Electrode Holder
BF-□(R)/BS-1(T)

Complete Lineup for Use in High-temperature, High-pressure Environments or Where Exposed to Chemicals

• The BF-1 is ideal for liquids with low specific resistance, such as wastewater.
• The BF-□(R) is used when a strong mounting is required.
• The BS-1 is used when high-temperature, high-pressure resistant is required.
• The BS-1T is used when corrosion resistance is required.

Refer to Safety Precautions for Electrodes and Electrode Holders.

Ordering Information

Electrode Holders

<table>
<thead>
<tr>
<th>Application</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid with low specific resistance For 1-pole electrode</td>
<td>BF-1</td>
</tr>
<tr>
<td>When sturdy mounting is required For 3-pole electrode For 3-pole electrode (2-wire)</td>
<td>BF-3</td>
</tr>
<tr>
<td>For 5-pole electrode For 5-pole electrode (2-wire)</td>
<td>BF-5</td>
</tr>
<tr>
<td>Applications where resistance to high-temperature, high-pressure is required For 1-pole electrodes, 250°C, 1.96 MPa</td>
<td>BS-1 BS-1S BS-1S1 BS-1S2</td>
</tr>
<tr>
<td>High-pressure application where resistance to corrosion is required For 1-pole electrode, SUS304 981 kPa For 1-pole electrode, SUS316 981 kPa For 1-pole electrode, Titanium 981 kPa For 1-pole electrode, Hastelloy B 981 kPa For 1-pole electrode, Hastelloy C 981 kPa</td>
<td>BS-1T SUS304 BS-1T SUS316 BS-1T TITANIUM BS-1T HAS B BS-1T HAS C</td>
</tr>
</tbody>
</table>

Accessories (Order Separately)

<table>
<thead>
<tr>
<th>Application</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective Cover (For PS-□S and BF-3/-4/-5)</td>
<td>F03-11</td>
</tr>
<tr>
<td>Protective Cover (For BF-□-1 and BS-□-1S)</td>
<td>F03-19</td>
</tr>
<tr>
<td>M18 Nut (For BS-1)</td>
<td>F03-17</td>
</tr>
<tr>
<td>M18 Nut (For BS-1T)</td>
<td>F03-18</td>
</tr>
</tbody>
</table>

Note: Refer to Installing an Electrode Holder on a Tank under Level Controller Installation in the Technical Guide for Level Controllers for information on Level Controller installation. Refer to PS-□S(R) Electrode Holder Accessories (Order Separately) for dimensions.

Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>BF-1</th>
<th>BF-3 (R) (See note 1.)</th>
<th>BF-5 (R) (See note 1.)</th>
<th>BS-1</th>
<th>BS-1T</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Electrodes</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Insulator material</td>
<td>PPS resin (Metallic section is SUS.)</td>
<td>Fluorocarbon polymer (PFA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>100 MΩ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature Electrode section: −10 to 150°C (with no icing) Terminal section: −10 to 70°C (with no icing or condensation)</td>
<td>250°C max.</td>
<td>180°C max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure Atmospheric pressure</td>
<td>1.96 MPa (See note 2.)</td>
<td>981 kPa (See note 2.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applications Liquid with low specific resistance, such as wastewater and cloudy water</td>
<td>General applications for purified water and wastewater</td>
<td>Boiler water level detection or high-temperature tanks</td>
<td>Acid or alkaline solution level detection</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: 1. Two-wire Electrode Holders (R models) have a built-in resistance of 6.8 kΩ. They should be used with the Two-wire 61F Controllers.
2. There must be a sufficient ambient temperature in a high-pressure environment to prevent vapor leakage. Use the Electrode Holder according to the following pressure-temperature curve.
■ Appearance

Note: 1. The F03-11 Protective Cover (sold separately) is available.
2. Clamp screws are not provided for hastelloy B, hastelloy C, or titanium Electrode Holders. When placing an order, specify the type of material from the following five: SUS304, SUS316, Hastelloy B, Hastelloy C, or Titanium.

<table>
<thead>
<tr>
<th>Model</th>
<th>Material at tightening section</th>
<th>Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS-1</td>
<td>Iron</td>
<td>M18 P = 1.5</td>
</tr>
<tr>
<td>BS-1S</td>
<td>SUS304</td>
<td>M18 P = 1.5</td>
</tr>
<tr>
<td>BS-1S1</td>
<td>SUS304</td>
<td>PT1/2</td>
</tr>
<tr>
<td>BS-1S2</td>
<td>SUS316</td>
<td>M18 P = 1.5</td>
</tr>
</tbody>
</table>

3. Clamp screws are not provided for hastelloy B, hastelloy C, or titanium Electrode Holders. When placing an order, specify the type of material from the following five: SUS304, SUS316, Hastelloy B, Hastelloy C, or Titanium.

■ Accessories Required for Connecting Electrodes to the BF-□(R) (Order Separately)

Electrode Shorter than 1 m

The following items are required for each pole.

• 1 x F03-01 Electrode
• 1 x F03-03 Lock Nut

The Electrode can be cut anywhere to a desired control level.

Note: 1. The spring washer comes with the lock nut.
2. Refer to F03-□ for details on Electrodes, Connecting Nuts, Lock Nuts, and Separators.

Electrode Longer than 1 m

The following items are required for every additional meter of electrode for each pole.

• 1 x F03-01 Electrode
• 1 x F03-02 Connecting Nut
• 2 x F03-03 Lock Nuts

Use F03-14 1P Separators to prevent the electrodes from touching each another.
Dimensions

Note: All units are in millimeters unless otherwise indicated.

**BF-1**

- Weight: approx. 75 g

**BF-3(R)**

- Weight: BF-3: approx. 210 g
  - BF-3R: approx. 215 g

**BF-5(R)**

- Weight: BF-5: approx. 360 g
  - BF-5R: approx. 365 g

**BS-1(S)**

- Weight: approx. 70 g

**BS-1**

- Connecting nut SUS304 (provided)
  - Two, M4 P = 0.7

**BS-1S**

- Terminal bolt, SUS304 (M4) P = 0.7
  - Connecting nut SUS304 (provided)
  - Two, M4 P = 0.7

**BS-1S1**

- Terminal bolt, SUS304 (M4) P = 0.7
  - Connecting nut SUS304 (provided)
  - Two, M4 P = 0.7

**BS-1S2**

- Terminal bolt, SUS304 (M4) P = 0.7
  - Connecting nut SUS304 (provided)
  - Two, M4 P = 0.7

**BS-1S1**

- Taper pipe thread PT1/2
- JIS B 0203

**BS-1S2**

- M18 P=1.5
- M18 P=1.5
### Safety Precautions

Refer to *Safety Precautions for All Level Controllers.*

<table>
<thead>
<tr>
<th>Material</th>
<th>SUS304</th>
<th>SUS316</th>
<th>Titanium</th>
<th>Hastelloy B</th>
<th>Hastelloy C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Approx. 55 g</td>
<td>Approx. 55 g</td>
<td>Approx. 45 g</td>
<td>Approx. 65 g</td>
<td>Approx. 60 g</td>
</tr>
</tbody>
</table>

1. The clamping section is made of fluororesin.
2. If it is not necessary to seal the tank inside and outside, the Electrode can be secured with F03-18 Nuts. (Refer to page 1.)
3. The material of the Connecting Nuts is the same as the material of the BS-1T. Connecting Nuts made of hastelloy B, hastelloy C, or titanium, however, do not have the screw or screw hole labeled 2-M4 in the figure.
4. The section shown with dotted lines is sold separately.

**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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