


## 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

Application	Model
<ul style="list-style-type: none"> <li>• Liquid with low specific resistance For 1-pole electrode</li> </ul>	BF-1
<ul style="list-style-type: none"> <li>• When sturdy mounting is required For 3-pole electrode For 3-pole electrode (2-wire) For 5-pole electrode For 5-pole electrode (2-wire)</li> </ul>	BF-3 BF-3R BF-5 BF-5R
<ul style="list-style-type: none"> <li>• Applications where resistance to high-temperature, high-pressure is required For 1-pole electrodes, 250°C, 1.96 MPa</li> </ul>	BS-1 BS-1S BS-1S1 BS-1S2
<ul style="list-style-type: none"> <li>• 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</li> </ul>	BS-1T SUS304 BS-1T SUS316 BS-1T TITANIUM BS-1T HAS B BS-1T HAS C

### ■ Accessories (Order Separately)

Application	Model
Protective Cover (For PS-□S and BF-3/-4/-5)	F03-11
Protective Cover (For B□-1 and B□-1S)	F03-19
M18 Nut (For BS-1)	F03-17
M18 Nut (For BS-1T)	F03-18

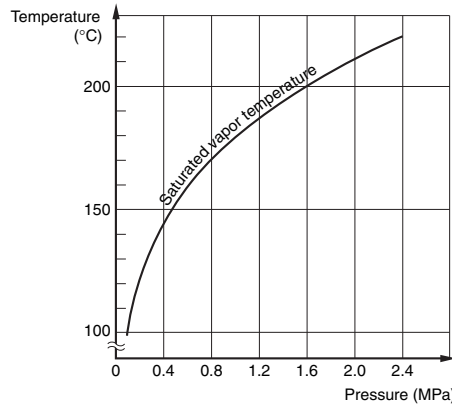
**Note:** Refer to *Installing an Electrode Holder on a Tank* under Level Controller Installation in the Technical Guide for Level Controllers for information on Level Controller installation. Refer to *PS-□S(R) Electrode Holder Accessories (Order Separately)* for dimensions.

## Specifications

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

- 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.

Pressure-Temperature Curve



**Example**

For a pressure of 1.6 MPa, the temperature inside the water tank must be at least 200°C.

## Appearance

<p><b>BF-1</b></p> <p>Tightening torque: 2.25 N-m Heat resistance: 70°C Heat resistance: 150°C</p>	<p><b>BF-3(R) BF-5(R)</b></p> <p>Tightening torque: 2.25 N-m Heat resistance: 70°C Heat resistance: 150°C (See note 1.)</p>	<p><b>BS-1</b></p> <p>Maximum terminal tightening torque: 137.2 N-cm Heat resistance: 150°C Heat resistance: 250°C Material at clamping section: iron (standard) SUS304 and SUS316 are also available. (See note 2.)</p>	<p><b>BS-1T</b></p> <p>SUS Hastelloy Titanium (See note 3.)</p>
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Note: 1. The F03-11 Protective Cover (sold separately) is available.

2.

Model	Material at tightening section	Screws
BS-1	Iron	M18 P = 1.5
BS-1S	SUS304	M18 P = 1.5
BS-1S1	SUS304	PT1/2
BS-1S2	SUS316	M18 P = 1.5

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.

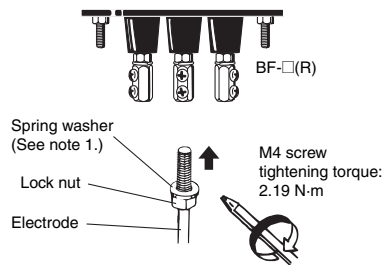
## Accessories Required for Connecting Electrodes to the BF-□(R) (Order Separately)

### Electrode Shorter than 1 m

The following items are required for each pole.

- 1 × F03-01 Electrode
- 1 × 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.

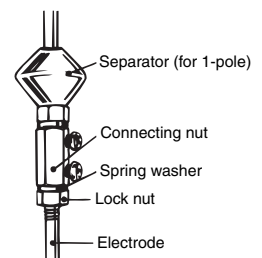
2. Refer to F03-□ for details on Electrodes, Connecting Nuts, Lock Nuts, and Separators.

### Electrode Longer than 1 m

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

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

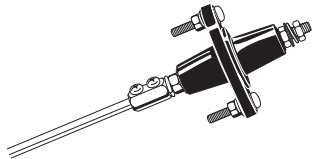
Use F03-14 1P Separators to prevent the electrodes from touching each other.



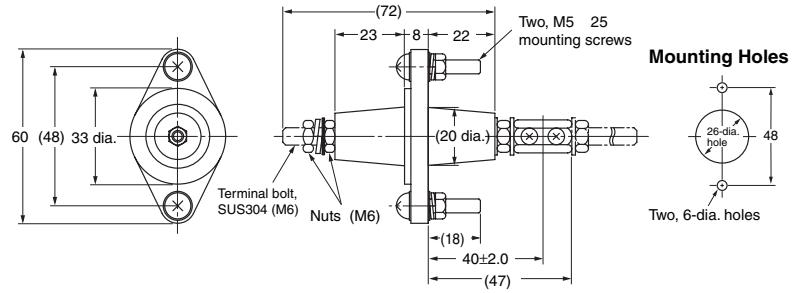
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

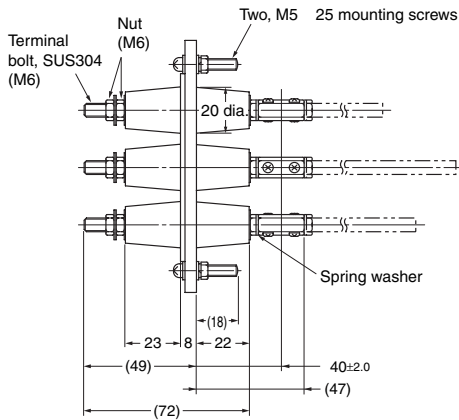
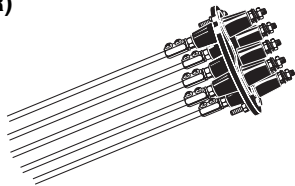
## BF-1



Weight: approx. 75 g

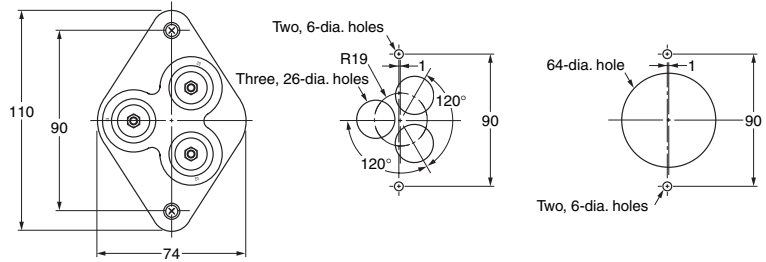


## BF-3(R) BF-5(R)



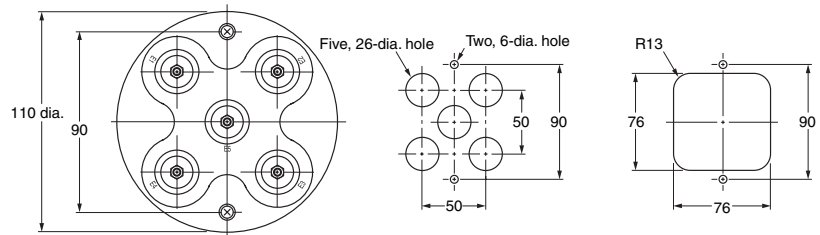
## BF-3(R)

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

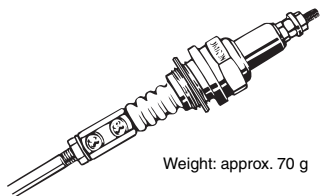


## BF-5(R)

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

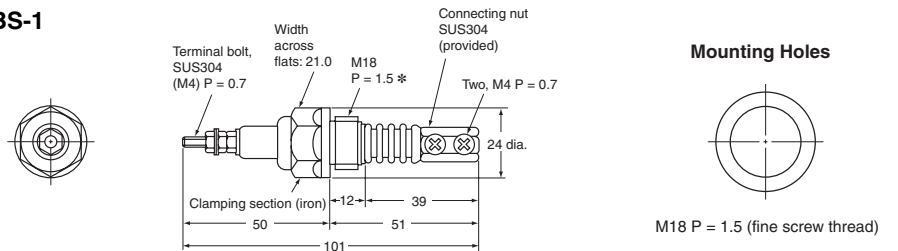


## BS-1(S)



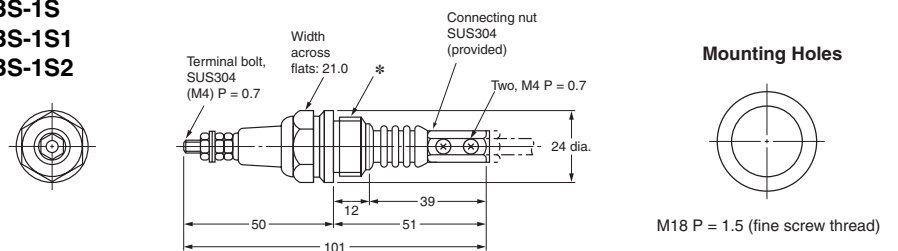
Weight: approx. 70 g

## BS-1



\*. If it is not necessary to seal the tank inside and outside.  
The Electrode can be secured with F03-17 Nuts.  
(Refer to page 1.)

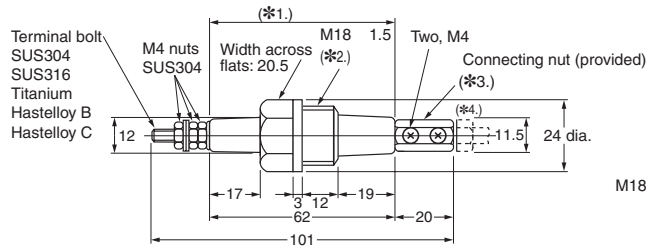
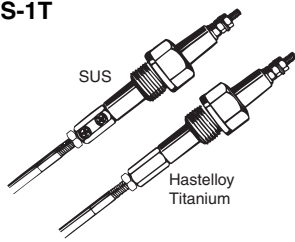
## BS-1S BS-1S1 BS-1S2



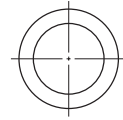
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BS-1S	BS-1S1	BS-1S2
M18 P=1.5	Taper pipe thread PT1/2 JIS B 0203	M18 P=1.5

## BS-1T



### Mounting Holes



M18 P = 1.5 (fine screw thread)

<b>Material</b>	SUS304	SUS316	Titanium	Hastelloy B	Hastelloy C
<b>Weight</b>	Approx. 55 g	Approx. 55 g	Approx. 45 g	Approx. 65 g	Approx. 60 g

- \*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, hastello 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.

## ■ Safety Precautions

Refer to *Safety Precautions for All Level Controllers*.

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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