2 × microswitches<br><br><b>6</b> = transmitter ES with HART®, EExia, 4-20 mA, SIL<br><b>7</b> = transmitter ES with HART®, EExia, 4-20 mA and 2 Namur-switches, SIL<br><b>8</b> = transmitter ES with HART®, EEx ia, 4-20 mA, 1 Namur switch and 1 pulse output<br><b>9</b> = electrical transmitter ES with Profibus®-PA, EExia<br><b>I</b> = 4-20 mA with HART® counter module<br><b>K</b> = electrical transmitters ES with Foundation™ Fieldbus |

<sup>1)</sup> Not for model BGF-P (PTFE-coating)

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.

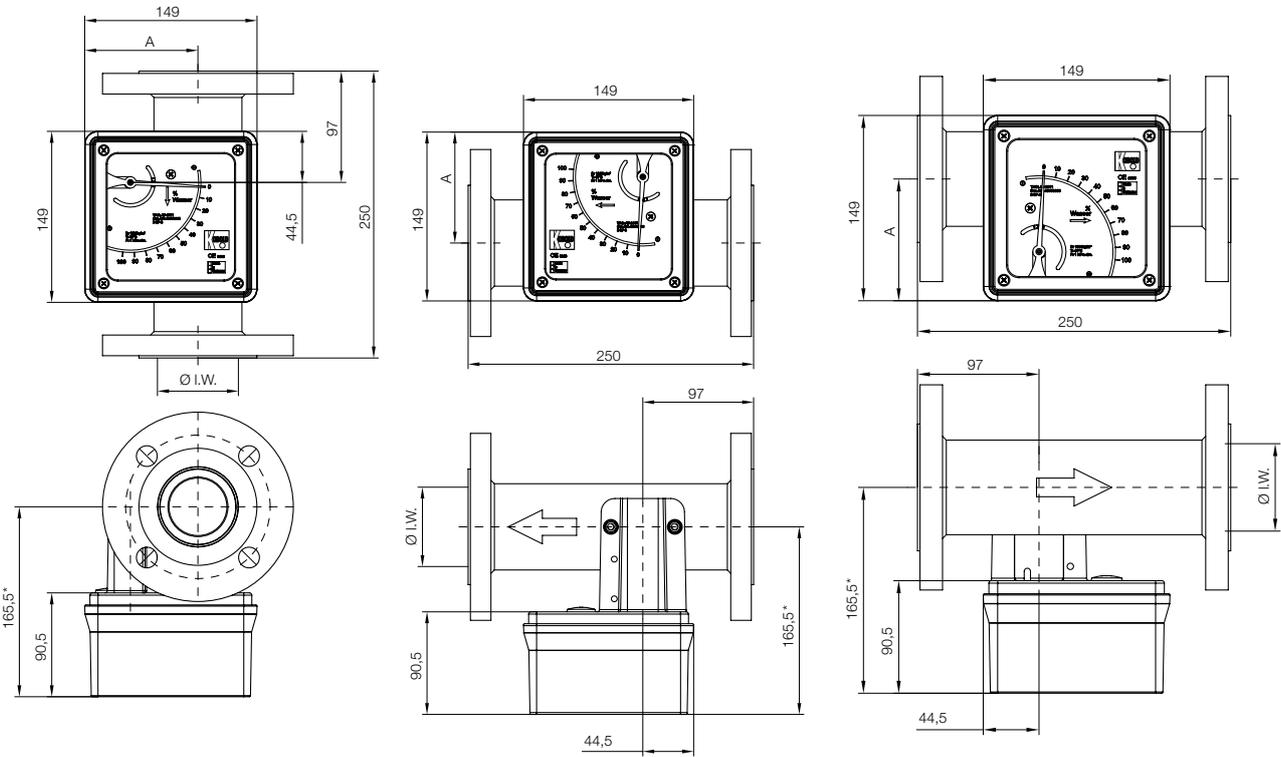
**Dimensions [mm]**

| DN | PN | I. W. | A (aluminium) | A (stainless 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                 |

Dimensional deviations:  
 +100 mm with forward advanced display

**Dimensions [mm]**

Display: aluminium



Display: stainless steel

