DESCRIPTION

The Bettis Multiport Flow Selector provides a cost effective method for selecting and diverting well fluids from an individual well to a single test outlet or loop. Connecting up to eight flow lines, the Multiport Flow Selector allows the combined well fluids to flow through a separate group outlet, while simultaneously isolating any single well for testing. The unique flow selector is ideal for operation in a variety of oil and gas or process applications.

FEATURES

- Reduced operating and maintenance costs
- Can be operated manually or electrically
- Compact manifold with reduced size and weight
- Electric operators can be supplied with either AC or DC motors and mechanical limit switches or the popular Bettis Multiport Electronic Controller (MEC)
- Manufactured in accordance with ASME B16.34
- Field adjustable seal, with stainless steel scraper for extended service life
- Fire tested to API 6FA
- Especially suited for use with Multiphase meters

SPECIFICATIONS

- Body and bolting material — See page 7
- Seal material — See page 7
- Motor — 1/4 HP–1/3 HP, 115/230 VAC-24VDC, 1725 RPM, TEFC
- Gear reducer — double reduction worm, oil bath, 1200:1; 1.4 RPM plug rotation
- Plug position accuracy ± 2° or less
- Bettis Switchpak model SW28D-BCT — CSA, CL. I, DIV 1, GR. C AND D, LR 59482 and Exd IIB T6 Category 2 (Pending)
- Push Button Station (optional)
- Multiport Electronic Controller (MEC) — optional
- Digital Display Station (optional)

OPTIONS

- Various sizes and ratings of line flanges available
- Sour service trim
- Various internal coatings and overlays available for enhanced abrasion and corrosion resistance, eg: Nickel Plate, Inconel, Stellite, Impreglon
- Various seal material combinations available for adverse service conditions
- Available with third party certification, such as DNV, either job specific or type approval
MULTIPORT FLOW SELECTOR TYPICAL OUTLINE DIMENSIONS

5.0 [127] VERTICAL CLEARANCE FOR SWITCHPAK COVER REMOVAL

TYPICAL ONE MAIN ENTRY 1 NPT AND FOUR @ 1/2 NPT AUXILIARY ENTRIES PROVIDED FOR FIELD WIRING

NPS G SCH J ONE OF EIGHT

NPS H Sch J

NPS G SCH J
### MULTIPORT FLOW SELECTOR TYPICAL DIMENSIONAL DATA

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>4x8 300</td>
<td>15.6 [396]</td>
<td>19.3 [490]</td>
<td>18.6 [472]</td>
<td>22.0 [559]</td>
<td>59.8 [1519]</td>
<td>30.1 [765]</td>
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<td>8</td>
<td>80</td>
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<td>16.4 [417]</td>
<td>20.4 [518]</td>
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<td>22.9 [582]</td>
<td>60.6 [1539]</td>
<td>30.1 [765]</td>
<td>4</td>
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<td>2045 [930]</td>
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<tr>
<td>4x10 900</td>
<td>18.4 [467]</td>
<td>25.6 [650]</td>
<td>19.6 [498]</td>
<td>25.6 [650]</td>
<td>70.4 [1788]</td>
<td>34.6 [879]</td>
<td>4</td>
<td>10</td>
<td>160</td>
<td>3005 [1366]</td>
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<tr>
<td>6x16 150</td>
<td>20.3 [516]</td>
<td>27.7 [704]</td>
<td>19.6 [498]</td>
<td>33.4 [848]</td>
<td>77.9 [1979]</td>
<td>34.6 [879]</td>
<td>6</td>
<td>16</td>
<td>80</td>
<td>3475 [1580]</td>
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<td>28.9 [734]</td>
<td>19.6 [498]</td>
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<td>80</td>
<td>3745 [1703]</td>
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<td>79.3 [2014]</td>
<td>34.6 [879]</td>
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<td>16</td>
<td>80</td>
<td>4135 [1880]</td>
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</table>

**NOTE:**
1) WEIGHTS LISTED ARE FOR ASSEMBLIES INCLUDING ELECTRIC ACTUATOR AND RFWN FLANGES
2) THREADED OR BEVELED END CONNECTIONS ARE AVAILABLE
MULTIPORT FLOW SELECTOR TYPICAL PERFORMANCE DATA

<table>
<thead>
<tr>
<th>SIZE &amp; ASME CLASS</th>
<th>SHELL PRESSURE RATING AT</th>
<th>MAXIMUM STATIC TEST-TO-GROUP SEAT DIFFERENTIAL RATING AT 100 °F [38°C]</th>
<th>MAXIMUM STATIC GROUP-TO-TEST SEAT DIFFERENTIAL RATING AT 100 °F [38°C]</th>
<th>MAXIMUM DYNAMIC SEAT DIFFERENTIAL RATING AT 160 °F [71°C]</th>
<th>BREAKAWAY TORQUE AT MAXIMUM DYNAMIC SEAT DIFFERENTIAL</th>
<th>TEST OUTLET Cv</th>
<th>GROUP OUTLET Cv</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>PSI [BAR]</td>
<td>PSI [BAR]</td>
<td>PSI [BAR]</td>
<td>FT-LB [N-m]</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2x4 600</td>
<td>1480 [100]</td>
<td>1200 [80]</td>
<td>900 [60]</td>
<td>600 [40]</td>
<td>125 [170]</td>
<td>67</td>
<td>262</td>
</tr>
<tr>
<td>3x6 1500</td>
<td>3705 [250]</td>
<td>1200 [80]</td>
<td>900 [60]</td>
<td>600 [40]</td>
<td>200 [272]</td>
<td>100</td>
<td>429</td>
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<tr>
<td>4x10 900</td>
<td>2220 [150]</td>
<td>1000 [70]</td>
<td>1000 [70]</td>
<td>700 [50]</td>
<td>400 [544]</td>
<td>217</td>
<td>1292</td>
</tr>
<tr>
<td>4x10 1500</td>
<td>3705 [250]</td>
<td>1000 [70]</td>
<td>1000 [70]</td>
<td>700 [50]</td>
<td>400 [544]</td>
<td>217</td>
<td>1292</td>
</tr>
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</table>

**NOTE:**
1) STATIC DIFFERENTIAL RATINGS LISTED ARE BASED ON DESIGN LIMIT OF RESILIENT SEAT INSERT
2) DYNAMIC DIFFERENTIAL RATINGS LISTED ARE BASED ON DESIGN LIMIT OF RESILIENT SEAT INSERT AND THE TORQUE RATING OF THE SPEED REDUCER
3) SEAT LEAKAGE PERFORMANCE MEETS CLASS IV ANSI/FCI 70-2 (≤ 0.01% OF TEST OUTLET Cv)
4) BREAKAWAY TORQUES LISTED ARE TYPICAL FOR CLEAN LIQUID HYDROCARBON SERVICE
5) Cv VALUES LISTED BASED ON TESTING PERFORMED TO ISA-S75.02
## MULTIPORT FLOW SELECTOR TYPICAL MATERIAL DATA

<table>
<thead>
<tr>
<th>MAJOR COMPONENT DESCRIPTION</th>
<th>STANDARD TRIM</th>
<th>NACE TRIM</th>
<th>LOW TEMPERATURE TRIM</th>
<th>LOW TEMPERATURE NACE TRIM</th>
<th>STAINLESS STEEL TRIM</th>
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<tbody>
<tr>
<td>BODY</td>
<td>A216-WCB</td>
<td>A351-LCC</td>
<td>A351-LCC</td>
<td>A351-CF3M</td>
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<tr>
<td>LINE FLANGE</td>
<td>A105</td>
<td>A105</td>
<td>A350-LF2</td>
<td>A350-LF2</td>
<td>A351-CF3M</td>
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<tr>
<td>BONNET</td>
<td>A516-70</td>
<td>A516-70</td>
<td>A516-70</td>
<td>A516-70</td>
<td>A351-CF3M</td>
</tr>
<tr>
<td>BONNET STUD</td>
<td>A193-B7</td>
<td>A193-B7M</td>
<td>A320-L7</td>
<td>A320-L7M</td>
<td>A320-B8 CL1</td>
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<tr>
<td>BONNET NUT</td>
<td>A194-2H</td>
<td>A194-2HM</td>
<td>A194-L7</td>
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<td>A194-8F</td>
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<tr>
<td>BONNET O-RING</td>
<td>AFLAS</td>
<td>AFLAS</td>
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<tr>
<td>PLUG O-RING</td>
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<tr>
<td>SEAT RING</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
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<td>SEAT INSERT</td>
<td>PTFE-25% C</td>
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<td>SEAT O-RING</td>
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<tr>
<td>BACKUP PLATE</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
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<td>SCRAPER</td>
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<td>T630 (17-4PH)</td>
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<td>T630 (17-4PH)</td>
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<td>ADJUSTMENT NUT</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
<td>T630 (17-4PH)</td>
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</table>

**NOTE:**

1) DESIGN AND MATERIALS OF CONSTRUCTION BASED ON ASME B16.34

2) CANADIAN DESIGN REGISTRATION FILE CRN OC1572.2
The Bettis Multiport Electronic Controller (MEC) is a microprocessor-based system designed specifically to control and monitor the status of the Multiport Flow Selector. The MEC contains an absolute optical encoder allowing the monitoring of the rotor position to a fraction of a degree, retaining the memory of the position even without power. The controller card microprocessor analyzes input from the encoder and the host computer to accurately position the valve’s rotor.

**DESCRIPTION**

- The standard system uses a simple ASCII (MP-08) or Modbus RTU (MP-800) format connected via a selectable jumper RS232 or RS485 connection
- Compensates for torque requirement changes for accurate positioning regardless of valve conditions
- Jumpers can disable any valve ports not being utilized
- Less installation wiring requiring when compared to standard electric motor operator

**FEATURES**

- Pushbuttons can override CPU enabling the re-setting of home port, return to home port and jog
- Can be equipped with optional digital display indicating valve position
- Allows alternate protocols, such as Allen-Bradley, to be readily developed for existing systems
- One physical setting required to position plug at 8 ports, versus 8 independent settings when compared to standard electric motor operator with mechanical limit switches

**Commands**

- “Remote” or “Local” modes of operation.
- “Jog” or “Step” commands are enabled in the “Local” mode and may be used to position the MPFS by on-site personnel
- “Move” command is enabled in the “Remote” mode and is used to remotely position the MPFS to any port
- “Stop” command is enabled in the “Remote” mode and is used to remotely stop the MPFS from moving

**Diagnostics**

- “Equipment Failure” diagnostic feature detects faulty positioning
- “Go To Homeport Timeout” diagnostic feature detects faulty communication, and in that event positions the MPFS to Home Port
- “Number of Port Changes” diagnostic feature counts the total number of port changes completed, the count may be reset to zero at any time
Hazardous Location: Class 1 Div. 1; GR. C & D  
EEx d IIB T3, IP55  
EExd IIB T6, Category 2 (Pending)

Input Voltage Options:  
1. 48 – 240 VAC (50 – 60 HZ) Uses Solid State AC Relay and Transformer  
2. 6 – 100 VDC Uses Solid State DC Relay and Regulator if Required

Board Voltage: 8 – 30 VDC or 9 – 20 VAC

Board Current: 0.5 AMP MAX

Fuse: 1 AMP Time Delay

Temperature Rating: -40°F to +212°F (-40°C to +100°C)

Board: Conformally Coated  
Lightning Protected

Protocol: ASCII, Modbus RTU  
Windows Based Software Supplied

Communications: 9600 BAUD, 8-Bits  
No Parity, 1 Stop Bit
SW2 SWITCHPAK – (MECHANICAL TYPE)

SWITCHPAK ROTARY POSITION INDICATING SWITCH, MODEL SW28D-BCT, IS SUPPLIED WITH 8 SWITCHES, ADJUSTABLE THROUGH 360° OF SHAFT ROTATION. THE ENCLOSURE IS SUITABLE FOR INSTALLATION IN CLASS 1 DIV. 1 GROUP C & D HAZARDOUS LOCATIONS.

NOTES:
1. SHOWN WITH PLUG AT PORT NO. 1 REMOTE MODE
2. ‘LS1’ FOR PORT NO. 1 ARE ACTUATED
3. COMMAND AND INDICATION CIRCUITS MUST BE THE SAME VOLTAGE
4. FOR CCW ROTATION OF PLUG, POSITIVE ‘+’ VOLTAGE MUST BE CONNECTED TO TERMINAL #13
5. ENERGIZE COMMAND CIRCUIT NO. 2 TO MOVE TO PORT NO. 2
6. TO ENGAGE STEPPING COMMAND:
   - SWITCH TO LOCAL MODE
   - PRESS AND HOLD (APPROX. 5 SEC OR UNTIL PLUG POINTER TRAVEL 75% TOWARDS NEXT PORT)
   - STEPPING SWITCH MOMENTARILY, THEN RELEASE
**ORDERING GUIDE – Multiport Flow Selector Specification Sheet**

**CUSTOMER**

**PROJECT**

**LOCATION**

**PROVINCE/STATE**

** QuânITY**

<table>
<thead>
<tr>
<th>OPERATING CONDITIONS</th>
<th>TEMP: MIN</th>
<th>TEMP: NORM</th>
<th>TEMP: MAX</th>
<th>P MAX</th>
<th>(psi)</th>
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<tbody>
<tr>
<td>PRESSURE:</td>
<td>MIN. (psig)</td>
<td>MAX. (psig)</td>
<td>GROUP TO TEST</td>
<td>TEST TO GROUP</td>
<td>OTHER</td>
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<tr>
<td>INLET PORT</td>
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<tr>
<td>TEST PORT</td>
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<tr>
<td>GROUP PORT</td>
<td></td>
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</tbody>
</table>

**FLOW SELECTOR SPECIFICATION AND MATERIALS**

**SIZE**

**BODY**

**O-RING/BUSHING**

**CONNECTIONS:**

**INLET**

**TEST**

**GROUP**

**OTHER**

*(Specify Insp. Port No. and size if required)*

**PAINT STD.**

**OPERATOR SPECIFICATIONS**

**MANUAL LEVER LOCK**

**STANDARD PORT ORIENTATION**

**PLUG ROTATION CCW UNLESS OTHERWISE SPECIFIED.**

**MOTOR VOLTAGE/PHASE**

**CONTROL VOLTAGE**

**SWITCH/PACK MODEL**

**HEATER/TERM.**

**WIRING SCHEMATIC #**

**NOTES**

**REV. SYMBOL-BY-DATE:**

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