Before use, be sure to read the “Safety Precautions” on p. 31.
Reliability & Versatile Application

Solenoid Valves 180 Series

The 180 series Solenoid Valves, which achieve highly reliable, powerful, and low current basic performance in a compact, thin body, offer a simple and flexible standard type, and a full-option type with advanced maintenance features, to become still more user-friendly.

**Standard type**
Its clean lines emphasize basic performance, for low-cost and versatile applications.

- With a varistor for the AC type, and a flywheel diode for the DC type, the solenoid is equipped with excellent surge suppression measures.

- A manual override (non-locking type) is standard equipment and offers easy adjustment during assembly and maintenance. A fingertip-operable protruding-type manual override (locking type) is also available as an option.

**Full-option type**
Greatly improves piping and wiring work efficiency, for excellent applications in assembly, adjustment, and maintenance.

- Equipped with an easy-to-handle plug connector for fast wiring installation and removal. Available in a straight type and L type, both are equipped with LED indicators for easy confirmation of operations.

- Built-in quick fittings offer one-touch simple tube installation and removal. Moreover, an effective area of 9.6mm² (Cv: 0.53), ensures even more powerful applications.

- The common terminal pre-wired plug connector type frees technicians from tedious common terminal wiring work. Crossover wires are used to connect the common terminals, so that a single common wire is sufficient even for a manifold with many stations.

- Piping to the pilot exhaust ports is also possible to keep the control box interior and working environment from becoming contaminated. The built-in check mechanism prevents exhaust interference.

**F type manifold**
Direct piping type valves can be mounted directly on this manifold. An FE type manifold enabling collected pilot exhaust through its PR port is also available.

**AJ type manifold**
Combines all ports into a manifold base. Quick fittings are built into the delivery ports (4(A), 2(B)), allowing easy assembly and maintenance in a confined space.
Twin Solenoid Valve

Ensures the functions of the conventional double solenoid type, but in a much shorter length, while simple wiring enables correct connections with a sequencer. Moreover, it is capable of being installed on a conventional manifold to occupy space for two stations.

Tandem Solenoid Valve

Retains the performance specifications of the 180 series while realizing a two-unit combination solenoid in the space of a single station. Achieves a compact outer appearance for the manifold and still more space savings.
### 180 Series Basic Models and Configuration

#### Single unit

<table>
<thead>
<tr>
<th></th>
<th>2-, 3-port</th>
<th>5-port</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct piping</strong></td>
<td><img src="image1" alt="Diagram" /> Normally closed (NC) <img src="image2" alt="Diagram" /> Normally open (NO)</td>
<td><img src="image3" alt="Diagram" /> Normally closed (NC) <img src="image4" alt="Diagram" /> Normally open (NO)</td>
</tr>
<tr>
<td><strong>Sub-base piping</strong></td>
<td><img src="image5" alt="Diagram" /> A181E1-25 A181E1-11-25</td>
<td><img src="image6" alt="Diagram" /> A180-4E1 180-4E2 183-4E2 183-4E2-13 183-4E2-14</td>
</tr>
<tr>
<td></td>
<td><img src="image7" alt="Diagram" /> 180-4E1 <img src="image8" alt="Diagram" /> 183-4E2 <img src="image9" alt="Diagram" /> 183-4E2-13 <img src="image10" alt="Diagram" /> 183-4E2-14</td>
<td><img src="image11" alt="Diagram" /> 180-4E1 <img src="image12" alt="Diagram" /> 180-4E2 <img src="image13" alt="Diagram" /> 183-4E2-13 <img src="image14" alt="Diagram" /> 183-4E2-14</td>
</tr>
</tbody>
</table>

**Notes:**
1. 180E1 and A180E1 are dedicated valves for manifolds with combination mounting of 2-, 3-, 5-port valves. They cannot be used as single units. When using 2-, 3-port valves as single units, use 181E1 or A181E1-25.
2. They are dedicated twin solenoid valves for manifolds with combination mounting of 2-, 3-, 5-port valves. They cannot be used as single units.
<table>
<thead>
<tr>
<th>Small sized manifold for 2-, 3-port valves</th>
<th>Manifold for combination mounting of 2-, 3-, 5-port valves</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>181M □ □ F</strong>—F type (1(P), 3(R)) manifold</td>
<td><strong>180M □ □ F</strong>—F type (1(P), 3(R2), 5(R1)) manifold</td>
</tr>
<tr>
<td>![181M □ □ F] 181E1 181E1-11 3(R) 1(P)</td>
<td>![180M □ □ F] 183-4E2, 183-4E2-13, 183-4E2-14 180-4E2 180E1 180E1-11 (dedicated 2-, 3-port valves for manifold use) 5(R2) 1(P) 3(R2)</td>
</tr>
<tr>
<td><strong>181M □ □ A</strong>—A type (all ports) manifold</td>
<td><strong>180M □ □ FE</strong>—FE type (1(P), 3(R2), 5(R1), PR) manifold</td>
</tr>
<tr>
<td>![181M □ □ A] A181E1 A181E1-11 PR 3(R) 1(P) 2(A)</td>
<td>![180M □ □ FE] 183-4E2, 183-4E2-13, 183-4E2-14 180-4E2 180E1 180E1-11 (dedicated 2-, 3-port valves for manifold use) PR1 5(R) 1(P) 3(R) PR2 4(A) 2(B)</td>
</tr>
<tr>
<td><strong>181M □ □ AJ</strong>—AJ type (all ports, with quick fittings) manifold</td>
<td><strong>180M □ □ AJ</strong>—AJ type (all ports, with quick fittings) manifold</td>
</tr>
<tr>
<td>![181M □ □ AJ] A181E1 A181E1-11 PR 3(R) 1(P)</td>
<td>![180M □ □ AJ] 183-4E2, 183-4E2-13, 183-4E2-14 180-4E2 180E1 180E1-11 (dedicated 2-, 3-port valves for manifold use) PR1 5(R) 1(P) 3(R) PR2 4(A) (with quick fittings) 2(B) (with quick fittings)</td>
</tr>
</tbody>
</table>
### Basic Models and Valve Functions

<table>
<thead>
<tr>
<th>Item</th>
<th>181E1 (180E1\textsuperscript{Note})</th>
<th>180-4E1 (180-4E2)</th>
<th>180-4KE2\textsuperscript{Note}</th>
<th>183E2</th>
<th>183-4KE2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct piping,</td>
<td>A181E1 (A180E1\textsuperscript{Note})</td>
<td>A180-4E1 (A180-4E2)</td>
<td>A180-4KE2\textsuperscript{Note}</td>
<td>A183-4E2</td>
<td>A183-4KE2</td>
</tr>
<tr>
<td>F, FE type manifolds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-base piping,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A, AJ type manifolds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Number of positions

- 2 positions
- 3 positions
- 5 positions

#### Valve function

- Normally closed (NC, standard) or Normally open (NO, optional)
- Single solenoid, Double solenoid or Tandem solenoid
- Closed center (standard), Exhaust center (optional), Pressure center (optional) or Twin solenoid

#### Specifications

<table>
<thead>
<tr>
<th>Basic model</th>
<th>181E1 (180E1)</th>
<th>180-4E1 (180-4E2)</th>
<th>180-4KE2</th>
<th>183E2</th>
<th>183-4KE2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>Air</td>
<td>Internal pilot type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective area (Cv\textsuperscript{Note 1}) mm\textsuperscript{2}</td>
<td>10.2(0.57)</td>
<td>8.2(0.46)</td>
<td>9.0(0.50)</td>
<td>8.2(0.46)</td>
<td></td>
</tr>
<tr>
<td>Port size Note 2</td>
<td>Rc1/8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure range Mpa (kgf/cm\textsuperscript{2})</td>
<td>0.15<del>0.7 (1.5</del>7.1) [22~102]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof pressure Mpa (kgf/cm\textsuperscript{2}, psig)</td>
<td>1.05 (10.7) [152]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response time Note 3 ms</td>
<td>DC12V, DC24V 15/25 or below</td>
<td>15/25 (20) or below</td>
<td>20 or below</td>
<td>15/35 or below</td>
<td>15/40 or below</td>
</tr>
<tr>
<td>AC100V, AC200V 15/15 or below</td>
<td>15/15 or below</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum operating frequency Hz</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum time to energize for self holding ms</td>
<td>—</td>
<td>50</td>
<td>180-4E2</td>
<td>180-4E2</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range (atmosphere and media) °C [°F]</td>
<td>—</td>
<td>5<del>50 [41</del>122]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance m/s\textsuperscript{2} (G)</td>
<td>1373.0 [140.0] (Axial direction 294.2 [30.0])</td>
<td>294.2 [30.0]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting direction</td>
<td>Any</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Notes:

1. For details, see the effective area on p.336.
2. For details, see the port size on p.336.
3. Values when air pressure is 0.5MPa {5.1kgf/cm\textsuperscript{2} [73psi.]. Values in brackets ( ) for 180-4E2, 183-4KE2, and for A180-4ME2 are when switching from the opposite position, while the values for 183-4E2, 183-4KE2, and A183-4ME2 are those of the closed center valve, when switching from the neutral position.

### Solenoid Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>DC12V</th>
<th>DC24V</th>
<th>AC100V</th>
<th>AC200V</th>
<th>DC24V (Tandem solenoid)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>10.8~13.2 (12±10%)</td>
<td>21.6~26.4 (24±10%)</td>
<td>90~132 (100±10%)</td>
<td>180~264 (200±10%)</td>
<td>21.6~26.4 (24±10%)</td>
</tr>
<tr>
<td>Operating voltage range V</td>
<td>50</td>
<td>60</td>
<td>50</td>
<td>60</td>
<td>—</td>
</tr>
<tr>
<td>Current (when rated voltage is applied) mA [r.m.s]</td>
<td>130 (1.6W) [w/LED indicator]</td>
<td>65 (1.6W) [w/LED indicator]</td>
<td>24</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>Allowable leakage current mA</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Insulation resistance MΩ</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiring type and lead wire length</td>
<td>Standard</td>
<td>Grommet type: 300mm [11.8in.]</td>
<td>Plug connector type: 300mm [11.8in.]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional</td>
<td>Plug connector type: 300mm [11.8in.]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color of lead wire</td>
<td>Brown (+)</td>
<td>Red (+)</td>
<td>Yellow</td>
<td>White</td>
<td>Red (SA), Black (COM)</td>
</tr>
<tr>
<td>Color of LED indicator</td>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
<td>Red</td>
<td>Sur e absorption transistor</td>
</tr>
</tbody>
</table>

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### Effective Area \([\text{Cv}]\) \(\text{mm}^2\) \([\text{Cv}]\)

<table>
<thead>
<tr>
<th>Basic model</th>
<th>Standard (Single valve)</th>
<th>Built-in quick fittings</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>180E1</td>
<td>180E1</td>
<td>10.2 (0.57)</td>
<td>-</td>
</tr>
<tr>
<td>180E2</td>
<td>180E2</td>
<td>9.0 (0.50)</td>
<td>-4[J]: 4.4 (0.24)</td>
</tr>
<tr>
<td>183-4E2</td>
<td>183-4E2</td>
<td>8.2 (0.46)</td>
<td>-4[J]: 4.4 (0.24)</td>
</tr>
</tbody>
</table>

- When attaching TS6-01 to the 1(P), 4(A), 2(B) ports, the value is 9.2 (0.51).
- On the F type manifold, attaching TS4-01 to the 4(A), 2(B) ports gives the value 4.1 (0.23), and attaching TS6-01 gives the value 9.2 (0.51).
- When large flow rates are required, we recommend the 6 built-in quick fitting type.

#### Solenoid Valve Port Size

<table>
<thead>
<tr>
<th>Basic model</th>
<th>Port specification</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>181E1</td>
<td>Standard</td>
<td>Optional</td>
</tr>
<tr>
<td>180E1</td>
<td>Standard</td>
<td>Optional</td>
</tr>
<tr>
<td>180E2</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td>183-4E2</td>
<td>Optional</td>
<td></td>
</tr>
</tbody>
</table>

#### Manifold Connection Port Size

<table>
<thead>
<tr>
<th>Manifold model</th>
<th>Port</th>
<th>Location of piping ports</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>181M[注1]</td>
<td>1(P)</td>
<td>Manifold</td>
<td>Rct/1</td>
</tr>
<tr>
<td>180M[注1]</td>
<td>4(A), 2(B)</td>
<td>Valve</td>
<td>Rct/1/8</td>
</tr>
<tr>
<td>180M[注1]</td>
<td>3(R2), 5(R1)</td>
<td>Manifold</td>
<td>Rct/1</td>
</tr>
<tr>
<td>180M[注1]</td>
<td>3(R2), 5(R1)</td>
<td>Manifold</td>
<td>Rct/1</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>1(P)</td>
<td>PR</td>
<td>M5×0.8</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>4(A), 2(B)</td>
<td>PR</td>
<td>Rct/1</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>3(R2), 5(R1)</td>
<td>PR</td>
<td>Rct/1</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>1(P)</td>
<td>PR</td>
<td>M5×0.8</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>4(A), 2(B)</td>
<td>PR</td>
<td>Rct/1</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>3(R2), 5(R1)</td>
<td>PR</td>
<td>Rct/1</td>
</tr>
</tbody>
</table>

#### Solenoid Valve Mass \([g/\text{oz.}]\)

<table>
<thead>
<tr>
<th>Basic model</th>
<th>Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>181E1</td>
<td>95 [3.35]</td>
</tr>
<tr>
<td>180E1</td>
<td>105 [3.70]</td>
</tr>
<tr>
<td>180E2</td>
<td>105 [3.70]</td>
</tr>
<tr>
<td>180E2</td>
<td>155 [5.47]</td>
</tr>
<tr>
<td>183-4E2</td>
<td>190 [6.70]</td>
</tr>
<tr>
<td>183-4E2</td>
<td>240 [8.47]</td>
</tr>
<tr>
<td>181E1</td>
<td>105 [3.70]</td>
</tr>
<tr>
<td>180E1</td>
<td>115 [4.06]</td>
</tr>
<tr>
<td>180E2</td>
<td>165 [5.82]</td>
</tr>
<tr>
<td>180E2</td>
<td>260 [9.17]</td>
</tr>
<tr>
<td>180E2</td>
<td>213 [7.6]</td>
</tr>
<tr>
<td>180E2</td>
<td>200 [7.05]</td>
</tr>
<tr>
<td>180E2</td>
<td>245 [8.64]</td>
</tr>
</tbody>
</table>

- When attaching TS6-02 to the 1(P), 4(A), 2(B) ports on the sub-base gives the value 7.5 (0.42).

### Notes
1. The delivery port is the 2(A) for 180E1, A181E1.
2. When mounting a female thread specification, the ports are this size. For the built-in quick fitting types, quick fittings for the 6 port are not possible.

#### Manifold Mass \([g/\text{oz.}]\)

<table>
<thead>
<tr>
<th>Manifold model</th>
<th>Mass calculation of each unit (n=number of units)</th>
<th>Block-off plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>181M[注1]</td>
<td>(32×n)+30 [11.13×n]+1.06</td>
<td>14 [0.49]</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>(72×n)+72 [2.54×n]+2.54</td>
<td>22 [0.78]</td>
</tr>
<tr>
<td>181M[注1]</td>
<td>(80×n)+72 [2.54×n]+2.54</td>
<td>22 [0.78]</td>
</tr>
<tr>
<td>180M[注1]</td>
<td>(60×n)+70 [2.42×n]+2.47</td>
<td>19 [0.67]</td>
</tr>
<tr>
<td>180M[注1]</td>
<td>(120×n)+120 [4.87×n]+4.23</td>
<td>30 [1.06]</td>
</tr>
</tbody>
</table>

Remark: Figures in parentheses ( ) are the mass with sub-base:-25.
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 460 ℓ/ min [16.2ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].
**Solenoid valves**

- **3-position valve**
  - Closed center: Blank
  - Exhaust center: -13
  - Pressure center: -14

- **Sub-base**
  - Without sub-base: Blank
  - With sub-base: -25

- **Manual override**
  - Locking type: -81
  - Locking protruding type: -83
  - Locking manual lever type: -84

- **Wiring type**
  - Straight connector with LED indicator: -PSL
  - L connector with LED indicator: -PLL

- **5-port double solenoid**

- **5-port 3-position**

<table>
<thead>
<tr>
<th>Sub-base piping</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>180-4ME2</td>
<td>DC24V</td>
</tr>
<tr>
<td>183-4ME2</td>
<td></td>
</tr>
</tbody>
</table>

**Manifold**

- **3-position valve**
  - Closed center: Blank
  - Exhaust center: -13
  - Pressure center: -14

- **Manual override**
  - Locking type: -81
  - Locking protruding type: -83
  - Locking manual lever type: -84

- **Wiring type**
  - Straight connector with LED indicator: -PSL
  - L connector with LED indicator: -PLL

- **Manifold for combination mounting of 2-, 3-, 5-port valves**

<table>
<thead>
<tr>
<th>Manifold model/Number of units</th>
<th>Station</th>
<th>Basic model</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>180M</td>
<td>stn.</td>
<td>-A180-4ME2</td>
<td>-PSL</td>
</tr>
<tr>
<td>2</td>
<td>AJ</td>
<td>-A180-4ME2</td>
<td>-PLL</td>
</tr>
<tr>
<td>20</td>
<td>stn.</td>
<td>-A183-4ME2</td>
<td>-J4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-A183-4ME2</td>
<td>-J6</td>
</tr>
</tbody>
</table>

**Options**

- **Wiring type**
  - Straight connector with LED indicator: -PSL
  - L connector with LED indicator: -PLL

- **Manual override**
  - Locking type: -81
  - Locking protruding type: -83
  - Locking manual lever type: -84

- **AJ type manifold**
  - Quick fitting for 4 tube: -J4
  - Quick fitting for 6 tube: -J6

**Additional Parts (To be ordered separately)**

- Speed controller
- Muffler
- Block-off plate

**Made to Order**

- Lead wire length

*Note: They cannot be used as single units.*

*Always select one from each group.*

*Specify the valve model for each station.*

*Enter BP when closing a station with a block-off plate without mounting a valve.*

*Specify the tube size for each station.*

*They cannot be used as single units.*

*Specify the tube size for each station.*

*Specify the tube size for each station.*

---

**SOLENOID VALVES 180 SERIES**
### 180 Series Solenoid Valve, Air-piloted Valve Order Codes

#### 2-, 3-port Valve
- **Number of ports**: 3-port, 2-port
- **Valve function**: Normally closed (NC), Normally open (NO)
- **Valve function**: Exhaust center, Pressure center
- **Valve function**: Closed center, Normally closed (NC)

#### 3-port Valve
- **Valve function**: Normally closed (NC), Normally open (NO)
- **Valve function**: Exhaust center, Pressure center
- **Valve function**: Closed center, Normally closed (NC)

#### 5-port Valve
- **Valve function**: Normally closed (NC), Normally open (NO)
- **Valve function**: Exhaust center, Pressure center
- **Valve function**: Closed center, Normally closed (NC)

#### 3-position Valve
- **Valve function**: Normally closed (NC), Normally open (NO)
- **Valve function**: Exhaust center, Pressure center
- **Valve function**: Closed center, Normally closed (NC)

### Port fitting specifications
- **Note 2**: Lead wire length: 300mm [11.8in.] is standard.
- **Port fitting specifications**: Female thread: Blank
- **Port fitting specifications**: Male thread: Blank
- **Port fitting specifications**: Grommet type: Blank
- **Port fitting specifications**: Straight connector with LED indicator: Blank
- **Port fitting specifications**: L connector with LED indicator: Blank

### Manual override
- **Non-locking type**: Blank
- **Locking protruding type**: Blank

### Wiring type
- **Lead wire length**: 300mm [11.8in.] is standard.
- **Wiring type**: Blank

### Additional Parts (To be ordered separately)
- **Speed controller**: SCE-01, SCE-02
- **Muffler**: KM-10, KM-22
- **Mounting base**: 180-21
- **Block-off plate**: M-4P

### Notes:
1. They cannot be used as single units.
2. The port fittings are for \( \phi 4 \): TSK4-M8M, and for \( \phi 6 \): TSK6-M8M.

### 339
### 180 Series Manifold Order Codes

#### 2-3 port valve
- **Number of ports**
  - 2-port
  - 3-port

#### 2-3 port valve
- **Valve function**
  - Normally closed (NC)
  - Normally open (NO)

#### 3-position valve
- **Valve function**
  - Closed center
  - Exhaust center
  - Pressure center

#### Port fitting specifications
- Female thread: -J61, -J62: Quick fitting -J41, -J42: Quick fitting

#### Manual override
- Non-locking type
  - Locking
  - Non-locking type

#### Wiring type
- Lead wire length:
  - 300mm (11.8in.) is standard.
- Grommet type
- Locking protruding type

#### Made to Order
- The 180 series includes made to order items of various kinds for further system development.
- For details, see p.353—360.

#### Specification
- Lead wire length:
  - 300mm (11.8in.) is standard.
- Grommet type
- Locking protruding type

#### Made to Order
- The 180 series includes made to order items of various kinds for further system development.
- For details, see p.353—360.

#### Note 1
- Valve mounting location from the left-hand side when facing the (4(A), 2(B)) ports. Since a twin solenoid valve requires 2 stations per valve to mount, the second station (solenoid 12(S1) side) should be blank.
- Pre-wired common terminal for AC100V and AC200V is either -CP or -PLL.

#### Made to Order
- The 180 series includes made to order items of various kinds for further system development.
- For details, see p.353—360.

#### Specifications
- Valve function:
  - Normally closed (NC)
  - Normally open (NO)
- Pressure center:
  - Normally closed (NC)
  - Normally open (NO)

#### Voltage
- DC12V
- DC24V
- AC100V
- AC200V

#### Made to Order
- The 180 series includes made to order items of various kinds for further system development.
- For details, see p.353—360.
Dimensions of Solenoid Valve, 2-, 3-port (mm)

**181E1**

- **Manual override:**
  - Non-locking type: Standard
  - Locking protruding type: -83

- **Mounting hole:**
  - Approximately 300

- **Exhaust center:**
  - 14 (S2)
  - 4(A) 2(B)
  - 5(R1) 1(P) 3(R2)
  - 12(S1)

- **Pressure center:**
  - 14 (S2)
  - 4(A) 2(B)
  - 5(R1) 1(P) 3(R2)
  - 12(S1)

**A181E1-25**

- **Mounting base:**
  - 180-21

- **Muffler**
  - For direct piping: SCE-01
  - For sub-base mounting: SCE-02

**Additional Parts (To be ordered separately)**

- **Mounting base:** 180-21
- **Muffler:** 180-MUFF
- **Speed controller:** 180-SC

**183-4E2-13**

- **183-4KE2-13**
- **183-4E2-14**
- **183-4KE2-14**

(Both solenoids 13(S1) and 14(S2) are de-energized)

- **Mounting hole:**
  - To the top surface of the valve

**SOLENOID VALVES 180 SERIES**
Dimensions of Solenoid Valve 5-port, 2-, 3-position (mm)

180-4E1

Approximately 27 24

Manual override
Non-locking type: Standard
Locking protruding type:
2-M3 x 0.5
Mounting thread
(Viewed from A)

180-4E2

Approximately 27 24

Manual override
Non-locking type: Standard
Locking protruding type:
2-M3 x 0.5
Mounting thread
(Viewed from A)

183-4E2

Approximately 27 24

Manual override
Non-locking type: Standard
Locking protruding type:
2-M3 x 0.5
Mounting thread
(Viewed from A)
Additional Parts (To be ordered separately)

- Mounting base: 180-21
- Muffler: 180-MUFF
- Speed controller: 180-SC

Options

- With quick fittings (2-, 3-port):
  - J41 (For \( \Phi 4 \) tube, 2(A) or 4(A) port with fitting)
  - J42 (For \( \Phi 4 \) tube, 1(P), 2(A) ports with fittings)
  - J61 (For \( \Phi 6 \) tube, 2(A) or 4(A) port with fitting)
  - J62 (For \( \Phi 6 \) tube, 1(P), 2(A) ports with fittings)
  The drawing shows the -J62 specification.

- With quick fittings (5-port):
  - J42 (For \( \Phi 4 \) tube, 4(A), 2(B) ports with fittings)
  - J43 (For \( \Phi 4 \) tube, 1(P), 4(A), 2(B) ports with fittings)
  - J62 (For \( \Phi 6 \) tube, 4(A), 2(B) ports with fittings)
  - J63 (For \( \Phi 6 \) tube, 1(P), 4(A), 2(B) ports with fittings)
  The drawing shows the -J63 specification.

- Locking protruding type manual override: -83
- With quick fittings (2-, 3-port): -83
- With quick fittings (5-port): -J42, -J43, -J62, -J63

Made to Order

- Solenoid with straight connector: -PSL
- Solenoid with DIN connector: -39
- Solenoid with LED indicator: -L
- Built-in interface unit: -FA

Remark: Quick fittings are the following types:
- TSK4-M8M (for \( \Phi 4 \) tube), TSK6-M8M (for \( \Phi 6 \) tube)

<table>
<thead>
<tr>
<th>Model</th>
<th>Code</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>D'</th>
<th>( \ell ) (lead wire length)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>181E1, 181E1-25</td>
<td>94.6</td>
<td>87.6</td>
<td>102.7</td>
<td>89.1</td>
<td>89.3</td>
<td>-PSL, -PLL: 300</td>
<td>Overall length to the end of the valve or sub-base</td>
<td></td>
</tr>
<tr>
<td>180-4E1, 180-4KE2, A183-4KE2</td>
<td>104.6</td>
<td>97.6</td>
<td>112.7</td>
<td>99.1</td>
<td>99.3</td>
<td>Made to order: -1L: 1000, -3L: 3000</td>
<td>Overall length to the end of the opposite side solenoid</td>
<td></td>
</tr>
<tr>
<td>A180-4E1-25</td>
<td>110.7</td>
<td>103.7</td>
<td>118.8</td>
<td>105.2</td>
<td>105.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>180-4E2, A180-4E2-25</td>
<td>150.4</td>
<td>136.4</td>
<td>166.6</td>
<td>139.4</td>
<td>139.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>183-4E2, A183-4E2-25</td>
<td>166.2</td>
<td>152.2</td>
<td>182.4</td>
<td>155.2</td>
<td>155.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dimensions of Tandem Solenoid Valve, 5-port, 2-position (mm)

A180-4ME2-25-PSL

Options

- Locking protruding type: -83
- Locking manual lever type: -84
A183-4ME2-25-PSL

A183-4ME2-25-PLL

Options

- Locking protruding type: -83
- Locking manual lever type: -84
### Dimensions of Manifold for 2-, 3-port Valves (mm)

#### 181M-F

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>181M2F</td>
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</tr>
<tr>
<td>3F</td>
<td>76</td>
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<tr>
<td>4F</td>
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<tr>
<td>5F</td>
<td>114</td>
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<tr>
<td>6F</td>
<td>133</td>
<td>123</td>
</tr>
<tr>
<td>7F</td>
<td>152</td>
<td>142</td>
</tr>
<tr>
<td>8F</td>
<td>171</td>
<td>161</td>
</tr>
<tr>
<td>9F</td>
<td>190</td>
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<td>218</td>
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<tr>
<td>12F</td>
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<tr>
<td>13F</td>
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<td>14F</td>
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<td>370</td>
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<tr>
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</table>

#### 181M-A

**Unit dimensions**

<table>
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</tr>
</thead>
<tbody>
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</tr>
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<td>3A</td>
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<td>370</td>
</tr>
<tr>
<td>20A</td>
<td>399</td>
<td>389</td>
</tr>
</tbody>
</table>
### Options

- **With quick fitting (2-, 3-port):**
  - J41 (For 4 tube, 2(A) or 4(A) port with fitting)
  - J61 (For 6 tube, 2(A) or 4(A) port with fitting)

- **With quick fittings (5-port):**
  - J42 (For 4 tube, 4(A), 2(B) ports with fittings)
  - J62 (For 6 tube, 4(A), 2(B) ports with fittings)

- **Locking protruding type manual override:** -83

- **Solenoid with DIN connector:** -39

- **Solenoid with LED indicator:** -L

- **Built-in interface unit:** -FA

### Made to Order

- **Solenoid with straight connector:** -PSL

- **Solenoid with L connector:** -PLL

Remark: Quick fittings are the following types:

- TSK4-M8M (for 4 tube), TSK6-M8M (for 6 tube)

### Unit dimensions

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
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<td>370</td>
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<tr>
<td>20AJ</td>
<td>399</td>
<td>389</td>
</tr>
</tbody>
</table>

### Code Model

- A180E1, A180-4E1, A183-4E1
- A180-4E2, A180-4E2
- A183-4E2, A183-4E2

### Quick fitting

- J4: 4.8
- J6: 5.5

### Non-locking type

- Standard

### Locking protruding type

- Manual override: Approximately 300 mm

### Mounting hole

- With 2 plugs
- With 1 plug

### Block-off plate

- Made to order: -1L: 1000, -3L: 3000
Dimensions of Manifold for Combination Mounting of 2-, 3-, 5-port Valves (mm)

For options and made to order, see p.348.
For options and made to order, see p.348.
Dimensions of Manifold for Combination Mounting of Tandem Solenoid and 2-, 3-, 5-port Valves (mm)

**180M□A**

![Diagram of 180M□A manifold]

**180M□AJ**

![Diagram of 180M□AJ manifold]

**Unit dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
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<td>57</td>
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<td>180M2AJ</td>
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<td>370</td>
</tr>
<tr>
<td>20A</td>
<td>399</td>
<td>389</td>
</tr>
</tbody>
</table>

*Manual override: Approximately 300*
The 180 series Solenoid Valves include a variety of made to order solenoids for application in a wider range of control and wiring types.

**Plug connector**

- Straight connector with LED indicator
- L connector with LED indicator
  - Without lead wire
  - Connector and contacts included
- When ordering, enter -PSLN or -PLLN in place of the normal option code for the wiring type.

**DIN connector**

- A compact connector that is highly resistant to dust and water splashes.
- Employs a self-stripping method that eliminates the need for de-sheathing the lead wire.

  - When ordering, enter -39 in place of the normal option code for the wiring type.
  - A varistor for surge suppression is also equipped as standard. (For the AC100V and AC200V only. For DC12V and DC24V, a flywheel diode for surge suppression is installed as standard equipment.)
  - LED indicator is not available.

**Wiring instructions**

- **Solenoid with DIN connector**
  - When de-sheathing (only the outer sheath of the cable), pay attention to the lead wire direction. The cover will be easily mounted when the lead wire on the outer side of the terminal cover is set about 8mm [0.31in.] longer than the inner side. Without stripping off the sheath, insert the lead wire until it contacts the lead wire stopper on the terminal body, and then place the contact from the upper side. Then use pliers to press the lead wire further to ensure that the contact is firmly touching the core wire.

- **LED indicator**
  - The LED indicator for confirmation of operation is also available without a plug connector. This creates a clean monoblock look with a compact cover.

  - When ordering, enter -L in place of the normal option code for the wiring type.
  - A varistor for surge suppression is also equipped. (For the AC100V and AC200V only. For DC12V and DC24V, a flywheel diode for surge suppression is installed as standard equipment.)
Includes an interface unit with a photo transistor. Can be directly controlled by a microcomputer and logic chip, and is equipped with full electric noise countermeasures and LED indicators.

- When ordering, enter -FA in place of the normal option code for the wiring type.
- Cannot be ordered in combination with any other solenoid option.
- Rated voltages for the solenoid are AC100V and AC200V only.

### Block diagram

The interface unit is a triac with a photo coupler. Applying DC5V to the input terminals when AC power is applied on the solenoid side causes the LED inside the unit to light up, turns on the triac, and energizes the solenoid. At this time, an LED indicator turns on. When the input side voltage reaches 0V, the LED inside the unit shuts off, the triac is turned off, and the solenoid is de-energized. At this time, the LED indicator is turned off.

With a built-in zero-cross circuit, the zero-cross voltage is used to turn off the LED indicator. When the input side voltage is 0V, the LED inside the unit shuts off, the triac is turned off, and the solenoid is de-energized. At this time, an LED indicator turns on.

### Example of control circuits

1. **Control by transistor**

   ![Example of control circuits](image)

   **Example**
   
   \[ V_{P} = \frac{V_{m} - V_{n}}{2R1} \]

   In the case of \( V_{m} = 0 \) (V)

2. **Control by TTL, IC**

   ![Example of control circuits](image)

3. **Control by relay contact**

   ![Example of control circuits](image)

4. **When input is not a DC5V power supply**

   Install resistance externally to drop the input voltage to 4~6V.

   **Example**
   
   \[ R_{1} = \frac{V_{P} - V_{m}}{I_{G}} \]

<table>
<thead>
<tr>
<th>( R_{1} )</th>
<th>( R_{1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>390Ω</td>
</tr>
<tr>
<td>24</td>
<td>1.0kΩ</td>
</tr>
</tbody>
</table>

   The valve will not operate, however.

### Solenoid Specifications for Valve with Built-in Interface Unit

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage (DC) (V)</td>
<td>5</td>
</tr>
<tr>
<td>Voltage range (DC) (V)</td>
<td>4~6</td>
</tr>
<tr>
<td>Current (When 5V DC is applied) (mA)</td>
<td>18</td>
</tr>
<tr>
<td>Operating voltage (DC) (V)</td>
<td>4~10</td>
</tr>
<tr>
<td>Return voltage (DC) (V)</td>
<td>0.8~11</td>
</tr>
<tr>
<td>Color of lead wire</td>
<td>Red (+), Black (−)</td>
</tr>
</tbody>
</table>

### Wiring instructions

1. **Wiring type and lead wire length**

   Grommet type: 300mm [118in.]

2. **Example**

   ![Wiring instructions](image)

   **Example**
   
   \[ V_{m} < 6.0V (V_{m}:Peak voltage) \]
   \[ V_{n} > 4.0V (V_{n}:Lowest voltage) \]

3. **Voltage range**

   Over 100

4. **Voltage range**

   Min. AC1500V at input side and solenoid side

5. **Operating voltage range**

   AC100V: Yellow
   AC200V: White

6. **Rated voltage**

   AC100V: Yellow
   AC200V: White

7. **Insulation resistance**

   Over 100

8. **Electrically noise countermeasures and LED indicators.**

9. **Current (When 5V DC is applied)**

   18 mA

10. **Operating voltage range**

    AC100V: Yellow

11. **Voltage range**

    Over 100

12. **Rated voltage**

    AC200V: White

13. **Voltage range**

    Over 100

14. **Rated voltage**

    AC100V: Yellow

15. **Voltage range**

    Over 100

16. **Rated voltage**

    AC200V: White

17. **Voltage range**

    Over 100

18. **Rated voltage**

    AC100V: Yellow

19. **Voltage range**

    Over 100

20. **Rated voltage**

    AC200V: White

21. **Voltage range**

    Over 100

22. **Rated voltage**

    AC100V: Yellow

23. **Voltage range**

    Over 100

24. **Rated voltage**

    AC200V: White

25. **Voltage range**

    Over 100

26. **Rated voltage**

    AC100V: Yellow

27. **Voltage range**

    Over 100

28. **Rated voltage**

    AC200V: White

29. **Voltage range**

    Over 100

30. **Rated voltage**

    AC100V: Yellow

31. **Voltage range**

    Over 100

32. **Rated voltage**

    AC200V: White

33. **Voltage range**

    Over 100

34. **Rated voltage**

    AC100V: Yellow

35. **Voltage range**

    Over 100

36. **Rated voltage**

    AC200V: White

37. **Voltage range**

    Over 100

38. **Rated voltage**

    AC100V: Yellow

39. **Voltage range**

    Over 100

40. **Rated voltage**

    AC200V: White

41. **Voltage range**

    Over 100

42. **Rated voltage**

    AC100V: Yellow

43. **Voltage range**

    Over 100

44. **Rated voltage**

    AC200V: White

45. **Voltage range**

    Over 100

46. **Rated voltage**

    AC100V: Yellow

47. **Voltage range**

    Over 100

48. **Rated voltage**

    AC200V: White

49. **Voltage range**

    Over 100

50. **Rated voltage**

    AC100V: Yellow

51. **Voltage range**

    Over 100

52. **Rated voltage**

    AC200V: White

53. **Voltage range**

    Over 100

54. **Rated voltage**

    AC100V: Yellow

55. **Voltage range**

    Over 100

56. **Rated voltage**

    AC200V: White

57. **Voltage range**

    Over 100

58. **Rated voltage**

    AC100V: Yellow

59. **Voltage range**

    Over 100

60. **Rated voltage**

    AC200V: White

61. **Voltage range**

    Over 100

62. **Rated voltage**

    AC100V: Yellow

63. **Voltage range**

    Over 100

64. **Rated voltage**

    AC200V: White

65. **Voltage range**

    Over 100

66. **Rated voltage**

    AC100V: Yellow

67. **Voltage range**

    Over 100

68. **Rated voltage**

    AC200V: White

69. **Voltage range**

    Over 100

70. **Rated voltage**

    AC100V: Yellow

71. **Voltage range**

    Over 100

72. **Rated voltage**

    AC200V: White

73. **Voltage range**

    Over 100

74. **Rated voltage**

    AC100V: Yellow

75. **Voltage range**

    Over 100

76. **Rated voltage**

    AC200V: White

77. **Voltage range**

    Over 100

78. **Rated voltage**

    AC100V: Yellow

79. **Voltage range**

    Over 100
Sub-base regulator

Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>-52 (180MA-52) Note: -54 (180MA-54) Note</td>
</tr>
<tr>
<td>Media</td>
<td>Air</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>0.15 ~ 0.5 (1.5 ~ 5.1) [22 ~ 73]</td>
</tr>
<tr>
<td>Maximum operating pressure</td>
<td>0.7 [7.1] [102]</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.05 [10.7] [152]</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>5 ~ 50 [41 ~ 122]</td>
</tr>
<tr>
<td>Mass</td>
<td>80 [2.82]</td>
</tr>
</tbody>
</table>

Note: The order code in parentheses ( ) is for the sub-base regulator only.

Flow rate characteristics

<table>
<thead>
<tr>
<th>MPA</th>
<th>Primary pressure 0.7MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

Pressure characteristics

<table>
<thead>
<tr>
<th>MPA</th>
<th>Secondary pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>Setting point</td>
</tr>
<tr>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td></td>
</tr>
</tbody>
</table>

Order code

- When mounting on a manifold

Sub-base regulator

Station not mounting the sub-base regulator

Mounting valve model

- When mounting on a sub-base

Sub-base regulator

Value options

- For sub-base regulators to be ordered separately

180MA-52 1(P) port pressure regulating type (with a gasket and mounting screws)
180MA-54 2(B) port pressure regulating type (with a gasket and mounting screws)

Operating Principles and Symbols

P port pressure regulating type

B port pressure regulating type

Major Parts and Materials

<table>
<thead>
<tr>
<th>Parts</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Aluminum alloy (anodized)</td>
</tr>
<tr>
<td>Adjusting screw</td>
<td>Brass</td>
</tr>
<tr>
<td>Piston</td>
<td>Aluminum alloy (anodized)</td>
</tr>
<tr>
<td>Pressure regulating spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Seal</td>
<td>Synthetic rubber</td>
</tr>
</tbody>
</table>
### Handling Instructions and Precautions

**Application example**
- 1(P) port pressure regulating type: -52
  - Regulates the 4(A) and 2(B) port pressure to the same pressure

- 2(B) port pressure regulating type: -54
  - Regulates the 4(A) port pressure
  - When the 2(B) port pressure regulating type (order code: -54) is used to regulate the 4(A) port pressure, mount it so that the regulating screw is on the 3(R2) side of the manifold base.

- 2(B) port pressure regulating type: -54
  - Regulates the 2(B) port pressure

**Mounting**
1. Always thoroughly blow off (use compressed air) the tubing before piping. Entering metal chips, sealing tape, rust, etc., generated during piping work could result in air leaks or other defective operation.
2. Mount the sub-base regulator between the manifold base and the valve. In the standard configuration, the sub-base regulator’s pressure regulating screw is to be mounted on the manifold base’s 5(R1) port side. In the 2(B) port pressure regulating type, however, the pressure regulating screw can be mounted on the manifold base’s 3(R2) port side to regulate the 4(A) port pressure, as well. For mounting direction and function, see the application examples.

**Pressure regulation**
1. Check the pressure setting by connecting a pressure gauge. The pressure display sight glass will show the scale for the setting pressure as a guide.
2. Once the pressure is set, tighten the lock nut to lock in place.

---

**Dimensions (mm)**

180M □ A
180M □ AJ

A180E1-25
A180-4E □ -25
A183-4E2-25

1. **Viewed from A**

2. **Viewed from A**
### Air-piloted valves 180 series

- The optimum air valve for master valves or pilot valves for total pneumatic control.

### Made to Order

---

### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Basic mode</th>
<th>Port Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation type</td>
<td>Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of ports and positions</td>
<td>2 positions, 5 ports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective area [mm²]</td>
<td>10.2 (0.567)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>Main: Rc1/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pilot: Rc1/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning pressure range [Mpa]</td>
<td>0.15 [1.5]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning temperature range [°C]</td>
<td>0 [18]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stocking resistance [mol]</td>
<td>1373.0 [140.0]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting direction</td>
<td>Any</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation/piping [in.]</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass [g]</td>
<td>70 [2.47]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>80 [2.82]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90 [3.17]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>90 [3.17]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 [3.27]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. For details, see the effective area.
2. For details, see the port size.
3. Values in parentheses ( ) are the mass with sub-plate -25.

### Effective Area

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Basic model</th>
<th>For direct piping, F type manifold</th>
<th>For sub-base, A type, A1 type manifold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single valve</td>
<td>10.2 [0.57]</td>
<td>10.2 [0.57]</td>
<td>8.2 [0.46]</td>
</tr>
<tr>
<td>Built-in quick fitting for φ 4 tube</td>
<td>J42</td>
<td>4.4 [0.24]</td>
<td>4.4 [0.24]</td>
</tr>
<tr>
<td>Built-in quick fitting for φ 6 tube</td>
<td>J62</td>
<td>9.6 [0.53]</td>
<td>7.9 [0.44]</td>
</tr>
</tbody>
</table>

### Port Size

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Port</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female thread</td>
<td>1(P)</td>
<td>Rc1/8</td>
</tr>
<tr>
<td>Built-in quick fitting</td>
<td>J42</td>
<td>Rc1/8</td>
</tr>
<tr>
<td>Built-in quick fitting</td>
<td>J62</td>
<td>Rc1/8</td>
</tr>
<tr>
<td>Built-in quick fitting</td>
<td>J63</td>
<td>Rc1/8</td>
</tr>
</tbody>
</table>

---

### Manifold Specifications and Port Size

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Specifications</th>
<th>Port</th>
<th>Port Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>F type</td>
<td>1(P)</td>
<td>Rc1/4</td>
<td></td>
</tr>
<tr>
<td>A type</td>
<td>1(P)</td>
<td>Rc1/4</td>
<td></td>
</tr>
<tr>
<td>AJ type</td>
<td>1(P)</td>
<td>Rc1/4</td>
<td></td>
</tr>
</tbody>
</table>

### Manifold Mass

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Mass [g] [oz.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>F type</td>
<td>70 [2.47]</td>
</tr>
<tr>
<td>A type</td>
<td>80 [2.82]</td>
</tr>
<tr>
<td>AJ type</td>
<td>90 [3.17]</td>
</tr>
</tbody>
</table>

### Minimum Pilot Pressure

<table>
<thead>
<tr>
<th>Model</th>
<th>Pilot Pressure [Mpa] [psi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>180-4A</td>
<td>2 [6.6]</td>
</tr>
<tr>
<td>180-4A2</td>
<td>2 [6.6]</td>
</tr>
</tbody>
</table>

### Time Required for Switching

<table>
<thead>
<tr>
<th>Model</th>
<th>Time Required [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>180-4A</td>
<td>0.07</td>
</tr>
<tr>
<td>180-4A2</td>
<td>0.09</td>
</tr>
</tbody>
</table>

---

### Diagrams

- [Diagram of Air-piloted valves 180 series]

---

357
Cylinder Operating Speed and Flow Rate

**180-4A**
- Measurement conditions:
  - Air pressure: 0.5 MPa (5.1 kg/cm²) (73 psi)
  - Piping inner diameter and length: 6 [0.24 in.] x 1000 mm [39 in.]
  - Fitting: Quick fitting TS8-01
  - Load ratio: Cylinder theoretical thrust (%)
  - Cylinder stroke: 150 mm [5.91 in.]

![Air-piloted valve 180-4A](image)

Maximum operating speed

![Graph](image)

Flow rate: 180 series

**A180-4A-25**
- Measurement conditions:
  - Air pressure: 0.5 MPa (5.1 kg/cm²) (73 psi)
  - Piping inner diameter and length: 6 [0.24 in.] x 1000 mm [39 in.]
  - Fitting: Quick fitting TS8-02
  - Load ratio: Cylinder theoretical thrust (%)
  - Cylinder stroke: 150 mm [5.91 in.]

![Air-piloted valve 180-4A-25](image)

Maximum operating speed

![Graph](image)

**Operating, Principles, and Major Parts and Materials**

**5-port, 2-position**

5-port, 2-position

- Pilot connection port
- Piston
- Stem
- Body
- 14 (PA)
- 1 (P)
- 2 (B)
- 3 (R2)
- 4 (A)
- 5 (R1)

**180-4A**

Normal state

Operating state

(Condition with pilot air applied to 12 [PB], and then released)

1mm/s = 0.0394 in./sec.

**Major Parts and Materials**

<table>
<thead>
<tr>
<th>Parts</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Aluminum alloy (anodized)</td>
</tr>
<tr>
<td>Stem</td>
<td>Synthetic rubber</td>
</tr>
<tr>
<td>Lip seal</td>
<td>Synthetic rubber</td>
</tr>
<tr>
<td>Mounting base</td>
<td>Mild steel (zinc plated)</td>
</tr>
<tr>
<td>Sub-base</td>
<td>Aluminum alloy (anodized)</td>
</tr>
</tbody>
</table>
Dimensions of Air-piloted 5-port, 2-position Valve (mm)

180-4A

Options

- Mounting base: -21
- With quick fittings: -J42 (For 4 tube, 4(A), 2(B) ports with fittings)
  -J43 (For 4 tube, 1(P), 4(A), 2(B) ports with fittings)
  -J62 (For 6 tube, 4(A), 2(B) ports with fittings)
  -J63 (For 6 tube, 1(P), 4(A), 2(B) ports with fittings)

- Speed controller: -70

- Muffler: -75
Dimensions of Air-piloted 5-port, 2-position Valve (mm)

**Options**

- **Sub-base:** -25
  
  - Width across flats: 16.2
  
  - Mounting hole size: 14
  
  - 2-M5×0.8
  
  - 5-Rc 1/4
  
  - 2-M5×0.8
  
- **Speed controller:** -70
  (for sub-base only)
  
  - Width across flats: 14
  
  - R1/4

**A180-4A**

- Rc 1/4
- Speed controller:
- Sub-base:

**A180-4A2**

- 2-Rc 1/4
- Pilot connection port
- Sub-base:
- Speed controller:
Handling Instructions and Precautions

Internal circuit

**DC12V, DC24V**

- Standard solenoid (Surge suppression)
  - Short circuit protection diode
  - Lead wire: DC12V: Brown
  - DC24V: Red
  - Pyrehead diode
  - Lead wire: Black
  - Lead wire: DC12V: Black

- Solenoid with LED indicator (Surge suppression)
  - Order code: -PSL, -PLL

**AC100V, AC200V**

- Standard solenoid (Surge suppression)
  - Lead wire: AC100V: Yellow
  - AC200V: White

- Solenoid with LED indicator (Surge suppression)
  - Order code: -PSL, -PLL

**DC24V**

- Tandem solenoid

<table>
<thead>
<tr>
<th>A</th>
<th>COM</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLA</td>
<td>B</td>
</tr>
<tr>
<td>SOLB</td>
<td></td>
</tr>
</tbody>
</table>

**Cautions:**
1. Do not apply megger between the lead wires.
2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the valve will not operate.
3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or in other erratic operation. Always use it within the range of the allowable leakage current. If circuit conditions, etc. cause the leakage current to exceed the allowable leakage current, consult us.
4. For double solenoid and twin solenoid, avoid energizing both solenoids simultaneously. The valve could fall into the neutral position.

**Plug connector**

**Attaching and removing plug connector**

Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section of the connector housing, and complete the connection.

**Cautions:**
1. Do not pull hard on the lead wire. It could result in defective contacts, breaking wires, etc.
2. If the pin is bent, use a small screwdriver, etc. to gently straighten out the pin, and then complete the connection to the plug connector.

**Common terminal pre-wired plug connector**

1. **Pre-wired common terminal at DC positive side or AC positive common**
   - Order code: With straight connector:
     - -CPSL
     - With L connector: -CPLL
   - Crossover wire
   - Connector
   - Color of COM, crossover wire: DC12V: Brown
     - DC24V: Red
     - AC100V: Yellow
     - AC200V: White

2. **Pre-wired common terminal at DC negative side**
   - Order code: With straight connector:
     - -CMSL
     - With L connector: -CMALL
   - Crossover wire
   - Connector
   - Color of COM, crossover wire: DC12V: Black
     - DC24V: Black

**Cautions:**
1. The diagrams show the straight connector configuration. While the connector's orientation is different in the case of the L connector, in every case the first COM lead wire comes from the last station's mounted valve.
2. Since the COM terminal is connected to a crossover terminal inside the connector housing, the connector cannot be switched between a positive common and a negative common by changing the connectors.

**Crimping of connecting lead wire and contact**

To crimp lead wires into contacts, strip off 4mm [0.16in.] of the insulation from the end of the lead wire, insert it into the contact, and crimp it. Be sure to avoid catching the insulation on the exposed wire crimping section.

**Cautions:**
1. Do not pull hard on the lead wire.
2. Always use a dedicated tool for crimping of connecting lead wire and contact.

- Contact: Model 702062-2M
- Manufactured by Sumiko Tech, Inc.
- Crimping tool: Model F-702062
- Manufactured by Sumiko Tech, Inc.
To operate the manual override, press it all the way down. The single solenoid valve works the same as when in the energized state as long as the manual override is pushed down, and returns to the normal position upon release.

For the double solenoid and twin solenoid valves, pressing the manual override on the 12(S1) side switches the 12(S1) to enter the energized position, and the unit remains in that state even if the manual override is released. To return it to the normal position, operate the manual override on the 14(S2) side. This is the same for the solenoid 14(S2).

Illustration shows the 110 series.

To lock the locking type manual override, use a small screwdriver to push down the manual override all the way, then set the 0 position as the reference point and turn it in the clockwise direction as far as position A. This achieves the same conditions as when the 14(SA) side is energized, and the manual override is locked in place. For the 12(SB) side, turn it in the counterclockwise direction as far as position B. To release the lock, return the manual override to the 0 position. A spring mechanism returns the manual override to its normal position, and the lock is released. Care should be taken to avoid excessive turning of the manual override, which could damage it.

Illustration shows the 110 series.

Cautions: 1. The 180 series valves are internal pilot type solenoid valves. As a result, the manual override cannot switch the main valve without air supplied from the 1(P) port.
2. Always release the lock of the locking protruding type manual override before commencing normal operation.
3. Do not attempt to operate the manual override with a pin or other object having an extremely fine tip. It could damage the manual override button.
4. Do not turn the adjusting knob more than needed. It could result in defective operation.

When installing a mounting base to the valve, always use the provided screws. The recommended tightening torque for the screws is 49N·cm (5kgf·cm) [4.3in·lbf]. If you must use screws other than the provided ones, use screws with a screw length of 6mm [0.24in.] or less. Avoid applying excessive force or shocks.

When mounting valves on manifold, apply the recommended tightening torque of 49N·cm (5kgf·cm) [4.3in·lbf] for the valve mounting screws.