Diaphragm pressure gauge, flush
For sanitary applications
Model PG43SA-S, NS 100

Applications

- Hygienic pressure measurement in sanitary applications for the pharmaceutical, biotechnology, food and beverage industries
- Mechanical pressure display on pipelines, fermenters, bioreactors and vessels
- Pressure/vacuum monitoring during cleaning, sterilisation, pressure testing
- For gases, compressed air, vapour; liquid, pasty, powdery and crystallising media

Special features

- Safety via mechanical pressure transmission
- Case and wetted parts in hygienic design
- Suitable for SIP and CIP, optionally completely autoclavable
- Simple zero point setting
- High overpressure safety

Description

The model PG43SA diaphragm pressure gauge has been specifically designed for the requirements of sanitary applications.

The purely mechanical pressure transmission, using the diaphragm-element measuring principle, and the high overpressure safety ensure a safe pressure measurement. As a result of the dry measuring cell, the risk of contamination of the product by transmission fluid is eliminated. The flush welded diaphragm element in conjunction with the aseptic process connections (e.g. clamp, threaded, VARIVENT®, BioControl®) enables a dead-space free connection to the process.

The instrument finds applications, for example, in systems for ultrapure steam generation or as an independent pressure display, without the need for an external power supply, on portable tanks.

The PG43SA-S in hygienic design can be used for CIP (cleaning in place) and SIP (sterilisation in place) and in wash-down areas, and optionally it can be completely sterilised in an autoclave. The measuring instrument can thus be cleaned reliably and time-efficiently. At an easily accessible point on the top of the case, the zero point can be easily corrected.

Based on a third party verification, the model PG43SA-S corresponds to the 3-A Sanitary Standard.

A variety of 3.1 and 2.2 certificates are available for GMP-compliant documentation, such as a material certificate or the list of single measured values.
Specifications

Version
EN 837-3

Nominal size in mm
100

Accuracy class
1.6

<table>
<thead>
<tr>
<th>Scale ranges</th>
<th>bar</th>
<th>psi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 ... 1.6</td>
<td>0 ... 30</td>
</tr>
<tr>
<td></td>
<td>0 ... 6</td>
<td>0 ... 100</td>
</tr>
<tr>
<td></td>
<td>-1 ... +0.6</td>
<td>-30 inHg ... +30</td>
</tr>
<tr>
<td></td>
<td>-1 ... +1.5</td>
<td>-30 inHg ... +60</td>
</tr>
<tr>
<td></td>
<td>-1 ... +3</td>
<td>-30 inHg ... +150</td>
</tr>
<tr>
<td></td>
<td>0 ... 4</td>
<td>0 ... 4</td>
</tr>
<tr>
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<td>0 ... 16</td>
<td>0 ... 60</td>
</tr>
<tr>
<td></td>
<td>-1 ... 9</td>
<td>-1 ... 160</td>
</tr>
<tr>
<td></td>
<td>-1 ... 15</td>
<td>-30 inHg ... +150</td>
</tr>
</tbody>
</table>

Option: Dual scale
The given scale ranges are also available in kPa and MPa.

Pressure limitation
Steady: Full scale value
Fluctuating:
Scale range <4 bar: Full scale value
Scale range ≥4 bar: 2/3 x full scale value
Option: Vacuum safety

Overpressure safety
2x full scale value, max. 40 bar or max. pressure rating (PN) of the process connection
Option: 5x full scale value, max. 40 bar or max. pressure rating (PN) of the process connection

Permissible temperature
Ambient: -20 ... +60 °C
Medium: -20 ... +150 °C
CIP and SIP: 150 °C continuously for wetted parts
Option: Autoclavable, max. 134 °C, ≤ 20 minutes

Temperature effect
When the temperature of the measuring system deviates from the reference temperature (+20 °C): max. ±0.5 % / 10 K of full scale value

Ingress protection per EN/IEC 60529
IP54

Process connection
Stainless steel 1.4435 (316L), UNS S31603, lower mount
- Clamp connection per DIN 32676 / ISO 2852
- Aseptic connection per DIN 11864-1 /-2 /-3
- Milk thread fitting per DIN 11851
- VARIVENT®
- NEUMO BioControl®
- SMS threaded connection
- others on request

For exact designs and nominal widths see tables from page 4

Pressure element
Diaphragm element, welded to the process connection,
NiCr alloy 2.4668 (Inconel® 718), UNS N07718

Surface roughness of wetted parts
- Ra ≤ 0.76 μm (30 μin) per ASME BPE SF3
- Option: Ra ≤ 0.38 μm (15 μin),
  weld seam: Ra ≤ 0.76 μm (30 μin)
- Option: Electropolished, Ra ≤ 0.38 μm (15 μin) per
  ASME BPE SF4, weld seam: Ra ≤ 0.76 μm (30 μin)

Level of cleanliness of wetted parts
ASTM G93 level C / ISO 15001 (residual content of non-volatile hydrocarbons ≤ 66 mg/m²)

Movement
Stainless steel

Dial
Aluminium, white, black lettering

Pointer
Aluminium, black

Case
Stainless steel 1.4301 (304), electropolished
Surface roughness: Ra ≤ 0.76 μm (30 μin), (except for weld seam)

Window
Polycarbonate (polysulfone for autoclavable versions)

Ring
Crimp ring, stainless steel 1.4301 (304)

VARIVENT® is a registered trademark of the company GEA Tuchenhagen.
BioControl® is a registered trademark of the company NEUMO.
External zero point setting
Setting range $\pm 15^\circ = \pm 5.5\%$ of the span

The zero point setting can be made with a slotted screwdriver after the removal of the sealing plug on the top of the case.

Measuring principle

The diaphragm element is welded flush to the aseptic process connection. On pressurisation, the deflection of the pressure element, proportional to the incident pressure, is transferred mechanically to a movement via a link. The risk of contamination by transmission fluid is therefore eliminated.
### Dimensions in mm

#### Type of process connection: Clamp connection per DIN 32676
Pipe standard: Pipes per DIN 11866 row C or ASME BPE

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
<th>NS</th>
<th>h</th>
<th>Ø Pf</th>
<th>d</th>
<th>k</th>
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<tr>
<td>1½&quot;</td>
<td>38.1 x 1.65</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>50.5</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>2&quot;</td>
<td>50.8 x 1.65</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

#### Type of process connection: Clamp connection per DIN 32676
Pipe standard: Pipes per DIN 11866 row B or ISO 1127 row 1

<table>
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<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
<th>NS</th>
<th>h</th>
<th>Ø Pf</th>
<th>d</th>
<th>k</th>
</tr>
</thead>
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<td>42.4</td>
<td>42.4 x 2</td>
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<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>48.3</td>
<td>48.3 x 2</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

#### Type of process connection: Clamp connection per BS4825 Part 3
Pipe standard: Pipes per BS4825 part 1 and O.D. tube

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
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<th>h</th>
<th>Ø Pf</th>
<th>d</th>
<th>k</th>
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<tr>
<td>1½&quot;</td>
<td>38.1 x 1.6</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>50.5</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>2&quot;</td>
<td>50.8 x 1.6</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

#### Type of process connection: Clamp connection per DIN 32676
Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
<th>NS</th>
<th>h</th>
<th>Ø Pf</th>
<th>d</th>
<th>k</th>
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</thead>
<tbody>
<tr>
<td>40</td>
<td>41 x 1.5</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>50.5</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>53 x 1.5</td>
<td>40</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

#### Type of process connection: Clamp connection per ISO 2852
Pipe standard: Pipes per ISO 2037 and BS 4825 part 1

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
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<td>50.5</td>
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<td></td>
</tr>
<tr>
<td>40</td>
<td>40 x 1.2</td>
<td>25</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
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<tr>
<td>51</td>
<td>51 x 1.2</td>
<td>25</td>
<td>100</td>
<td>91</td>
<td>35</td>
<td>64</td>
<td>15</td>
<td></td>
</tr>
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</table>

1) For maximum pressure range consider pressure rating of clamp.

EHEDG conformity only in combination with Tri-Clamp seals from Combifit International B.V.
Type of process connection: Threaded connection per DIN 11851
Pipe standard: Pipes per DIN 11850 row 2

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>41 x 1.5</td>
<td>40</td>
<td>100 91 100 35 Rd 65 x 1/6 78 22 23 14 27</td>
</tr>
<tr>
<td>50</td>
<td>53 x 1.5</td>
<td>25</td>
<td>100 91 100 35 Rd 78 x 1/6 92 22 23 14 27</td>
</tr>
</tbody>
</table>

For a 3-A conform connection of process connections with milk thread fittings per DIN 11851, profile sealings from SKS Komponenten BV or Kieselmann GmbH have to be used.

EHEDG conformity only in combination with ASEPTO-STAR k-flex upgrade, sealing from Kieselmann GmbH.
Aseptic threaded pipe connection per DIN 11864-1 form A

with liner and grooved union nut

Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A
Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS h1 h2 Ø Plf G d1 d2 D k1 k2 a SW</td>
</tr>
<tr>
<td>40</td>
<td>41 x 1.5</td>
<td>40</td>
<td>100 95 98 35 Rd 65 x 1/6 54.9 55 78 22 23 14 27</td>
</tr>
<tr>
<td>50</td>
<td>53 x 1.5</td>
<td>25</td>
<td>100 95 96 35 Rd 78 x 1/6 66.9 67 92 22 23 14 27</td>
</tr>
</tbody>
</table>

Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A
Pipe standard: Pipes per DIN 11866 row B or DIN ISO 1127 row 1

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS h1 h2 Ø Plf G d1 d2 D k1 k2 a SW</td>
</tr>
<tr>
<td>42.4</td>
<td>42.4 x 2.0</td>
<td>25</td>
<td>100 95 98 35 Rd 65 x 1/6 54.9 55 78 22 23 14 27</td>
</tr>
<tr>
<td>48.3</td>
<td>48.3 x 2.0</td>
<td>25</td>
<td>100 95 96 35 Rd 78 x 1/6 66.9 67 92 22 23 14 27</td>
</tr>
</tbody>
</table>

Type of process connection: Aseptic threaded pipe connection per DIN 11864-1 form A
Pipe standard: Pipes per DIN 11866 row C or ASME BPE

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS h1 h2 Ø Plf G d1 d2 D k1 k2 a SW</td>
</tr>
<tr>
<td>1 ½”</td>
<td>38.1 x 1.65</td>
<td>40</td>
<td>100 95 98 35 Rd 58 x 1/6 54.9 55 78 22 23 14 27</td>
</tr>
<tr>
<td>2”</td>
<td>50.8 x 1.65</td>
<td>25</td>
<td>100 95 96 35 Rd 65 x 1/6 66.9 67 92 22 23 14 27</td>
</tr>
</tbody>
</table>

1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature from -10 ... +140 °C.
Aseptic flange connection per DIN 11864-2 form A

Type of process connection: Aseptic flange connection per DIN 11864-2 form A
Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN 1)</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>NS  h1 h2 Ø Plf d1 d2 d3 d4 D k1 k2 a1 a2</td>
</tr>
<tr>
<td>40</td>
<td>41 x 1.5</td>
<td>25</td>
<td>100 94 92 35 65 4 x Ø 9 53.6 53.7 82 17.5 15 11.5 10</td>
</tr>
<tr>
<td>50</td>
<td>53 x 1.5</td>
<td>16</td>
<td>100 94 92 35 77 4 x Ø 9 65.6 65.7 94 17.5 15 11.5 10</td>
</tr>
</tbody>
</table>

Type of process connection: Aseptic flange connection per DIN 11864-2 form A
Pipe standard: Pipes per DIN 11866 row B or DIN ISO 1127 row 1

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN 1)</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td>NS  h1 h2 Ø Plf d1 d2 d3 d4 D k1 k2 a1 a2</td>
</tr>
<tr>
<td>42.4</td>
<td>42.4 x 2.0</td>
<td>16</td>
<td>100 94 92 35 65 4 x Ø 9 54 54.1 82 17.5 15 11.5 10</td>
</tr>
<tr>
<td>48.3</td>
<td>48.3 x 2.0</td>
<td>16</td>
<td>100 94 92 35 71 4 x Ø 9 59.9 60 88 17.5 15 11.5 10</td>
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</tbody>
</table>

Type of process connection: flange connection per DIN 11864-2 form A
Pipe standard: Pipes per DIN 11866 row C or ASME BPE

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN 1)</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS  h1 h2 Ø Plf d1 d2 d3 d4 D k1 k2 a1 a2</td>
</tr>
<tr>
<td>1 ½&quot;</td>
<td>38.1 x 1.65</td>
<td>25</td>
<td>100 94 92 35 65 4 x Ø 9 50.4 50.4 79 17.5 15 11.5 10</td>
</tr>
<tr>
<td>2&quot;</td>
<td>50.8 x 1.65</td>
<td>16</td>
<td>100 94 92 35 75 4 x Ø 9 63.4 63.5 92 17.5 15 11.5 10</td>
</tr>
</tbody>
</table>

1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature from -10 ... +140 °C.
### Aseptic clamp connection per DIN 11864-3 form A

#### with clamp with groove

![Diagram of clamp with groove](image1.png)

#### with clamp with notch

![Diagram of clamp with notch](image2.png)

**Type of process connection: Aseptic clamp connection per DIN 11864-3 form A**

Pipe standard: Pipes per DIN 11866 row A or DIN 11850 row 2

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN 1)</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS  h  Ø Plf d1  d2  D  k1  k2</td>
</tr>
<tr>
<td>40</td>
<td>41 x 1.5</td>
<td>40</td>
<td>100  92  35</td>
</tr>
<tr>
<td>50</td>
<td>53 x 1.5</td>
<td>25</td>
<td>100  92  35</td>
</tr>
</tbody>
</table>

**Type of process connection: Aseptic clamp connection per DIN 11864-3 form A**

Pipe standard: Pipes per DIN 11866 row B or DIN ISO 1127 row 1

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN 1)</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>NS  h  Ø Plf d1  d2  D  k1  k2</td>
</tr>
<tr>
<td>42.4</td>
<td>42.4 x 2.0</td>
<td>25</td>
<td>100  92  35</td>
</tr>
<tr>
<td>48.3</td>
<td>48.3 x 2.0</td>
<td>25</td>
<td>100  92  35</td>
</tr>
</tbody>
</table>

**Type of process connection: Aseptic clamp connection per DIN 11864-3 form A**

Pipe standard: Pipes per DIN 11866 row C or ASME BPE

<table>
<thead>
<tr>
<th>DN</th>
<th>For pipe Outer Ø x wall thickness</th>
<th>PN 1)</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ½&quot;</td>
<td>38.1 x 1.65</td>
<td>40</td>
<td>100  92  35</td>
</tr>
<tr>
<td>2&quot;</td>
<td>50.8 x 1.65</td>
<td>25</td>
<td>100  92  35</td>
</tr>
</tbody>
</table>

1) Permissible pressure in bar; these pressures may only be applied when using suitable sealing materials up to a temperature from -10 ... +140 °C.
**Type of process connection: VARIVENT®**

![VARIVENT® Connection Diagram](image)

<table>
<thead>
<tr>
<th>Access unit connection</th>
<th>PN</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>NS h Ø Plf d D k a</td>
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<tr>
<td>Form F</td>
<td>25</td>
<td>100 93 35 49.95 66 17 12.3</td>
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<tr>
<td>Form N</td>
<td>25</td>
<td>100 93 35 68 84 17 12.3</td>
</tr>
</tbody>
</table>

1) Consider pressure rating of VARINLINE® access unit

**Note:**

Suitable for installation into the VARINLINE® access unit from GEA Tuchenhagen.

VARIVENT® and VARINLINE® are registered trademarks of the company GEA Tuchenhagen GmbH.

**Type of process connection: NEUMO BioControl®**

![NEUMO BioControl® Connection Diagram](image)

<table>
<thead>
<tr>
<th>BioControl® connection</th>
<th>PN</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>NS h Ø Plf d d1 d2 D k a</td>
</tr>
<tr>
<td>Size 50</td>
<td>16</td>
<td>100 103 35 49.9 70 4 x Ø 9 90 26 17</td>
</tr>
<tr>
<td>Size 65</td>
<td>16</td>
<td>100 103 35 67.9 95 4 x Ø 9 120 26 17</td>
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</table>

2) Consider pressure rating of NEUMO BioControl® connection

Note:

EHEDG conformity only in combination with EPDM O-ring from GEA Tuchenhagen GmbH.
Approvals

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
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<tbody>
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<td>European Union</td>
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<td>ATEX directive (option)</td>
<td></td>
</tr>
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<tr>
<td>- Ex h</td>
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<td></td>
</tr>
<tr>
<td>Zone 21 dust</td>
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<tr>
<td>[II 2D Ex h IIIC T85 °C ... T450 °C Db X]</td>
<td></td>
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<tr>
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<td>GOST (option)</td>
<td>Russia</td>
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<tr>
<td>![KazInMetr]</td>
<td>KazInMetr (option)</td>
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<tr>
<td>![Uzstandard]</td>
<td>Uzstandard (option)</td>
<td>Usbekistan</td>
</tr>
<tr>
<td>![3-A]</td>
<td>3-A Sanitary Standard</td>
<td>USA</td>
</tr>
<tr>
<td>![EHEDG]</td>
<td>EHEDG Hygienic Equipment Design</td>
<td>European Community</td>
</tr>
<tr>
<td>![CRN]</td>
<td>CRN Safety (e.g. electr. safety, overpressure, ...)</td>
<td>Canada</td>
</tr>
</tbody>
</table>

Manufacturer's information and certifications

Manufacturer's declaration regarding regulation (EC) no. 1935/2004

Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy, free from substances of animal origin)
- 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metallic parts, indication accuracy)
- Others on request

Approvals and certificates, see website

Ordering information

Scale range / Type of process connection, pipe standard, dimension / Autoclavable version / Overpressure limit / Certificates / Approvals / Options