Clean Regulator

**SRH Series**

Contamination controlled stainless steel regulator
Clean Regulator

SRH Series

Outstanding corrosion resistance
All metal parts in contact with fluid use stainless steel 316

Oil free
Parts assembled without any use of oils

Consistent clean room production
Washed, assembled and inspected in a Class 100 environment, and sealed in double bags

2 types of diaphragm material available
Depending upon the application, PTFE (Grade A) or fluororubber (Grade B) can be selected for the diaphragm material

Designed to minimize residual fluid
- Design includes an intake/exhaust port in the diaphragm compartment which facilitates flow
- Valve springs are partitioned by the diaphragm

Pulsation suppressing design

Step response comparison

Circuit diagram

Current regulator

Manufacturing process

Grade A
- Parts assembly
  - Degrease/Wash
  - Pure water (16MΩ-cm) wash
  - Assembly
  - Inspection
  - Interior purge
  - Package

Grade B
- Parts assembly
  - Degrease/Wash
  - Assembly
  - Inspection
  - Interior purge
  - Package

Clean booth Class 100
Clean Regulator

SRH Series

How to Order

SRH 3 0 0 0 - 02

Body size
3 1/4
4 3/8

Washing grade
0 Grade A
1 Grade B

Set pressure
0 0.02 to 0.2 MPa
1 0.05 to 0.7 MPa

Relief mechanism
0 Non-relief
1 Relief

Made to Order
Refer to pages 864 to 866 for details.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>SRH3000</th>
<th>SRH4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relief mechanism</td>
<td>Non-relief</td>
<td>Relief</td>
</tr>
<tr>
<td>Port size</td>
<td>Rc 1/8, 1/4</td>
<td>Rc 1/4, 3/8, 1/2</td>
</tr>
<tr>
<td>Fluid</td>
<td>Grade A</td>
<td>Grade B</td>
</tr>
<tr>
<td>Fluid-contact material (metal)</td>
<td>Stainless steel 316 (Body is stainless steel 316L)</td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.5 MPa</td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>1 MPa</td>
<td></td>
</tr>
<tr>
<td>Set pressure Low pressure type</td>
<td>0.02 to 0.2 MPa</td>
<td></td>
</tr>
<tr>
<td>High pressure type</td>
<td>0.05 to 0.7 MPa</td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperatures</td>
<td>0 to 60°C (No freezing)</td>
<td></td>
</tr>
<tr>
<td>Diaphragm material</td>
<td>Grade A</td>
<td>Grade B</td>
</tr>
<tr>
<td>Diaphragm material</td>
<td>PTFE</td>
<td>Fluororubber</td>
</tr>
<tr>
<td>Weight</td>
<td>360 g</td>
<td>730 g</td>
</tr>
</tbody>
</table>

Note) The pressure gauge is optional. Refer to option specifications on page 862.
Note that the products used for the port size A2 or A3 are not available at SMC.
SRH Series

Flow Rate Characteristics (Representative Value)

**Fluid: Air**

**Conditions/Inlet pressure: 0.5 MPa**

- SRH3000-02
- SRH3100-02
- SRH4000-03
- SRH4100-03

**Conditions/Inlet pressure: 0.7 MPa**

- SRH3010-02
- SRH3110-02
- SRH4010-03

**Fluid: Water**

**Conditions/Inlet pressure: 0.5 MPa**

- SRH3000-02
- SRH3100-02
- SRH4000-03
- SRH4110-03 SRH4100-03

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Clean Regulator
SRH Series

**Pressure Characteristics** (Representative Value)

**Fluid: Water/Air**

**Conditions/ Inlet pressure: 0.7 MPa, Outlet pressure: 0.2 MPa, Flow rate 2 L/min**

- **SRH3010-02**
- **SRH3000**
- **SRH3110-02**
- **SRH3100**
- **SRH4010-03**
- **SRH4000**
- **SRH4110-03**
- **SRH4100**
## Construction

### Component parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material A</th>
<th>Material B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Stainless steel 316L</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Diaphragm</td>
<td>PTFE</td>
<td>Fluororubber</td>
</tr>
<tr>
<td>3</td>
<td>Diaphragm</td>
<td>PTFE</td>
<td>Fluororubber</td>
</tr>
<tr>
<td>4</td>
<td>Valve guide</td>
<td>PPS</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bonnet</td>
<td>PPS</td>
<td></td>
</tr>
</tbody>
</table>
Clean Regulator SRH Series

**Dimensions**

**Rc thread type**

Panel thickness Max. 3

Panel mounting holes

**Metal gasket seal fitting type**

Dimensions inside ( ) are for SRH4000.

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Gauge port (standard specifications)
SRH Series

Options

Pressure Gauge

Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Operating temperature range</th>
<th>Accuracy</th>
<th>Scale range</th>
<th>Parts washing (fluid-contact parts)</th>
<th>Assembly and adjustment environment</th>
<th>Materials</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>G46-2-02-SRA</td>
<td>R 1/4</td>
<td>0 to 60°C (No freezing)</td>
<td>± 3% F.S.</td>
<td>270°</td>
<td>Precision wash</td>
<td>Clean room</td>
<td>Stainless steel 316</td>
<td>80 g</td>
</tr>
<tr>
<td>G46-2-02-SRB</td>
<td>R 1/4</td>
<td>0 to 60°C (No freezing)</td>
<td>± 3% F.S.</td>
<td>270°</td>
<td>General degrease</td>
<td>General production line</td>
<td>Stainless steel 304 (Black melamine coating)</td>
<td></td>
</tr>
</tbody>
</table>

Specifications

Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure range</th>
<th>Indicator units</th>
</tr>
</thead>
<tbody>
<tr>
<td>G46-2-02-SRA</td>
<td>0 to 0.2</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-2-02-SRB</td>
<td>0 to 0.4</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-4-02-SRA</td>
<td>0 to 0.7</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-4-02-SRB</td>
<td>0 to 1.0</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-7-02-SRA</td>
<td>0 to 1.0</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-7-02-SRB</td>
<td>0 to 1.0</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-10-02-SRA</td>
<td>0 to 1.0</td>
<td>MPa</td>
</tr>
<tr>
<td>G46-10-02-SRB</td>
<td>0 to 1.0</td>
<td>MPa</td>
</tr>
</tbody>
</table>

Note) Consult SMC for the supply of types with metal gasket seal.

Procedure for setting the limit gauge indicator

1) Before setting the limit indicator, turn the cover counterclockwise (approximately 6 to 7 mm) until it stops. Then, remove by pulling it towards you.

2) Use a flat head screwdriver (with a 2.9 mm blade width) to set the limit indicator. Be careful not to bend other needle or damage the dial plate.

3) After completing the setting, replace the cover. Fit the cover by aligning the cutout in the cover to the groove on the top of the black case. Turn the cover clockwise (approximately 6 to 7 mm) and make sure that the matching mark on the cover is aligned with the groove on the top of the case.

Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 387 to 391 for Precautions on every series.

Caution

1) Avoid use in locations with strong pressure pulsation or vibration.

2) Contact SMC if the product is to be used in an application with a high frequency of operation.

Mounting

Caution

1) Do not subject the gauge to shocks, such as dropping during transportation and mounting, as this can cause loss of indication accuracy.

2) Do not use this gauge in a location with high temperature and humidity, as this may cause faulty operation.

3) When mounting the pressure gauge, be certain to use a wrench on the square wrench flats to screw it into place. If the wrench is applied on any other part, air leakage or other damage may occur.
### Brackets

<table>
<thead>
<tr>
<th></th>
<th>For SRH3000</th>
<th>For SRH4000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>B21-1-T1</td>
<td>1350112-T1</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Rolled sheet steel (Electroless nickel plated)</td>
<td></td>
</tr>
</tbody>
</table>

#### Dimensions

- **For SRH3000**
  - Brackets: 30, 50, 6.5, 28, 41
  - Ø31
  - 8.5
  - 6.5
  - 30
  - 51
  - 20
  - 28

- **For SRH4000**
  - Brackets: 20, 28, 1.6, 13.5, 21
  - Ø37
  - 10
  - 36
  - 61
  - 8
  - 36
  - 13.5
  - 21
### SRH Series
**Made to Order Specifications 1**

Please contact SMC for detailed dimensions, specifications and lead times.

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#### 1. EPDM Seals

Regulator with seals made of a different material.

<table>
<thead>
<tr>
<th>SRH</th>
<th>Standard model no.</th>
<th>— X210</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EPDM seals</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Relief mechanism</th>
<th>Model</th>
<th>Port size</th>
<th>Fluid</th>
<th>Proof pressure</th>
<th>Max. operating pressure</th>
<th>Set pressure Low pressure type</th>
<th>Set pressure High pressure type</th>
<th>Ambient and fluid temperatures</th>
<th>Fluid-contact material (metal)</th>
<th>Diaphragm material</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-relief</td>
<td>X210</td>
<td>Rc 1/8, 1/4</td>
<td>Clean air, N₂, Ar, CO₂, Pure water</td>
<td>1.5 MPa</td>
<td>1.0 MPa</td>
<td>0.02 to 0.2 MPa</td>
<td>0.05 to 0.7 MPa</td>
<td>0 to 60°C (No freezing)</td>
<td>Stainless steel 316 (Body is stainless steel 316L)</td>
<td>Grade A</td>
<td>360 g</td>
</tr>
<tr>
<td>Relief</td>
<td>X211</td>
<td>Rc 1/8, 1/4</td>
<td>Clean air, Ar, N₂, Ar, CO₂, Water</td>
<td>1.5 MPa</td>
<td>1.0 MPa</td>
<td>0.02 to 0.2 MPa</td>
<td>0.05 to 0.7 MPa</td>
<td>0 to 60°C (No freezing)</td>
<td>Fluororubber</td>
<td>Grade B</td>
<td>730 g</td>
</tr>
</tbody>
</table>

**Made to Order**

Nil

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#### 2. With Relief Port Fittings (Applicable tube O.D.: ø4)

Regulator with a fitting in order to connect it to the relief port.

<table>
<thead>
<tr>
<th>SRH</th>
<th>Standard model no.</th>
<th>— X211</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EPDM seals</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Relief mechanism</th>
<th>Model</th>
<th>Port size</th>
<th>Fluid</th>
<th>Proof pressure</th>
<th>Max. operating pressure</th>
<th>Set pressure Low pressure type</th>
<th>Set pressure High pressure type</th>
<th>Ambient and fluid temperatures</th>
<th>Fluid-contact material (metal)</th>
<th>Diaphragm material</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-relief</td>
<td>X210</td>
<td>Rc 1/8, 1/4</td>
<td>Clean air, N₂, Ar, CO₂, Pure water</td>
<td>1.5 MPa</td>
<td>1.0 MPa</td>
<td>0.02 to 0.2 MPa</td>
<td>0.05 to 0.7 MPa</td>
<td>0 to 60°C (No freezing)</td>
<td>Stainless steel 316 (Body is stainless steel 316L)</td>
<td>Grade A</td>
<td>360 g</td>
</tr>
<tr>
<td>Relief</td>
<td>X211</td>
<td>Rc 1/8, 1/4</td>
<td>Clean air, Ar, N₂, Ar, CO₂, Water</td>
<td>1.5 MPa</td>
<td>1.0 MPa</td>
<td>0.02 to 0.2 MPa</td>
<td>0.05 to 0.7 MPa</td>
<td>0 to 60°C (No freezing)</td>
<td>Fluororubber</td>
<td>Grade B</td>
<td>730 g</td>
</tr>
</tbody>
</table>

**Dimensions**

Dimensions other than below are the same as the standard type.

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![Applicable tube O.D.: ø4
Fitting: KQH04-M5-X17](image_url)
Fluoro grease is applied to an adjusting screw in order to make the knob operation easy.

Oil is not used for the wetted parts.

The body material has been changed to aluminum.

The body material has been changed to aluminum.
SRH Series
Made to Order Specifications 3
Please contact SMC for detailed dimensions, specifications and lead times.

6 Regulator (Stainless Steel 316) with Port Sizes Rc 3/4, Rc 1

• Regulator made of stainless steel 316 with port sizes Rc 3/4 and Rc 1.
• EPDM or FPM is used for valves (seals), O-rings and diaphragms.
• Oil-free
Oil is not used for any of the parts and all wetted parts are degreased.
Note) Products must be assembled under normal conditions.

Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size</td>
<td>Rc3/4</td>
<td>Rc1</td>
<td>Rc3/4</td>
<td>Rc1</td>
<td>Rc3/4</td>
<td>Rc1</td>
<td>Rc3/4</td>
<td>Rc1</td>
</tr>
<tr>
<td>Relief mechanism</td>
<td>Non-relief</td>
<td>Relief</td>
<td>Non-relief</td>
<td>Relief</td>
<td>Non-relief</td>
<td>Non-relief</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid</td>
<td>Deionized water (Pure water)</td>
<td>Air, N2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.5 MPa</td>
<td>1.9 MPa</td>
<td>1.0 MPa</td>
<td>1.3 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>1.0 MPa</td>
<td>1.3 MPa</td>
<td>1.0 MPa</td>
<td>1.3 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set pressure</td>
<td>0.05 to 0.5 MPa</td>
<td>0.1 to 1.0 MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperatures</td>
<td>5 to 60°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluid-contact material (metal)</td>
<td>Stainless steel 316</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaphragm material</td>
<td>EPDM</td>
<td>Fluororubber</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) The pressure gauge is optional. For details, refer to the Options on page 862.

Flow Rate Characteristics

- Max. operating flow rate (negative) range.

Conditions/Inlet pressure: 0.5 MPa, Fluid: Water

Conditions/Inlet pressure: 0.55 MPa, Fluid: Air

Component parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Stainless steel 316</td>
</tr>
<tr>
<td>2</td>
<td>Bonnet</td>
<td>ADC12</td>
</tr>
<tr>
<td>3</td>
<td>Valve guide</td>
<td>Stainless steel 316</td>
</tr>
<tr>
<td>4</td>
<td>Diaphragm Assembly</td>
<td>EPDM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stainless steel 316 (Wetted part metal)</td>
</tr>
<tr>
<td>5</td>
<td>Valve</td>
<td>EPDM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stainless steel 316 (Wetted part metal)</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>EPDM</td>
</tr>
</tbody>
</table>
### Design and Selection

⚠️ **Warning**

1. **Confirm the fluid.**

   Because the fluid to be used differs depending on the product, be certain to confirm the specifications. If an incompatible fluid is used, special characteristics will change and this may cause improper operation.

2. **Residual pressure relief is not possible without inlet pressure.**

   In the SRH series, if the inlet pressure is cut off while pressure still remains on the outlet side, it is not possible to eliminate the outlet pressure (residual pressure relief). If it will be necessary to eliminate pressure from the outlet side, a circuit should be provided for residual pressure relief.

⚠️ **Caution**

1. **Oscillation (beat) may occur with some operating conditions even if the operation is within specification. Contact SMC for that case.**

### Pressure Adjustment

⚠️ **Warning**

1. **Do not use tools when operating the pressure regulator knob.**

   If tools etc. are used to operate the pressure regulator knob, damage may occur. Operate this knob only by hand.

⚠️ **Caution**

1. **Perform pressure adjustments only after releasing the lock.**

   When the pressure regulator knob will not turn, it is locked. Release the lock by pulling the pressure regulator knob out. If the knob is turned by force damage will occur. Lock again after adjusting the pressure by pressing the knob back down.

2. **Adjust pressure in an upward direction.**

   A correct pressure setting cannot be achieved by adjusting the pressure downward. The outlet pressure is increased by turning the pressure regulator knob to the right, and decreased by turning the knob to the left.

3. **In the case of the non-relief type, the pressure cannot be reduced by turning the pressure regulator knob to the left.**

   In the case of the non-relief type regulator, the outlet pressure will not decrease even if the knob is turned to the left, when there is no outlet fluid consumption. The knob will be damaged if it is turned by force.

   In case the pressure setting is too high, reduce the pressure on the outlet side to less than the desired setting pressure by consuming fluid on the outlet side, and then reset to the desired pressure.

4. **Confirm the inlet pressure.**

   Set the outlet pressure to no more than 85% of the inlet pressure. If the inlet pressure is too low, a correct setting pressure cannot be attained.

5. **Do not use fluid containing solid matter.**

   This will cause faulty operation.

### Mounting

⚠️ **Caution**

1. **Open the sealed package inside a clean room.**

   These products are packaged in sealed double packaging in a clean room. It is recommended that the inside packaging be opened in a clean room or other clean environment.

2. **Flush out the piping.**

   Connect these products to piping only after it has been flushed and cleaned properly. If debris or scale etc. remains in the piping, this can cause faulty operation or failure.

3. **Be certain that sealing material does not get inside the piping.**

   When screwing in pipes and joints etc., take care that cutting dust from the pipe threads, sealing material, and the like do not get inside the piping. If debris or scale etc. remain inside the piping, this may cause faulty operation or failure. Also, when thread tape is used, leave 1.5 to 2 threads exposed at the end of the pipe.

4. **Confirm the mounted orientation of the product.**

   The side marked IN is the fluid inlet port, and the side marked OUT is the fluid exhaust port. If mounted backwards, the device will not operate properly.