WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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Introduction

Parker FB Series Bellows Valves are designed to provide high integrity atmospheric sealing for severe service instrumentation applications. It includes a secondary packing that acts as a backup to the primary bellows seal.

Features

- Externally pressurized bellows stem seal
- Choice of Grafoil® or PTFE packing
- Packing acts as a secondary/backup seal above the primary bellows seal.
- Non-rotating stem tip
- Stem swivel and power threads above the primary seal
- Choice of blunt or regulating stem configurations
- 316SS construction
- 316L stainless steel bellows and welded components
- Wide variety of US Customary and SI ports
- Panel mountable
- 100% factory tested

Grafoil® is a registered trademark of GrafTech International Holdings, Inc.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Rating</td>
<td>2500 psig (172 bar) CWP</td>
</tr>
<tr>
<td>Temperature</td>
<td>CWP</td>
</tr>
<tr>
<td>PTFE packing</td>
<td>-65°F to 450°F (-54°C to 232°C)</td>
</tr>
<tr>
<td>Grafoil® packing</td>
<td>-65°F to 1000°F (-54°C to 538°C)</td>
</tr>
<tr>
<td>Orifice</td>
<td>0.172&quot; to 0.312&quot; (4.4mm to 7.9mm)</td>
</tr>
<tr>
<td>Cv</td>
<td>0.40 to 1.03</td>
</tr>
</tbody>
</table>

Pressure Rating and Tubing Selection

For working pressures of A-LOK® and CPI™ tube connections, please see the Instrumentation Tubing Selection Guide (Bulletin 4200-TS), found in the Technical Section of the Parker Instrumentation Products Master Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

For working pressures of valves with external or internal pipe threads, please see Catalog 4260, Instrumentation Pipe Fittings.
### Materials of Construction

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve Body *</td>
<td>ASTM A 479, type 316</td>
</tr>
<tr>
<td>2</td>
<td>Bonnet Nut</td>
<td>ASTM A 479, type 316</td>
</tr>
<tr>
<td>3</td>
<td>Bonnet</td>
<td>ASTM A 479, type 316</td>
</tr>
<tr>
<td>4</td>
<td>Bellows *</td>
<td>ASME SA 240, type 316L</td>
</tr>
<tr>
<td>5</td>
<td>Lower Stem *</td>
<td>ASTM A 479, type 316L</td>
</tr>
<tr>
<td>6</td>
<td>Weld Ring *</td>
<td>ASTM A 479, type 316L</td>
</tr>
<tr>
<td>7</td>
<td>Stem Tip *</td>
<td>ASTM A 479, type 316</td>
</tr>
<tr>
<td>8</td>
<td>Upper Stem</td>
<td>ASTM A 564, type 630</td>
</tr>
<tr>
<td>9</td>
<td>Ball</td>
<td>440-C Stainless Steel</td>
</tr>
<tr>
<td>10</td>
<td>Metal O-ring – upper</td>
<td>Alloy X-718 (Inconel®)</td>
</tr>
<tr>
<td>11</td>
<td>Metal O-ring – lower*</td>
<td>Alloy X-718 (Inconel®)</td>
</tr>
<tr>
<td>12</td>
<td>Packing Nut</td>
<td>ASTM A 479, type 316</td>
</tr>
<tr>
<td>13</td>
<td>Panel Nut</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>14</td>
<td>Lock Nut</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>15</td>
<td>Packing **</td>
<td>Grafoil®</td>
</tr>
<tr>
<td>16</td>
<td>Packing Washer</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>17</td>
<td>Spacer</td>
<td>ASTM A 479, type 316</td>
</tr>
<tr>
<td>18</td>
<td>Handle ***</td>
<td>316 Stainless Steel</td>
</tr>
<tr>
<td>19</td>
<td>Set Screw</td>
<td>316 Stainless Steel</td>
</tr>
</tbody>
</table>

* Wetted parts  
** Optional PTFE packing is available  
*** Handle material is aluminum in PTFE packed valves  

Lubrication: Molybdenum disulfide with soft metallic fillers

---

Grafoil® is a registered trademark of GrafTech International Holdings, Inc.  
Inconel® is a registered trademark of Special Metals Corp.
### FB Series Bellows Valve

<table>
<thead>
<tr>
<th>Basic Part Number</th>
<th>End Connections</th>
<th>Stem Type</th>
<th>Flow Data</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inlet (port 1)</td>
<td>outlet (port 2)</td>
<td>Orifice</td>
<td>CV</td>
</tr>
<tr>
<td>4A-FB8LR</td>
<td>1/4&quot; compression A-LOK®</td>
<td>regulating</td>
<td>0.172</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>0.46</td>
</tr>
<tr>
<td>4A-FB8LB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4Z-FB8LR</td>
<td>1/4&quot; compression CPI™</td>
<td>regulating</td>
<td>0.172</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>0.46</td>
</tr>
<tr>
<td>4F-FB8LR</td>
<td>1/4&quot; Female NPT</td>
<td>regulating</td>
<td>0.250</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>0.79</td>
</tr>
<tr>
<td>6A-FB8LR</td>
<td>3/8&quot; compression A-LOK®</td>
<td>regulating</td>
<td>0.250</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>0.79</td>
</tr>
<tr>
<td>6Z-FB8LR</td>
<td>3/8&quot; compression CPI™</td>
<td>regulating</td>
<td>0.250</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>0.79</td>
</tr>
<tr>
<td>6F-FB8LR</td>
<td>3/8&quot; Female NPT</td>
<td>regulating</td>
<td>0.312</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>1.03</td>
</tr>
<tr>
<td>8A-FB8LR</td>
<td>1/2&quot; compression A-LOK®</td>
<td>regulating</td>
<td>0.312</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>1.03</td>
</tr>
<tr>
<td>8A-FB8LB</td>
<td>1/2&quot; Female NPT</td>
<td>regulating</td>
<td>0.312</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>1.03</td>
</tr>
<tr>
<td>8F-FB8LR</td>
<td>1/2&quot; Tube socket weld</td>
<td>regulating</td>
<td>0.312</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>blunt</td>
<td></td>
<td>1.03</td>
</tr>
</tbody>
</table>
FB Series Bellows Valve

How to Order
The correct part number is easily derived from the following example and ordering chart. The six product characteristics required are coded as shown in the chart.

Example: 8Z – FB8 L R – G – SS

Describes an inline pattern FB Series Bellows Valve equipped with 1/2" CPI™ compression inlet and outlet ports, a regulating stem type, Grafoil® packing, stainless steel construction.

<table>
<thead>
<tr>
<th>Inlet Port*</th>
<th>Outlet Port*</th>
<th>Valve Series</th>
<th>Orientation</th>
<th>Stem Type</th>
<th>Packing</th>
<th>Body Material*</th>
</tr>
</thead>
<tbody>
<tr>
<td>4A</td>
<td>6A</td>
<td>8A</td>
<td>L</td>
<td>R</td>
<td>G</td>
<td>SS</td>
</tr>
<tr>
<td>4Z</td>
<td>6Z</td>
<td>8Z</td>
<td>L</td>
<td>R</td>
<td>G</td>
<td>SS</td>
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<tr>
<td>4F</td>
<td>6F</td>
<td>8F</td>
<td>L</td>
<td>R</td>
<td>G</td>
<td>SS</td>
</tr>
<tr>
<td>8W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*If the inlet and outlet ports are the same, eliminate the outlet port designator.

How to Order Additional Options
Oxygen Cleaning – Add the suffix -C3 to the end of the part number for receive valves cleaned and assembled for oxygen service in accordance with ASTM G 93 Level C.

How to Order Maintenance Kits
Stem Seal Kits: Consists of one bellows stem tip and maintenance instructions. Specify blunt or regulating stem tip.
   Example: KIT-FB8-TIP-R (regulating stem tip)
            KIT-FB8-TIP-B (blunt stem tip)

Bellows Kits: Consists of a welded bellows stem sub assembly, stem tip and maintenance instructions.
   Example: KIT-FB8-WSA-R (regulating stem tip)
            KIT-FB8-WSA-B (blunt stem tip)

Gasket Kits: Consists of one upper and lower metal o-ring and maintenance instructions.
   Example: KIT-FB8-GASKET
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2. Price Adjustments; Payments. Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may charge prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases, taxes, duties, laws, freight, or any change in the cost of any item, liability, insurance, or claims adjusted after delivery of the carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all taxes, duties or any other charges paid by Buyer, or incurred by Buyer, are the responsibility of Buyer.

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10. Special Tooling. A tooling charge may be imposed for any special tooling, including, but not limited to, dies, fixtures, molds, and tooling designs and availability with notice to Buyer. Such special tooling shall be and remain Seller’s property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in any special tooling which is utilized in the manufacture of the Product. If such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer, unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion.

11. Buyer’s Obligations; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its agent to execute and file on Buyer’s behalf all financing statements which Seller deems necessary to perfect its Security Interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller’s possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper Use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless against all loss, damages, liabilities, claims and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer’s employees, lessees, agents, licensees, or assignees, arising out of or in any manner in connection with the misuse of Products purchased by Seller from Buyer; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller’s use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture a Product, or (d) Buyer’s failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller’s written consent and upon terms and conditions specified by Seller. Buyer shall not be permitted to change any equipment, materials or accessories furnished by Seller unless Buyer obtains the prior written approval of Buyer. Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion.

14. Limitation of Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller. This agreement shall be binding upon and inure to the benefit of the successors and assigns of Seller and Buyer.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter hereunder are merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller’s right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full effect and force.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any of this agreement (b) the agreement of a trustee, receiver or custodian for all or any part of Buyer’s property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration. Notwithstanding the foregoing, disputes shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller’s obligation to defend Buyer and indemnify Buyer is contingent on Buyer not knowing of any infringement prior to the occurrence of the infringement. If Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may (a) stop the use of such Product; (b) replace the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price (c) make a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or in part by Buyer, or infringements resulting from the modification or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, retail, sales, use, or other taxes which may be imposed by any taxing authority on the manufacture, sale or delivery of Products.

21. Equal Opportunity Clause. Parker Hannifin Corporation and its subsidiaries and affiliates hereby state that in their employment practices, they will not discriminate against any employee or applicant for employment on the basis of race, color, religion, national origin, age, sex, marital status, or any other status approved by law.

Catalog 4145
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