4-Port Solenoid Valve Cassette Type Manifold

The SJ3000, SJ2000 and SJ1000 can be mounted together.

Valve width
A 6.5 mm type has been added.

Manual locking
Unintentional manual override operations are prevented by a sliding mechanism which covers and prevents the switch from accidentally being pressed manually.

Connector type (Card edge type)
- It is easy to replace valves and increase or decrease the number of stations.
- The 34-pin connector allows for the connection of up to 16 stations with double solenoids, 32 stations with single solenoids.

SJ1000-X1 Series

Flow Rate Characteristics

<table>
<thead>
<tr>
<th>Series</th>
<th>C[dm^3/(s·bar)]</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJ1000</td>
<td>0.32 ( \Phi 4 )</td>
<td></td>
</tr>
<tr>
<td>SJ2000</td>
<td>0.36 ( \Phi 4 )</td>
<td></td>
</tr>
<tr>
<td>SJ3000</td>
<td>0.56 ( \Phi 6 )</td>
<td></td>
</tr>
</tbody>
</table>

* 4/2 → 3/5 (A/B → E)

D-sub connector
Flat ribbon cable
Mountable serial transmission system
EX180 Integrated Type (For Output)
EX510 Gateway Type
Serial transmission system
### Manifold Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>D-sub connector</th>
<th>Flat ribbon cable</th>
<th>Serial wiring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type 60F</td>
<td>Type 60P</td>
<td>Type 60PG</td>
</tr>
<tr>
<td>Manifold type</td>
<td>Plug-in</td>
<td>Connector type</td>
<td>Common SUP, EXH</td>
</tr>
<tr>
<td>1(P: SUP), 3/5(E: EXH)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve stations</td>
<td>1 to 24 stations</td>
<td>1 to 18 stations</td>
<td>1 to 8 stations</td>
</tr>
<tr>
<td>Applicable connector</td>
<td>D-sub connector</td>
<td>Flat ribbon cable connector</td>
<td>Flat ribbon cable connector</td>
</tr>
<tr>
<td></td>
<td>Compliant with MIL-C-24308</td>
<td>Socket: 26-pin MIL type with strain relief</td>
<td>Socket: 20-pin MIL type with strain relief</td>
</tr>
<tr>
<td></td>
<td>JIS-X-5101</td>
<td>Compliant with MIL-C-83503</td>
<td>Compliant with MIL-C-83503</td>
</tr>
<tr>
<td>Internal wiring</td>
<td>Connector type: Positive common, Negative common</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4(A), 2(B) port piping specification</td>
<td>Location</td>
<td>Valve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Direction</td>
<td>Horizontal</td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>1(P), 3/5(E) port</td>
<td>C6, C8, N7, N9 (Inch size elbow fitting is not available.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4(A), 2(B) port</td>
<td>C2, C4</td>
<td></td>
</tr>
<tr>
<td>Weight W [g](^{\ast 1})</td>
<td>(W = 51n + m + 133)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(n: \) Number of SUP/EXH blocks \(m: \) Weight of DIN rail

\(\ast 1\) The weight W is the value for the D-sub connector manifold only with internal pilot, SUP/EXH block straight fittings specifications. To obtain the weight with solenoid valves attached, add the solenoid valve weights given on page 2 and Web Catalog for the appropriate number of stations. Refer to the Web Catalog for the weight of DIN rail. (Please contact SMC for the weight of external pilot specification, elbow fittings.)

\(\ast\) When many valves are operated simultaneously, use B type (SUP/EXH both sides), applying pressure to the 1(P) ports on both sides and exhaust from the 3/5(E) ports on both sides.

Specifications not listed are the same as those of the standard product.

For details, refer to the Web Catalog.
Flow Rate Characteristics

<table>
<thead>
<tr>
<th>Port size</th>
<th>Flow rate characteristics</th>
<th>1 → 2/4 (P → A/B)</th>
<th>C(μm²/s·bar)</th>
<th>b</th>
<th>Cv</th>
<th>4/2 → 3/5 (A/B → E)</th>
<th>C(μm²/s·bar)</th>
<th>b</th>
<th>Cv</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(P) 3/5(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A, B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>0.12</td>
<td>0.64</td>
<td>0.04</td>
<td></td>
<td></td>
<td></td>
<td>0.13</td>
<td>0.59</td>
<td>0.04</td>
</tr>
<tr>
<td>C4</td>
<td>0.28</td>
<td>0.35</td>
<td>0.08</td>
<td></td>
<td></td>
<td></td>
<td>0.32</td>
<td>0.33</td>
<td>0.08</td>
</tr>
</tbody>
</table>

* The value is for manifold base with 5 stations and individually operated 2-position type.
Please contact SMC for 3-position type.

Solenoid Valve Specifications

- Fluid
  - Air
- Internal pilot operating pressure range [MPa]
  - 2-position single: 0.15 to 0.7
  - 2-position double: 0.1 to 0.7
  - 3-position: 0.2 to 0.7
- External pilot operating pressure range [MPa]
  - Operating pressure range: −100 kPa to 0.7
  - Pilot pressure range
    - 2-position single: 0.25 to 0.7
    - 2-position double
    - 3-position
- Ambient and fluid temperatures [°C]
  - −10 to 50 (No freezing)
- Max. operating frequency [Hz]
  - 2-position single, double: 10
  - 3-position: 3
- Manual override (Manual operation)
  - Non-locking push type
- Pilot exhaust method
  - Internal pilot: Main and pilot valve common exhaust
  - External pilot: Pilot valve individual exhaust
- Lubrication
  - Not required
- Mounting orientation
  - Unrestricted
- Impact/Vibration resistance [m/s²]
  - 150/30
- Enclosure
  - Dustproof

* Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Value in the initial state)

Vibration resistance: No malfunction occurred in one sweep test between 45 and 2000 Hz in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states for each condition. (Value in the initial state)

Response Time

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Response time [ms] (at 0.5 MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-position single</td>
<td>16 or less</td>
</tr>
<tr>
<td>2-position double</td>
<td>10 or less</td>
</tr>
<tr>
<td>3-position</td>
<td>34 or less</td>
</tr>
</tbody>
</table>

* JIS B8419: 2010 Based on dynamic performance test (Coil temperature: 20°C, at rated voltage)
  JIS B8373: 2015

Weight

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Port size</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>C2</td>
<td>34</td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>3-position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td>C2</td>
<td>41</td>
</tr>
<tr>
<td>Exhaust center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>C4</td>
<td>36</td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>3-position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td>C4</td>
<td>43</td>
</tr>
<tr>
<td>Exhaust center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* JIS B8419: 2010 Based on dynamic performance test (Coil temperature: 20°C, at rated voltage)
SJ1000-X1 Series

Dimensions

SUP/EXH block: U side

(Distance n)→(Distance 1)

[Flat ribbon cable]

One-touch fitting
1(P), 3(5)(E) port
Applicable tubing O.D.: ø8, ø5/16

L3

Valve lock switch

Manual override switch

[External pilot specification]

One-touch fitting
(PE: Pilot EXH port)
Applicable tubing O.D.: ø4, ø5/32

L3

Switch for locking a connector

Applicable connector: D-sub

L1

Connector entry

L2

Light/surge voltage suppressor

SOL.a: Orange

SOL.b: Green

U side

4(A) port side: Blue

2(B) port side: Yellow

One-touch fitting

Applicable tubing O.D.: ø2, ø4

Applicable tubing O.D.: ø4, ø5/32

Connector entry direction: Upward

Calculation formula for dimensions

<table>
<thead>
<tr>
<th>D-sub connector</th>
<th>Flat ribbon cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3 = 6.5 x n1 + 57.8</td>
<td>L3 = 6.5 x n1 + 57.8</td>
</tr>
<tr>
<td>M = (L3 + 5.9)/12.5 + 1</td>
<td>M = (L3 + 6.6)/12.5 + 1</td>
</tr>
<tr>
<td>L1 = M x 12.5 + 23</td>
<td>L1 = M x 12.5 + 23</td>
</tr>
<tr>
<td>L2 = L1 – 10.5</td>
<td>L2 = L1 – 10.5</td>
</tr>
<tr>
<td>L4 = (L1 – L3 + 5.9)/2</td>
<td>L4 = (L1 – L3 + 6.6)/2</td>
</tr>
</tbody>
</table>

EX180

L3 = 6.5 x n1 + 88.2

M = L3/12.5 + 1

L1 = M x 12.5 + 23

L2 = L1 – 10.5

L4 = (L1 – L3)/2

EX510

L3 = 6.5 x n1 + 105.4

M = L3/12.5 + 1

L1 = M x 12.5 + 23

L2 = L1 – 10.5

L4 = (L1 – L3)/2

n1 = Number of SJ1000

* This drawing shows the D-sub connector.

Applicable connector: 26-pin MIL type with strain relief (Compliant with MIL-C-83503)

Triangle mark

One-touch fitting

PE: Pilot EXH port
Applicable tubing O.D.: ø4, ø5/32

Connector entry direction: Upward

Applicable connector: D-sub (JIS-X-5101/MIL-C-24308) equivalent

Valve lock switch
**Dimensions**

**SUP/EXH block: Both sides**

- **4-Port Solenoid Valve Cassette Type Manifold SJ1000-X1 Series**
- **Calculation formula for dimensions**
  - **D-sub connector**
    - \( L_3 = 6.5 \times n_1 + 73.3 \)
    - \( M = (L_3 + 5.9)/12.5 + 1 \) (Decimal fractions are truncated.)
    - \( L_1 = M \times 12.5 + 23 \)
    - \( L_2 = L_1 - 10.5 \)
    - \( L_4 = (L_1 - L_3 + 5.9)/2 \)
  - **EX180**
    - \( L_3 = 6.5 \times n_1 + 103.7 \)
    - \( M = L_3/12.5 + 1 \) (Decimal fractions are truncated.)
    - \( L_1 = M \times 12.5 + 23 \)
    - \( L_2 = L_1 - 10.5 \)
    - \( L_4 = (L_1 - L_3)/2 \)
  - **Flat ribbon cable**
    - \( L_3 = 6.5 \times n_1 + 73.3 \)
    - \( M = (L_3 + 5.9)/12.5 + 1 \) (Decimal fractions are truncated.)
    - \( L_1 = M \times 12.5 + 23 \)
    - \( L_2 = L_1 - 10.5 \)
    - \( L_4 = (L_1 - L_3 + 5.9)/2 \)
  - **EX510**
    - \( L_3 = 6.5 \times n_1 + 120.9 \)
    - \( M = L_3/12.5 + 1 \) (Decimal fractions are truncated.)
    - \( L_1 = M \times 12.5 + 23 \)
    - \( L_2 = L_1 - 10.5 \)
    - \( L_4 = (L_1 - L_3)/2 \)

- **n1 = Number of SJ1000**

- **4-Port Solenoid Valve Cassette Type Manifold**

- **SJ1000-X1 Series**

- **Applicable connector:** D-sub JIS-X-5101 (MIL-C-24308) equivalent

- **Applicable tubing O.D.: \( \varnothing \) 2, \( \varnothing \) 4**

- **Applicable connector:** 26-pin MIL type with strain relief (Compliant with MIL-C-83503)

- **Triangle mark**

- **One-touch fitting**
  - [P], [S/E] (Port)
  - [2(A), 2(B) port]
  - Applicable tubing O.D.: \( \varnothing \) 2, \( \varnothing \) 4

- **Valve lock switch**
  - \( L_3 = 6.5 \times n_1 + 73.3 \)
  - \( M = (L_3 + 6.6)/12.5 + 1 \) (Decimal fractions are truncated.)
  - \( L_1 = M \times 12.5 + 23 \)
  - \( L_2 = L_1 - 10.5 \)
  - \( L_4 = (L_1 - L_3 + 6.6)/2 \)

- **Applicable connector:** 26-pin MIL type with strain relief (Compliant with MIL-C-83503)

- **Triangle mark**

- **Applicable connector:** D-sub JIS-X-5101 (MIL-C-24308) equivalent

- **Applicable tubing O.D.: \( \varnothing \) 4, \( \varnothing \) 5/32"**

- **Applicable connector for locking a connector**
  - [P], [S/E] (Port)
  - Applicable tubing O.D.: \( \varnothing \) 8, \( \varnothing \) 5/16"
Dimensions: SJ1000/2000/3000 Mixed Manifold

SUP/EXH block: U side

Calculation formula for dimensions

**D-sub connector**
- \( \text{L3} = 6.5 \times \text{n1} + 7.5 \times \text{n2} + 10 \times \text{n3} + 57.8 \)
- \( \text{M} = (\text{L3} + 9.9)/12.5 + 1 \)  Decimal fractions are truncated.
- \( \text{L1} = \text{M} \times 12.5 + 23 \)
- \( \text{L2} = \text{L1} - 10.5 \)
- \( \text{L4} = (\text{L1} - \text{L3})/2 + 1 \)

**EX180**
- \( \text{L3} = 6.5 \times \text{n1} + 7.5 \times \text{n2} + 10 \times \text{n3} + 88.2 \)
- \( \text{M} = (\text{L3} + 4)/12.5 + 1 \)  Decimal fractions are truncated.
- \( \text{L1} = \text{M} \times 12.5 + 23 \)
- \( \text{L2} = \text{L1} - 10.5 \)
- \( \text{L4} = (\text{L1} - \text{L3})/2 - 2 \)

**Flat ribbon cable**
- \( \text{L3} = 6.5 \times \text{n1} + 7.5 \times \text{n2} + 10 \times \text{n3} + 57.8 \)
- \( \text{M} = (\text{L3} + 10.6)/12.5 + 1 \)  Decimal fractions are truncated.
- \( \text{L1} = \text{M} \times 12.5 + 23 \)
- \( \text{L2} = \text{L1} - 10.5 \)
- \( \text{L4} = (\text{L1} - \text{L3})/2 + 1.3 \)

**EX510**
- \( \text{L3} = 6.5 \times \text{n1} + 7.5 \times \text{n2} + 10 \times \text{n3} + 105.4 \)
- \( \text{M} = (\text{L3} + 4)/12.5 + 1 \)  Decimal fractions are truncated.
- \( \text{L1} = \text{M} \times 12.5 + 23 \)
- \( \text{L2} = \text{L1} - 10.5 \)
- \( \text{L4} = (\text{L1} - \text{L3})/2 - 2 \)

\( n1 = \) Number of SJ1000
\( n2 = \) Number of SJ2000
\( n3 = \) Number of SJ3000

* The dimensions of L1 to L4 for SS5J3-M60D1/2-StationU are the same as those of SS5J3-M60D1/2-StationU.
### Dimensions: SJ1000/2000/3000 Mixed Manifold

**SUP/EXH block: Both sides**

- **D-sub connector**
  - \( L_3 = 6.5 \times n_1 + 7.5 \times n_2 + 10 \times n_3 + 73.3 \)
  - \( M = (L_3 + 9.9) \times 12.5 \times 1 + \text{Decimal fractions are truncated} \)
  - \( L_1 = M \times 12.5 + 23 \)
  - \( L_2 = L_1 - 10.5 \)
  - \( L_4 = (L_1 - L_3)/2 + 1 \)
  - **EX180**
    - \( L_3 = 6.5 \times n_1 + 7.5 \times n_2 + 10 \times n_3 + 103.7 \)
    - \( M = (L_3 + 4) \times 12.5 \times 1 + \text{Decimal fractions are truncated} \)
    - \( L_1 = M \times 12.5 + 23 \)
    - \( L_2 = L_1 - 10.5 \)
    - \( L_4 = (L_1 - L_3)/2 - 2 \)

- **Flat ribbon cable**
  - \( L_3 = 6.5 \times n_1 + 7.5 \times n_2 + 10 \times n_3 + 73.3 \)
  - \( M = (L_3 + 10.6) \times 12.5 \times 1 + \text{Decimal fractions are truncated} \)
  - \( L_1 = M \times 12.5 + 23 \)
  - \( L_2 = L_1 - 10.5 \)
  - \( L_4 = (L_1 - L_3)/2 + 1.3 \)
  - **EX510**
    - \( L_3 = 6.5 \times n_1 + 7.5 \times n_2 + 10 \times n_3 + 120.9 \)
    - \( M = (L_3 + 4) \times 12.5 \times 1 + \text{Decimal fractions are truncated} \)
    - \( L_1 = M \times 12.5 + 23 \)
    - \( L_2 = L_1 - 10.5 \)
    - \( L_4 = (L_1 - L_3)/2 - 2 \)

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**Safety Instructions**

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

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