General Description
Series FM Manapak double flow control valves permit free flow from the directional valve to the actuator and adjustable independent flow regulation in each return line from the actuator (meter-out). The FM2, and FM3 have a seal plate and can be inverted for meter-in applications (see installation drawing for flow direction).

Features
- Manapak style FM flow control valves can be provided in either single or double configurations.
- The flow controls may be positioned in 'A' port, 'B' port, both 'A' and 'B' ports or 'P' port.
- Valve bodies are manufactured from steel providing extra strength and durability for longer life. Internal hardened steel components also provide longer life.
- Two step needles provide fine adjustment for the first few turns and course adjustment for the last few turns. Standard and fine adjustment needles available.
- Large bypass checks allow high flow at a low pressure drop.
- Valve is reversible (invert 180°) for meter-in or meter-out applications (FM2 and FM3 only).
- Adjustment options include Allen hex or hand knob.

Performance Curves

Viscosity Correction Factor

<table>
<thead>
<tr>
<th>Viscosity (SSU)</th>
<th>75</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of ΔP (Approx.)</td>
<td>93</td>
<td>111</td>
<td>119</td>
<td>126</td>
<td>132</td>
<td>137</td>
<td>141</td>
</tr>
</tbody>
</table>
Manapak Sandwich Valves
Series FM

Ordering Information

Flow Valve

Size

Meter

Option

Needles

Adjustment

Seals

Code Description

Code Type

N Nitrile

V Fluorocarbon

Code Description

AA Single Function

A Port Only

BB Single Function

B Port Only

DD A and B Ports

Dual Function

PP** Single Function

P Port

* FM6 - Meter out only

** Not available on size 6.

Bold: Designates Tier I products and options.
Non-Bold: Designates Tier II products and options. These products will have longer lead times.

Manapak Bolt Kits

Size “2”

<table>
<thead>
<tr>
<th>No. of Manapaks</th>
<th>Manapak &amp; Valve Combination</th>
<th>Bolt</th>
<th>Bolt Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manapak &amp; D1</td>
<td>BK243</td>
<td>73.2 (2.88)</td>
</tr>
<tr>
<td>2</td>
<td>Manapak &amp; D1</td>
<td>BK225</td>
<td>111.3 (4.38)</td>
</tr>
<tr>
<td>3</td>
<td>Manapak &amp; D1</td>
<td>BK244</td>
<td>152.4 (6.00)</td>
</tr>
<tr>
<td>4</td>
<td>Manapak &amp; D1</td>
<td>BK245</td>
<td>190.5 (7.50)</td>
</tr>
</tbody>
</table>

Size “3”

<table>
<thead>
<tr>
<th>No. of Manapaks</th>
<th>Manapak &amp; Valve Combination</th>
<th>Bolt</th>
<th>Bolt Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manapak &amp; D3</td>
<td>BK141</td>
<td>88.9 (3.50)</td>
</tr>
<tr>
<td>2</td>
<td>Manapak &amp; D3</td>
<td>BK142</td>
<td>139.7 (5.50)</td>
</tr>
<tr>
<td>3</td>
<td>Manapak &amp; D3</td>
<td>BK143</td>
<td>190.5 (7.50)</td>
</tr>
</tbody>
</table>

* D31VW with internal pilot and internal drain only.

Size “6”

<table>
<thead>
<tr>
<th>No. of Manapaks</th>
<th>Manapak &amp; Valve Combination</th>
<th>Bolt</th>
<th>Bolt Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manapak &amp; D6</td>
<td>BK121</td>
<td>133.4 (5.25)</td>
</tr>
<tr>
<td>2</td>
<td>Manapak &amp; D6</td>
<td>BK122</td>
<td>203.2 (8.00)</td>
</tr>
<tr>
<td>3</td>
<td>Manapak &amp; D6</td>
<td>BK123</td>
<td>273.1 (10.75)</td>
</tr>
<tr>
<td>4</td>
<td>Manapak &amp; D6</td>
<td>BK124</td>
<td>342.9 (13.5)</td>
</tr>
</tbody>
</table>

Bolt Kits must be ordered separately.

Unit Weight:

FM2  1.7 kg (3.8 lbs.)
FM3  2.4 kg (5.2 lbs.)
FM6  7.9 kg (17.5 lbs.)

Schematics

AA Option

BB Option

DD Option

PP Option
Manapak Sandwich Valves
Series FM

FM3

FM3 Reverse Flow Check

Pressure Drop Reference Chart

<table>
<thead>
<tr>
<th>P</th>
<th>A</th>
<th>B</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
<td>*</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>DD</td>
<td>1</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>AA</td>
<td>1</td>
<td>*</td>
<td>1</td>
</tr>
<tr>
<td>BB</td>
<td>1</td>
<td>1</td>
<td>*</td>
</tr>
</tbody>
</table>

* See specific flow vs. turns chart

FM6

FM6 Reverse Flow Check

FM6 Standard Needle

Pressure Drop Reference Chart

<table>
<thead>
<tr>
<th>P</th>
<th>A</th>
<th>B</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
<td>*</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>DD</td>
<td>1</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>AA</td>
<td>1</td>
<td>*</td>
<td>1</td>
</tr>
<tr>
<td>BB</td>
<td>1</td>
<td>1</td>
<td>*</td>
</tr>
</tbody>
</table>

* See specific flow vs. turns chart
Dimensions

Inch equivalents for millimeter dimensions are shown in (**) 

Knob Option

Top View

BB Option

End View

Face View

Bottom View

Note: For meter-in option, invert body 180°.
Manapak Sandwich Valves

Series FM3

Dimensions

Inch equivalents for millimeter dimensions are shown in (**)

Knob Option

Top View

AA Option

End View

Face View

Bottom View

SHOWN WITHOUT O-RING PLATE
Dimensions

Inch equivalents for millimeter dimensions are shown in (**)

Knob Option

Top View

Face View

End View

Bottom View