Richter Sampling Valves

- Body ductile iron with PFA lining or investment cast stainless steel
- Bellows-sealed
- Safety packing gland
- Representative sampling

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Richter sampling valves

Fields of application
Representative and safe sampling of pure and slightly solids-laden media in the chemical, pharmaceutical and other industries.

The Richter series PA/F (fluoroplastic lining PFA) and PA/S (stainless steel version) are specially suitable for taking samples
• of corrosive and pure media, also slightly solids-laden media
• during the actual process
• prior to filling into other containers/further transport
• prior to feeding into the process
• for the regular monitoring of stocks
• in the piping and from containers

Operating ranges
• from -60 to 200 °C (-75 to 400 °F)
• from vacuum to max. 16 bar (235 psi)

Product features
• Top-entry design for very easy maintenance, the valve body can remain installed in the system
• Valve actuation: safety hand lever, removable. Pneumatic or electric actuator on request.
• Long plug tip: Counteracts clogging, e.g. caking media.
• Anti-adhesive, wetted surfaces thanks to PFA/PTFE (PA/F), can be steam-sterilised (must be checked on a case-to-case basis)
• External corrosion protection: Epoxy coating (PA/F), stainless steel valve bonnet and screws
• Marking: to DIN EN 19
• On request with stainless steel protective cabinet (see page 5)

Type codes, materials
Sampling valve
• manual actuation PA/...
• remote actuation PAP/...
• perfluoroalkoxy (PFA) lined .../F
• stainless steel version .../S

DIFFERENTIATION TO SAMPLING BALL VALVES

Conventional sampling ball valves
• are not cavity-free: Residues remain in the area between the ball and the body lining and therefore, before a representative sample can be taken, rinsing must be performed several times and troublesome disposal of the initial samples is necessary
• promote an undesirable increase in the sedimentation of solids in the dead leg above the ball
• are usually not self-closing, no “dead man’s handle”
• have a normal packing gland seal, are not self-adjusting, have no bellows sealing

• Travel stop, adjustable from outside
  • finely metered sampling
  • closing force can be increased at any time if the sealing action in the seat/plug area is insufficient (e.g. if sealing surfaces damaged)
• Safety spring return
  by means of a central spring suitable for all pressure ranges (“dead man’s handle”)
• Safety packing gland
  • acts independently
  • re-adjustable from outside
• a: Lining virgin PFA
  • wall thickness 3 - 3.5 mm
  • high permeation resistance
  • vacuum-proof anchored
• b: Alternatively stainless steel 1.4435 (316 L) investment cast body without lining
• Glandless due to heavy-duty PTFE bellows
  • hermetic sealing of the product chamber
  • bellows wall 2.5 mm thick, can also be used for highly permeating media
• Cavity-free
  • tapered valve bottom
  • representative sampling: only fresh medium is taken
  • no prior rinsing necessary
  • no formation of residue in the entire valve
• Standard bottle connection with thread GL to DIN 168
  • modified pure PTFE
  • secured against turning
  • possibility of side connection for venting or overflow
  • for PA/F: integrated FKM O-ring (Viton® or equivalent) is not wetted
  • further connection possibilities (page 6)
• Removable safety hand lever
  • disengages after actuation
  • on request firmly installed with split pin in central bore
  • lockable with lock or split pin
  • alternative position: lever upwards
• Highly viscous media or applications with low operating pressure:
Special plug and seat option (see page 6).
• For solids-laden media:
Inclined or vertical position of the valve and, as a result, possibly special bottle connection are recommended (see page 6).
Sampling valve PA/F
with thick-walled PFA lining

Sampling valve PA/S
of stainless steel design (without lining)
Richter sampling valves

Components and materials

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Body</td>
<td>PA/F: ductile cast iron EN-JS 1049/ASTM A395 with PFA lining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PA/S: investm. cast stainl. steel 1.4435 (316 L)</td>
</tr>
<tr>
<td>104</td>
<td>Transition flange</td>
<td>stainless steel (only DN 40+80, not shown)</td>
</tr>
<tr>
<td>106</td>
<td>Cover</td>
<td>stainless steel</td>
</tr>
<tr>
<td>203</td>
<td>Lever</td>
<td>stainless steel</td>
</tr>
<tr>
<td>205</td>
<td>Seat</td>
<td>PA/F: ductile cast iron EN-JS 1049/ASTM A395 with PFA lining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DN 40+80: stainless steel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PA/S: investm. cast stainl. steel 1.4435 (316 L)</td>
</tr>
<tr>
<td>206</td>
<td>Bellows w. plug</td>
<td>modified pure PTFE</td>
</tr>
<tr>
<td>226</td>
<td>Bottle connection</td>
<td>modified pure PTFE</td>
</tr>
<tr>
<td>302/1</td>
<td>Guide ring</td>
<td>PTFE carbon</td>
</tr>
<tr>
<td>400/1</td>
<td>O-ring, not wetted</td>
<td>FKM (Viton® or equivalent)</td>
</tr>
<tr>
<td>402/1</td>
<td>Packing ring</td>
<td>PTFE</td>
</tr>
<tr>
<td>405/1</td>
<td>Thrust ring</td>
<td>stainless steel</td>
</tr>
<tr>
<td>503</td>
<td>Packing gland follower</td>
<td>stainless steel</td>
</tr>
<tr>
<td>509/1</td>
<td>Groove nut</td>
<td>stainless steel</td>
</tr>
<tr>
<td>513</td>
<td>Spring bonnet</td>
<td>stainless steel</td>
</tr>
<tr>
<td>514</td>
<td>Spring bush</td>
<td>stainless steel</td>
</tr>
<tr>
<td>515</td>
<td>Actuation</td>
<td>stainless steel</td>
</tr>
<tr>
<td>550/1</td>
<td>Disc</td>
<td>stainless steel</td>
</tr>
<tr>
<td>561/1</td>
<td>Grooved pin</td>
<td>stainless steel</td>
</tr>
<tr>
<td>855</td>
<td>Stem</td>
<td>stainless steel</td>
</tr>
<tr>
<td>902/1</td>
<td>Stud screw</td>
<td>stainless steel</td>
</tr>
<tr>
<td>904/1</td>
<td>Setscrew</td>
<td>stainless steel</td>
</tr>
<tr>
<td>920/3</td>
<td>Hex. check nut</td>
<td>stainless steel</td>
</tr>
<tr>
<td>952</td>
<td>Pressure spring</td>
<td>stainless steel</td>
</tr>
<tr>
<td>963</td>
<td>Star knob</td>
<td>plastic/stainless steel</td>
</tr>
<tr>
<td>964</td>
<td>Ball head</td>
<td>plastic</td>
</tr>
</tbody>
</table>

Temperature/pressure ranges

<table>
<thead>
<tr>
<th>Temperature °C (°F)</th>
<th>20 (70)</th>
<th>150 (300)</th>
<th>200 (400)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure bar (psi)</td>
<td>16 (235)</td>
<td>15 (220)</td>
<td>14 (205)</td>
</tr>
</tbody>
</table>

**k**<sub>100</sub> values (m<sup>3</sup>/h), Cv values (US gpm)

<table>
<thead>
<tr>
<th>DN</th>
<th>inch</th>
<th>k&lt;sub&gt;100&lt;/sub&gt; (Cv)</th>
<th>Valve flow rate</th>
<th>k&lt;sub&gt;500&lt;/sub&gt; (Cv)</th>
<th>Sampling flow rate at max. stroke</th>
<th>Tapered plug</th>
<th>Flat plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>1&quot;</td>
<td>15 (17.5)</td>
<td>0.385 (0.448)</td>
<td>2.56 (2.98)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>1 1/2&quot;</td>
<td>47 (54.6)</td>
<td>65 (75.7)</td>
<td>200 (233)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>2&quot;</td>
<td>85 (96.3)</td>
<td>310 (360)</td>
<td>97 (110)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>3&quot;</td>
<td>165 (185.3)</td>
<td>310 (360)</td>
<td>97 (110)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other valve sizes on request

Installation and connecting dimensions (mm) and weights

- **Face-to-face PA/F and PA/S**
  - ISO 5752 series 1 (DIN EN 558-1 series 1, formerly DIN 3202/F1)
- **Flanges PA/F and PA/S**
  - ISO 7005-1 PN 16 (DIN EN 1092-2, formerly DIN 2532/33), on request drilled to ASME/ANSI Cl. 150, BS, JIS

<table>
<thead>
<tr>
<th>DN</th>
<th>mm</th>
<th>D</th>
<th>k</th>
<th>mnds</th>
<th>H</th>
<th>PA/F</th>
<th>E</th>
<th>L</th>
<th>F</th>
<th>approx. weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>1&quot;</td>
<td>115</td>
<td>85</td>
<td>4 x 14</td>
<td>190</td>
<td>123</td>
<td>200</td>
<td>160</td>
<td>ca. 235</td>
<td>10</td>
</tr>
<tr>
<td>40</td>
<td>1 1/2&quot;</td>
<td>150</td>
<td>110</td>
<td>4 x 19</td>
<td>250</td>
<td>127</td>
<td>–</td>
<td>200</td>
<td>160</td>
<td>ca. 175</td>
</tr>
<tr>
<td>50</td>
<td>2&quot;</td>
<td>165</td>
<td>125</td>
<td>4 x 19</td>
<td>195</td>
<td>131</td>
<td>200</td>
<td>230</td>
<td>ca. 230</td>
<td>18</td>
</tr>
<tr>
<td>80</td>
<td>3&quot;</td>
<td>200</td>
<td>160</td>
<td>8 x 19</td>
<td>310</td>
<td>173</td>
<td>–</td>
<td>211</td>
<td>310</td>
<td>97</td>
</tr>
</tbody>
</table>

* manually actuated

Other valve sizes on request
Options

**Sampling valves with stainless steel protective cabinet**

The protective cabinets are produced in standard sizes and with various accessories, also custom-made. Fig.: Option with spring-loaded bottle holder.

**Sampling valves with actuator**

Pneumatic and electric actuators. Makes as per customer’s choice.

**Septum bottle adapter for high-purity media**

For design details, see page 6

**NEW:** Needle and adapter made of stainless steel

With this new option sampling in a septum bottle is even possible with the stainless steel series PA/S.

**Body heating**

e.g. for crystallising media, heating jacket made of stainless steel, mounted (PA/F) or welded on (PA/S)

**Handwheel instead of lever actuation**

Permits particularly finely metered sampling over the entire flow range of the valve. No automatic spring return.

**Flat plug for slightly solids-laden media**

The integrated FFKM O-ring still seals if small solid particles are jammed in the sealing surface area.

Viton® = Trademark of DuPont
Richter = Trademark of Richter Chemie-Technik GmbH
Plug and adapter versions

Special design for highly viscous media or applications with low operating pressure

The standard version of the PA valve with a tapered plug has a travel of 3 mm, producing an angular gap of 0.5 mm over a length of 20 mm. However, taking samples of:
- higher viscous media and
- media with a low operating pressure
requires an enlarged passage cross section.

With a travel of 3 mm the special flat plug produces a full cross section of the outlet opening of 10 mm. The suitable valve plug is selected according to the viscosity/operating pressure diagram (see page 4). Richter should be consulted in case of different application parameters.

Choice of connection possibilities for sampling bottles

A spring-loaded threadless bottle clamping feature can also be provided in conjunction with a protective cabinet; see page 5.
Bottle connections: Standard GL to DIN 168 and customised special versions.