



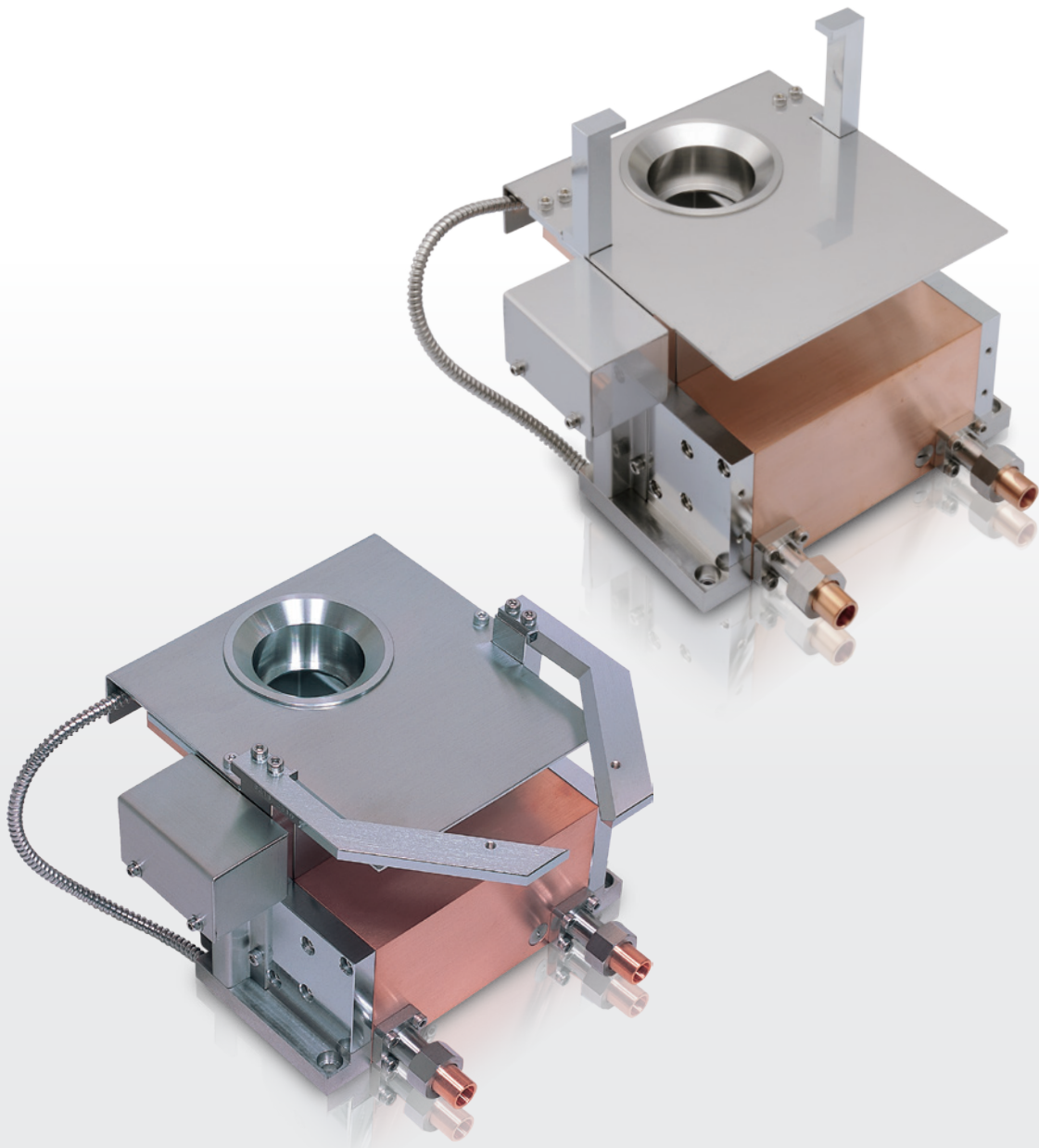
Industrial Equipment

Electron Beam Source for Electron Beam Deposition

Solutions for Innovation

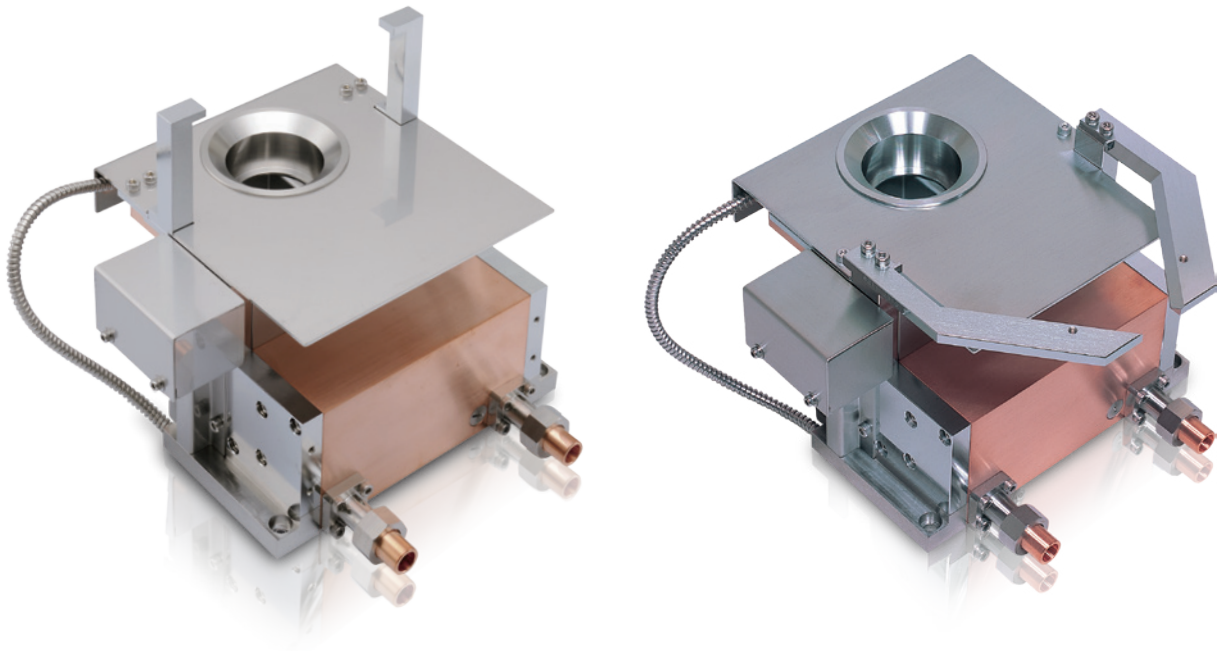
JEBG·BS-60 / JST·BS-ICE Series

Electron Beam Sources and Power Supplies



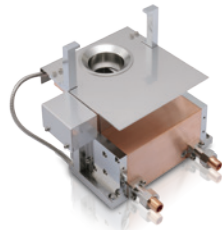
JEOL Ltd.

Electron Beam Source for Electron Beam Deposition JEBG/BS-60 Series

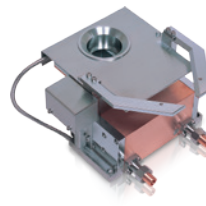


Product lineup

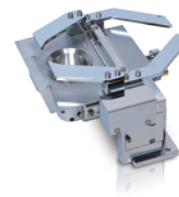
BS-60070DEBS



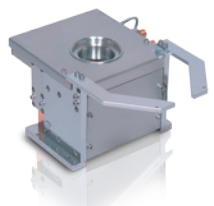
BS-60060DEBS



JEBG-102UH0



BS-60050EBS



	For oxide films			
Maximum output ^{*1}	6.4 kW	6.4 kW	10 kW	10 kW
Accelerating voltage (operating)	-4 kV to -8 kV	-4 kV to -8 kV	-4 kV to -10 kV	-4 kV to -10 kV
Variable accelerating voltage ^{*3}	Available	Available	Available ^{*4}	Available
Beam deflection angle	270°	270°	180°	270°
Magnet for beam deflection	Electromagnet	Electromagnet	Electromagnet	Electromagnet and permanent magnet
Filament form	0.8 dia. U-shape	0.8 dia. U-shape	0.55 dia. spiral	0.55 dia. U-shape
Filament assembly exchange mechanism	Top mount	Top mount	Side mount	Top mount
Beam sweeping range	± 20 mm	± 20 mm	± 10 mm	50 mm dia.
Beam position movement range	± 20 mm	± 20 mm	± 10 mm	50 mm dia.
Suppression of reflected electrons	N/A	Equipped	Optional	Equipped
Arcing-preventing structure	Available	Available	N/A	N/A
Page	3	4	5	6

*1 Output when accelerating voltage is maximum. Also limited by the maximum output of the EB source power supply.

*2 The power supply output is restricted for JEBG-203UA0 and JEBG-303UA, so the output limit is 16 kW. (When combined with JST-16F)

Features

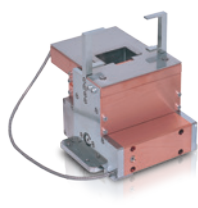
For oxide films

The beam incidence is perpendicular to the deposition material, and the beam spot is nearly a perfect circle.
 Film thickness distribution is excellent, ideal for oxide films.
 Offers superior electron beam control for high-speed sweeping.
 With excellent suppression of reflected electrons, depending on the model.
 Optimal for production applications, with high reproducibility and yield.

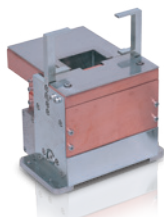
For metallic films

Supports a wide selection of crucibles, enabling high-rate, multi-type, and large-volume deposition.
 By using the optional Scan Controller, multi-element films can be formed with 2 or 3-source simultaneous deposition.
 With BS-6021 ODEM low-temperature film formation is possible due to the suppression of reflected electrons.

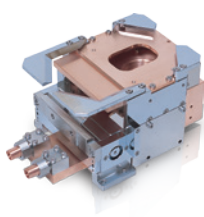
BS-60040VDGN



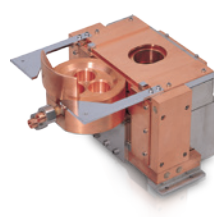
BS-60030DGN



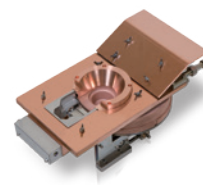
JEBG-203UAO



JEBG-303UA



BS-6021 ODEM
BS-6021 I DEM



For oxide films/metallic films		For metallic films		
10 kW	10 kW	20 kW ^{*2}	30 kW ^{*2}	10 kW
-2 kV to -10 kV	-4 kV to -10 kV	Maximum -12 kV	Maximum -15 kV	-4 kV to -10 kV
Available	N/A	N/A	N/A	N/A
270°	270°	270°	270°	270°
Electromagnet and permanent magnet	Permanent magnet	Permanent magnet	Permanent magnet	Permanent magnet
0.55 dia. U-shape	0.55 dia. U-shape	0.8 dia. spiral	0.8 dia. spiral	0.8 dia. linear
Top mount	Top mount	Side mount	Side mount	Side mount
± 20 mm	± 20 mm	± 10 mm	± 25 mm	50 mm dia.
± 20 mm	± 20 mm	± 10 mm	± 25 mm	50 mm dia.
N/A	N/A	Optional	Optional	Available
N/A	N/A	N/A	N/A	N/A
6	7	7	8	9

*3 The deflection magnetic field control can be performed from the EB source power supply. The accelerating voltage can be changed without opening the chamber.

*4 Possible by changing the settings made at the time of shipment.

For oxide films

BS-60070DEBS

Variable accelerating voltage

The built-in deflection electromagnet makes it possible to control the deflection field from the EB source power supply. The accelerating voltage can be switched without venting the vacuum chamber.

Long-life filament

U-shaped, 0.8 dia. long-life type

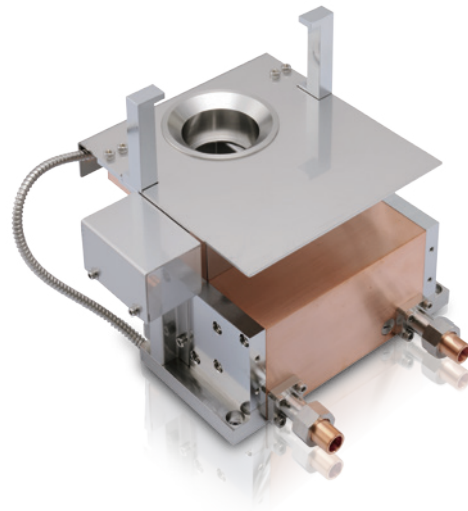
Superior maintainability

- Easy-to-clean form
- Filament assembly can be removed from above
- Easy filament replacement

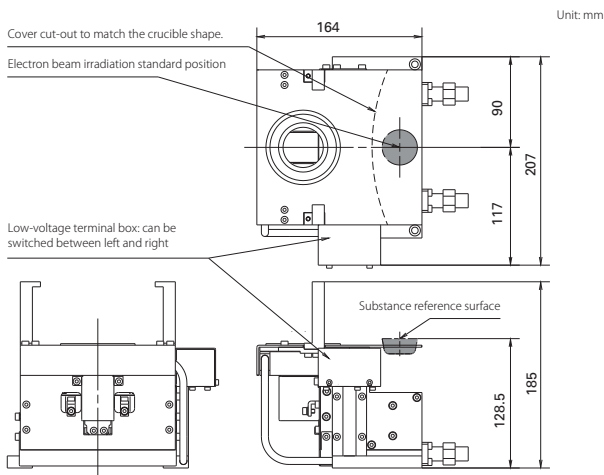
Compatible with the JEBG-102UHO electron beam source

Can replace from the JEBG-102UHO electron beam source without changing the crucible position.

*Mounting may not be possible for some layouts. Please inquire before ordering.



External dimensions



Specifications

Model	BS-60070DEBS
Maximum output	6.4 kW (8 kV, 0.8 A)
Variable accelerating voltage	Available (-4 kV to -8 kV)
Beam deflection angle	270°
Magnet for beam deflection	Electromagnet
Beam sweeping range	± 20 mm
Beam position movement range	± 20 mm
Crucible	Not included (special order)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.2 to 0.35 MPa)
External dimensions (mm)	207 (W) × 164 (D) × 185 (H) (Inlet, protrusions, and tubes are not included)
Mass	Approximately 11 kg

* The maximum output is limited by the maximum output of the power supply.

Arcing-preventing structure

The BS-60070DEBS and BS-60060DEBS are designed to reduce the occurrence of arcing due to sudden pressure increases inside the electron beam source, compared to conventional electron beam sources.

Pressure: 0.1 Pa, Ar 400 mL/min
Output: 8 kV, 0.3 A, 10 min
Material: Ta₂O₅
EB source power supply: JST-16F

For oxide films

BS-60060DEBS

Suppression of reflected electrons

Significant reduction in the quantity of reflected electrons reaching the substrate

Variable accelerating voltage

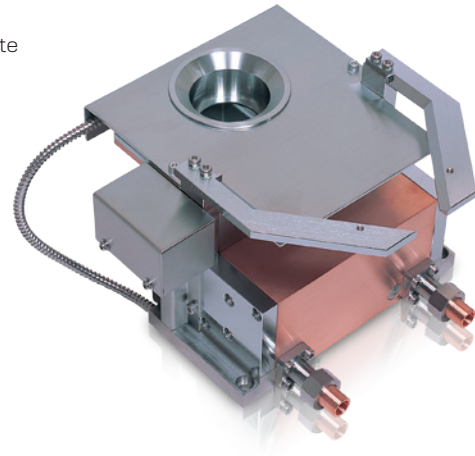
The built-in deflection electromagnet makes it possible to control the deflection field from the EB source power supply. The accelerating voltage can be switched without venting the vacuum chamber.

Long-life filament

U-shaped, 0.8 dia. long-life type

Superior maintainability

- Easy-to-clean form
- Filament assembly can be removed from above
- Easy filament replacement

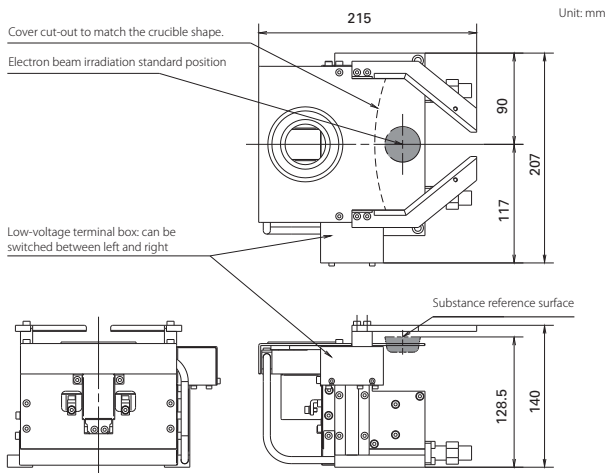


Compatible with the JEBG-102UHO electron beam source

Can replace from the JEBG-102UHO electron beam source without changing the crucible position.

*Mounting may not be possible for some layouts. Please inquire before ordering.

External dimensions

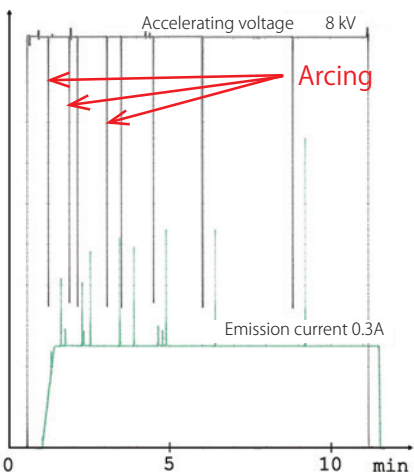


Specifications

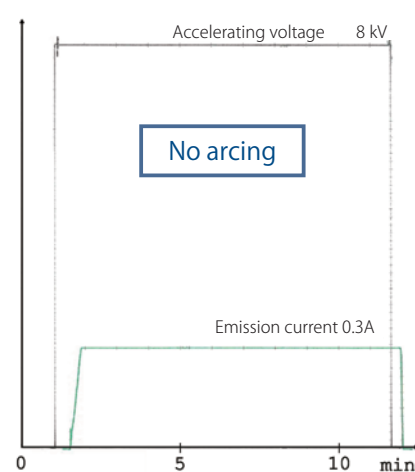
Model	BS-60060DEBS
Maximum output	6.4 kW (8 kV, 0.8 A)
Variable accelerating voltage	Available (-4 kV to -8 kV)
Beam deflection angle	270°
Magnet for beam deflection	Electromagnet
Beam sweeping range	± 20 mm
Beam position movement range	± 20 mm
Crucible	Not included (special order)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.2 to 0.35 MPa)
External dimensions (mm)	207 (W) × 215 (D) × 140 (H) (Inlet, protrusions, and tubes are not included)
Mass	Approximately 11 kg

* The maximum output is limited by the maximum output of the power supply.

Conventional electron beam source



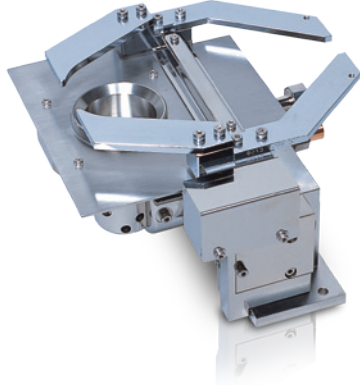
BS-60070DEBS / BS-60060DEBS



For oxide films

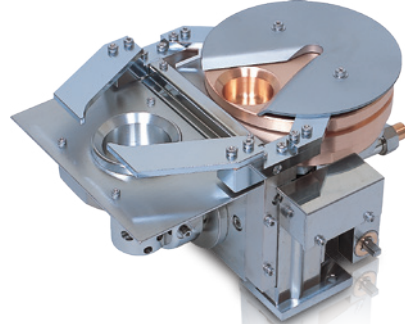
JEBG-102UH0

Best Seller for Optical Films
Achieve excellent melted mark



For oxide films

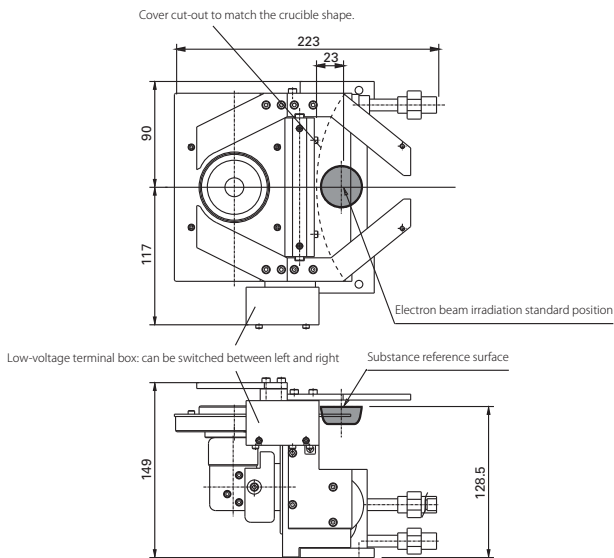
EBG-102UB6S EBG-102UB6S



EBG-102UB6S

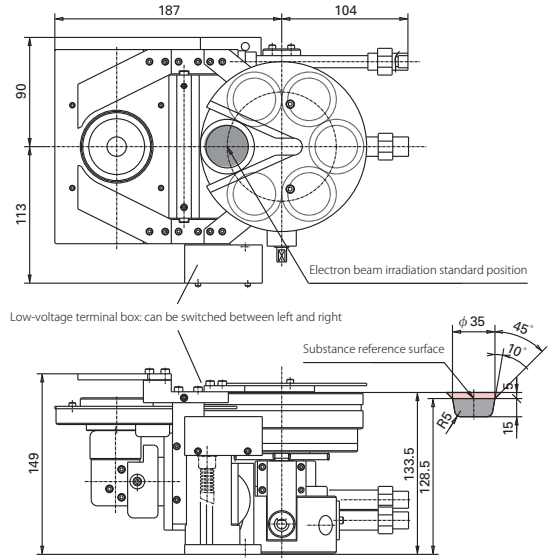
External dimensions

Unit: mm



External dimensions

Unit: mm



Specifications

Model	JEBG-102UH0
Maximum output	10 kW (10 kV, 1 A)
Variable accelerating voltage	Available (-4 kV to -10 kV) * Possible by changing the settings made at the time of shipment.
Beam deflection angle	180°
Magnet for beam deflection	Electromagnet
Beam sweeping range	± 10 mm
Beam position movement range	± 10 mm
Crucible	Not included (special order)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	207 (W) × 223 (D) × 149 (H) mm (Including inlet and low-voltage terminal box)
Mass	Approximately 8 kg

* The maximum output is limited by the maximum output of the power supply.

Specifications

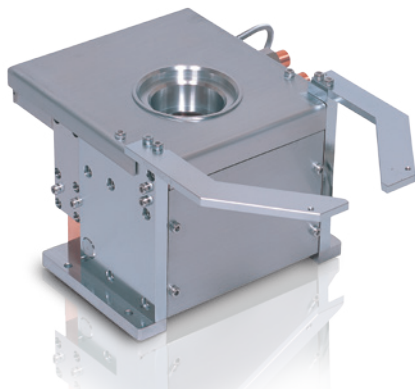
Model	EBG-102UB6S / EBG-102UB4S
Maximum output	10 kW (10 kV, 1 A)
Variable accelerating voltage	Available (-4 kV to -10 kV) * Possible by changing the settings made at the time of shipment.
Beam deflection angle	180°
Magnet for beam deflection	Electromagnet
Beam sweeping range	± 10 mm
Beam position movement range	± 10 mm
Crucible	12 mL × 6 points / 12 mL × 4 points
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	8 to 10 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	203 (W) × 291 (D) × 149 (H) (Including inlet and low-voltage terminal box)
Mass	Approximately 16 kg

* The maximum output is limited by the maximum output of the power supply.

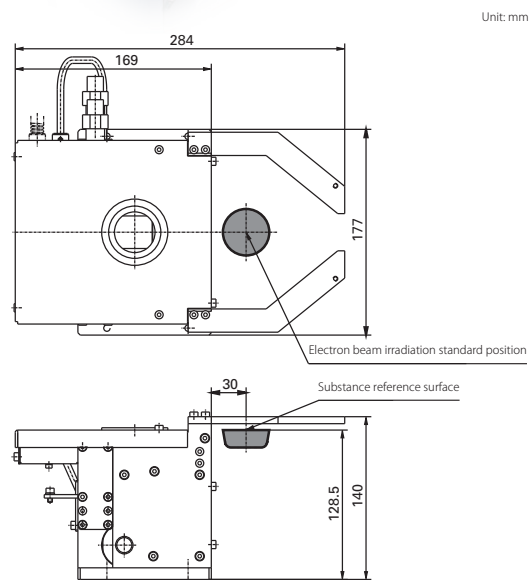
For oxide films/metallic films

BS-60050EBS

Suppression of reflected electrons
Variable accelerating voltage
Long-life filament
Superior maintainability



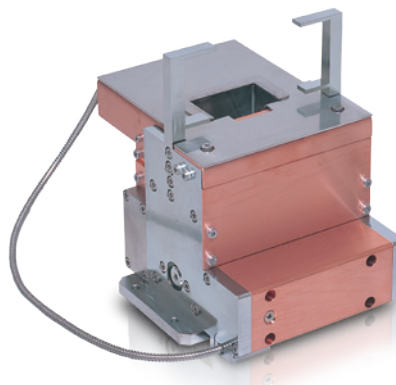
External dimensions



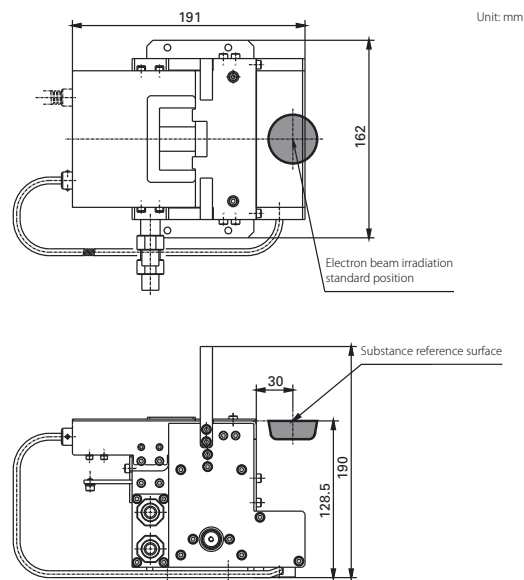
For oxide films/metallic films

BS-60040VDGN

Variable accelerating voltage
Long-life filament



External dimensions



Specifications

Model	BS-60050EBS
Maximum output	10 kW (10 kV, 1 A)
Variable accelerating voltage	Available (-4 kV to -10 kV)
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet and electromagnet
Beam sweeping range	Maximum dia. 50 mm (at 6 kV)
Beam position movement range	Maximum dia. 50 mm (at 6 kV)
Crucible	Not included (special order)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	177 (W) × 284 (D) × 140 (H) (Inlet, protrusions, and tubes are not included)
Mass	Approximately 14 kg

* The maximum output is limited by the maximum output of the power supply.

Specifications

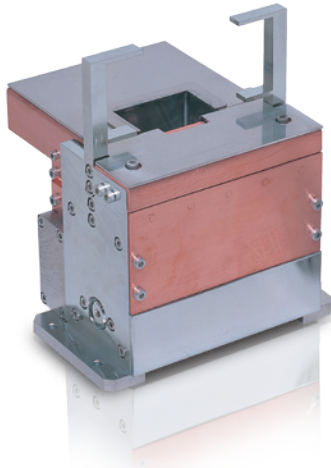
Model	BS-60040VDGN
Maximum output	10 kW (10 kV, 1 A)
Variable accelerating voltage	Available (-2 kV to -10 kV) * To use for operation at -4 kV or less, additional modification of the power supply is required.
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet and electromagnet
Beam sweeping range	± 20 mm
Beam position movement range	± 20 mm
Crucible	Not included (available as a special order)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	162 (W) × 191 (D) × 190 (H) (Inlet, protrusions, and tubes are not included)
Mass	Approximately 10 kg

* The maximum output is limited by the maximum output of the power supply.

For oxide films/metallic films

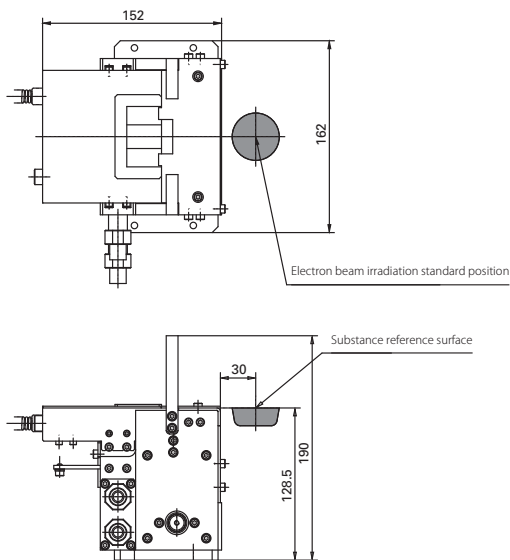
BS-60030DGN

Long-life filament



External dimensions:

Unit: mm



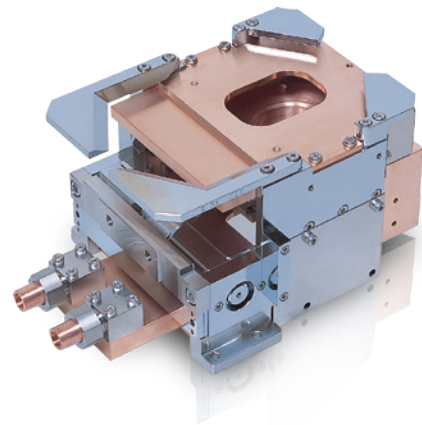
Specifications

Model	BS-60030DGN
Maximum output	10 kW (10 kV, 1 A)
Variable accelerating voltage	N/A
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet
Beam sweeping range	± 20 mm
Beam position movement range	± 20 mm
Crucible	Not included (available as a special order)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	162 (W) × 152 (D) × 190 (H) mm (Inlet and protrusions are not included)
Mass	Approximately 9 kg

* The maximum output is limited by the maximum output of the power supply.

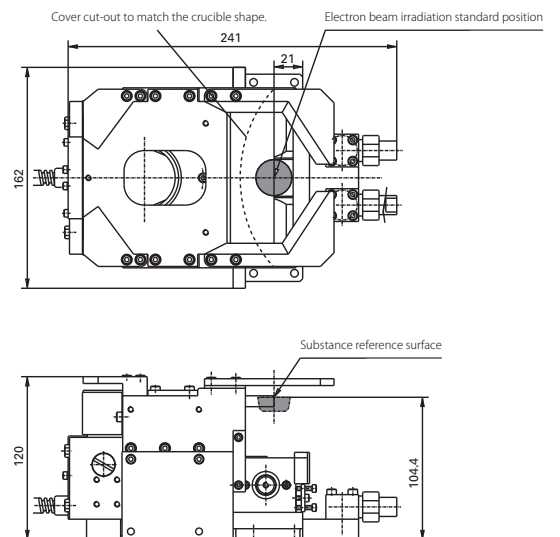
For metallic films

JEBG-203UA0



External dimensions

Unit: mm



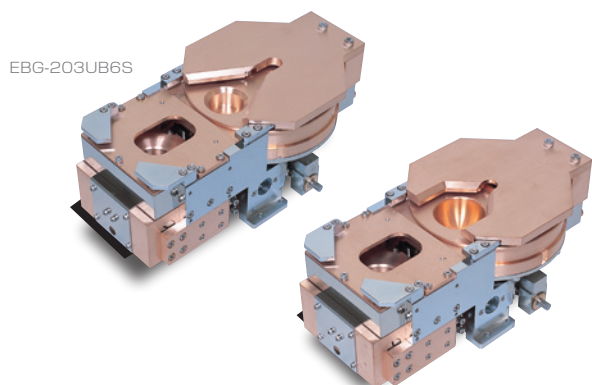
Specifications

Model	JEBG-203UA0
Maximum output	20 kW (12 kV, 1.7 A)
Variable accelerating voltage	N/A
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet
Beam sweeping range	± 10 mm
Beam position movement range	± 10 mm
Crucible	Not included (available as a special order, optional crucible)
Operating pressure	5×10 ⁻⁵ to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	162 (W) × 241 (D) × 120 (H) mm (Including inlet and low-voltage terminal box)
Mass	Approximately 8 kg

* The maximum output is limited by the maximum output of the power supply.

For metallic films

EBG-203UB6S EBG-203UB4H



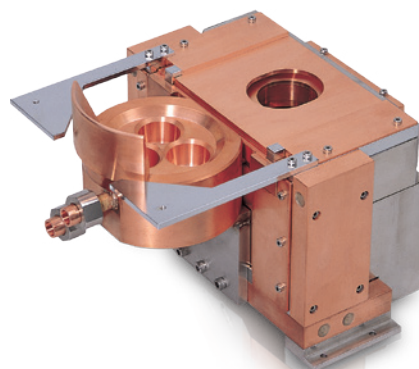
EBG-203UB6S

EBG-203UB4H
High-rate crucible for metals

For metallic films

JEBG-303UA

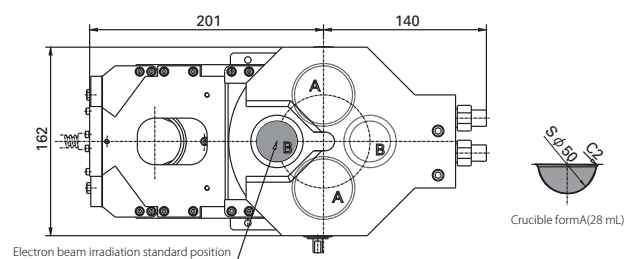
Suitable for High-Output, Large-Surface Sweep



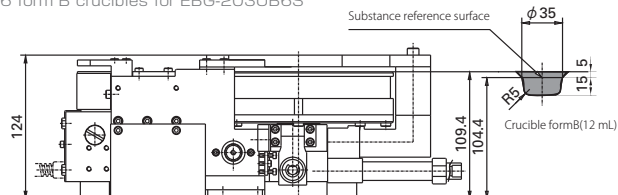
* Shown with optional crucible EBG-30T3B attached
(Triple pockets type)

External dimensions

Unit: mm

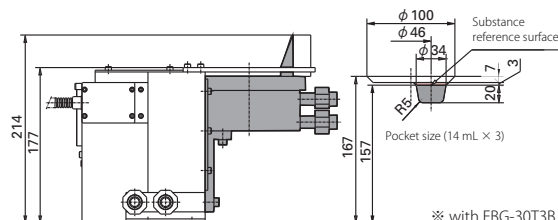
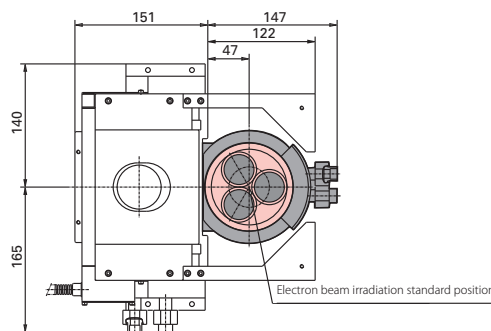


* 6 form B crucibles for EBG-203UB6S



External dimensions

Unit: mm



※ with EBG-30T3B

Specifications

Model	EBG-203UB6S / EBG-203UB4H
Maximum output	20 kW (12 kV, 1.7 A)
Variable accelerating voltage	N/A
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet
Beam sweeping range	± 10 mm
Beam position movement range	± 10 mm
Crucible	12 mL × 6/12 mL × 2 (Other optional crucibles available) 28 mL × 2
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	8 to 10 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	162 (W) × 341 (D) × 124 (H) mm (including inlet)
Mass	Approximately 19 kg

* The maximum output is limited by the maximum output of the power supply.

Specifications

Model	JEBG-303UA
Maximum output	30 kW (15 kV, 2 A)
Variable accelerating voltage	N/A
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet
Beam sweeping range	± 25 mm
Beam position movement range	± 25 mm
Crucible	Options (Single/triple × 1 point/3 points/4 points)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	8 to 10 L/min (Water temperature 10 to 25°C, differential pressure 0.15 to 0.3 MPa)
External dimensions (mm)	305 (W) × 298 (D) × 214 (H) mm (including inlet and EBG-30T3B)
Mass	Approximately 24 kg

* The maximum output is limited by the maximum output of the power supply.

For metallic films

BS-60210DEM BS-60211DEM

Low-temperature/Low-damage

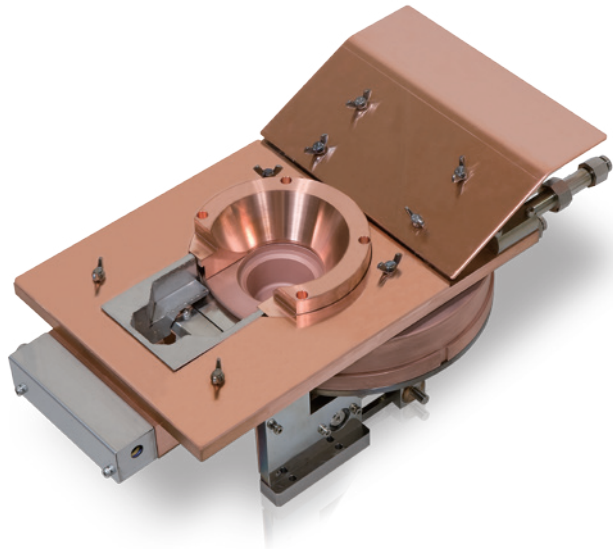
A high-efficiency backscattered electron trap is equipped in the standard configuration. Significantly reduces the temperature increase of the substrate during high-rate deposition of metallic materials. Also reduces the damage to substrate and sub-layers caused by exposure to reflected electrons.

Thick film/Multi-layer deposition

Large capacity 40 mL crucible (4 or 6 pockets) enables thick-film deposition and multi-layer coatings with multiple materials.

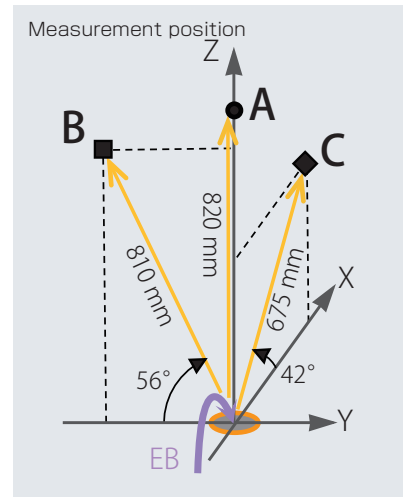
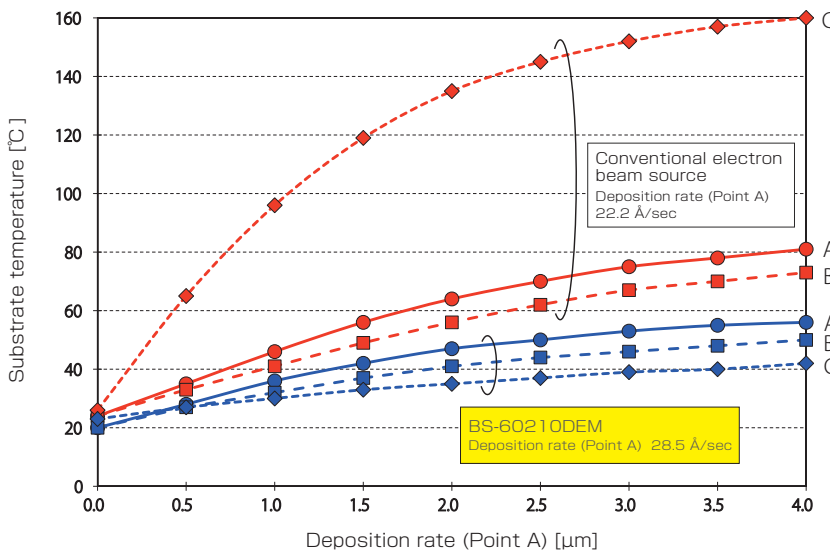
Cross-contamination prevention

Prevents contamination from a different evaporation material from an adjacent crucible pocket.



Application Data

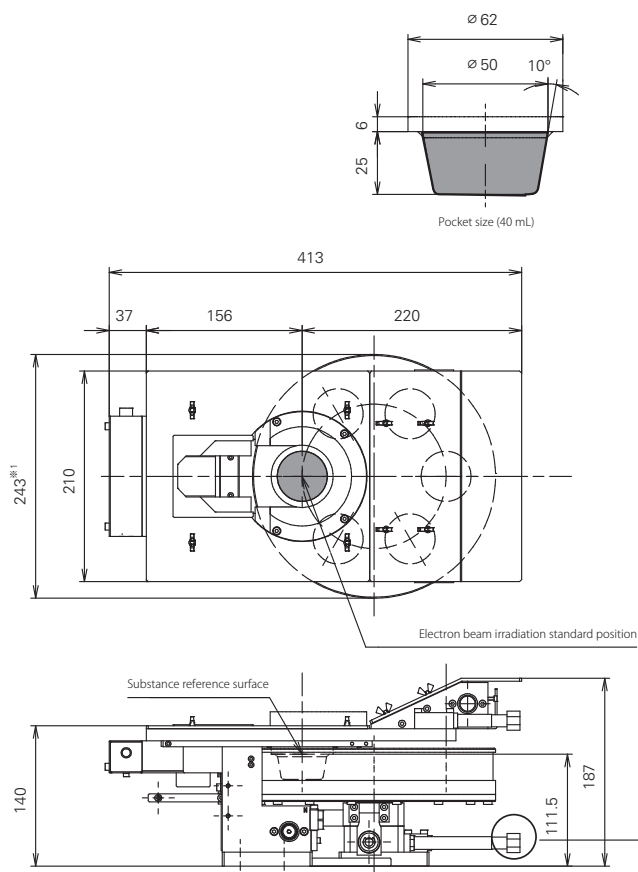
Comparison of substrate temperature increase during Al deposition



Point A: directly above the evaporation source
Point B: Above the Y-axis, at 56° in the Z-direction
Point C: Above the X-axis, at 42° in the Z-direction

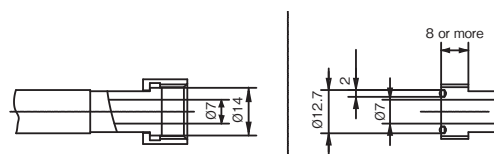
External dimensions

Unit:mm

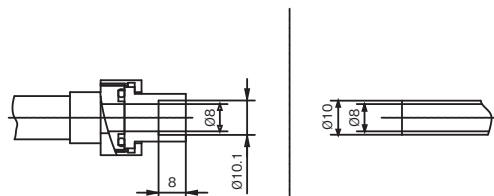


* For a 4 pocket crucible/Drive section, this dimension will be 220 mm.

BS-60210DEM / BS-60140H4M / BS-60150H6M



BS-60211DEM / BS-60141H4M / BS-60151H6M



Specifications

Beam source

Model ^{*1}	BS-60210DEM / BS-60211DEM
Maximum output ^{*2}	10 kW (10 kV, 1 A)
Accelerating voltage (operating)	-4 kV to -10 kV
Variable accelerating voltage	N/A
Beam deflection angle	270°
Magnet for beam deflection	Permanent magnet
Beam sweep pitch	50 mm dia. (from center of the crucible)
Beam position movement	50 mm dia. (from center of the crucible)
Operating pressure	5×10 ⁻⁵ Pa to 7×10 ⁻² Pa
Cooling water flow rate	5 to 8 L/min (Water temperature 10 to 25°C, differential pressure 0.2 to 0.35 MPa)
External dimensions (mm)	243 ^{*3} (W) × 413(D) × 187(H) mm
Mass	Approximately 18 kg

Multi-pocket crucible unit

Model ^{*1}	BS-60140H4M	BS-60150H6M
	BS-60141H4M	BS-60151H6M
Number of crucible pockets:	4 pockets	6 pockets
Pocket size	50 mm dia. × H25 mm	
Pocket capacity	40 mL	
Cooling water	7 to 12 L/min (Water temperature 10 to 25°C, differential pressure 0.2 to 0.35 MPa)	
Mass	Approximately 16 kg	Approximately 19 kg

*1 Model varies according to differences in the water inlet

*2 The maximum output is limited by the maximum output of the power supply.

*3 For a 4 pocket crucible/Drive section, this dimension will be 220 mm.

BS-ICE Series

Improved yield

- Standard configuration includes XY sweep, Circle sweep, Line sweep
- Easy setting of melted mark adjustment, allowing improved reproducibility of the deposition distribution

Reduction of particle splash

- The high-speed responsiveness of the accelerating voltage and arcing prevention circuitry enable high-speed arcing-prevention control. This allows a significant improvement in re-deposition of materials around the crucible and in splashing of the evaporation material due to e-beam instantaneous movement at the time of arcing in the electron beam source.

More convenient process management

- Digital displays make possible to numerically manage the detailed settings for the electron beam source, enabling easy monitoring and management of the source status.
- The status of the EB source power supply can be checked, even without a measurement instrument. Technical follow-up and trouble-shooting can be performed remotely, providing remarkable improvements in response times.
- By using the standard, built-in arc counter function, it is possible to numerically view the trends of arc occurrence number and frequency, providing information about the degree of contamination inside the chamber and the status of the electron beam source.

Energy-efficient

- High-efficiency, energy-saving power supply (power consumption improved by about 10%) *Compared to previous models



Specifications

Model	BS-72010ICE	BS-72020ICE	BS-72050ICE
Specifications	1 EB source	1 EB source	2 EB sources
Maximum output	4.8 kW	10 kW *	10 kW *
Variable accelerating voltage	-1 kV to -6 kV	-2 kV to -10 kV	-2 kV to -10 kV
Power supply input (50/60 Hz)	3 phase, 180 V to 242 A 7 kVA	3 phase, 180 V to 242 A 15 kVA	3 phase, 180 V to 242 A 16 kVA
External dimensions (mm)	570 (W) × 700 (D) × 1,000 (H)	570 (W) × 700 (D) × 1,400 (H)	570 (W) × 700 (D) × 1,400 (H)
Mass	140 kg	180 kg	200 kg
Grounding	10 Ω or less	10 Ω or less	10 Ω or less

* Total of 2 units when 2 EB sources are used simultaneously.

Comparison to the JST-F Power Supply

Model	BS-ICE Power supply	JST-F Power supply
XY sweep	Standard	Standard
Circle sweep	Standard	Option (supported by the BS-64010SCT Scan Controller)
Line sweep	Standard	
Arbitrary position sweep	-	
External signal	Standard: Input 20 types / Output 35 types	Standard: Input 16 types / Output 9 types (When the optional ST-EXTSIG is used: Input 18 types/Output 21 types)
Arc suppressor	Standard	Option (ST-AS10F or ST-AS10G)
2 EB source simultaneous output	Standard: BS-72050ICE N/A: BS-72020ICE/BS-72010ICE	Option (ST-203)

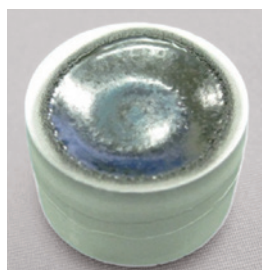
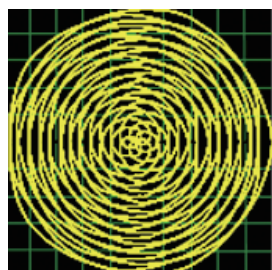
Improved yield

Multiple sweep modes included in the standard configuration

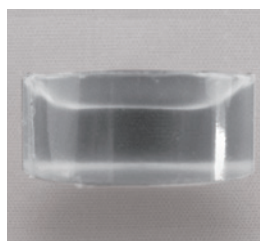
The standard configuration of the BS-ICE series power supplies includes XY sweep, Circle sweep, and Line sweep for annular hearths Improved yields with excellent melted marks.

Examples of melted shapes of deposition material after Circle sweep

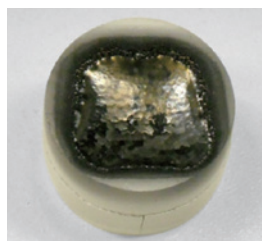
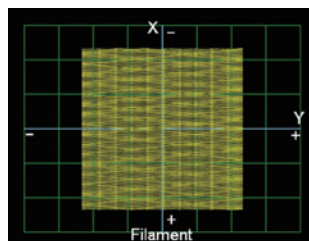
Circle sweep



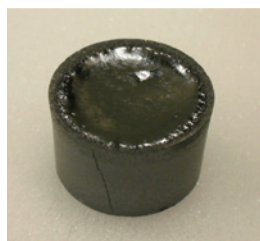
SiO₂ Dia. 32 × t12 mm
6 kV, 300 mA, 2 min



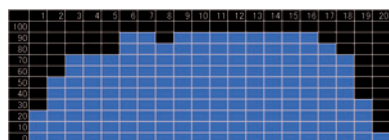
XY sweep



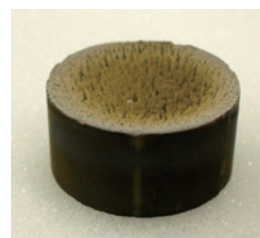
ZrO₂+TiO₂ Dia. 20 × t13 mm
6 kV, 400 mA, 2 min



Line sweep



SiO₂ Dia. 24 × t12 mm
6 kV, 80 mA, 1 min

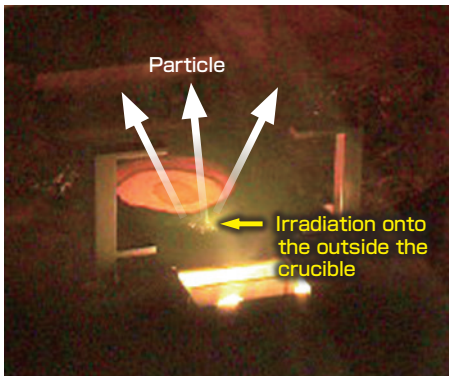


BS-ICE Series

Reduced Particles / Re-deposition of deposited material

A plate with TiO_2 adhered was placed in front of the crucible, and arcing was intentionally generated. It was confirmed that there were traces of electron beam irradiation on the plate.

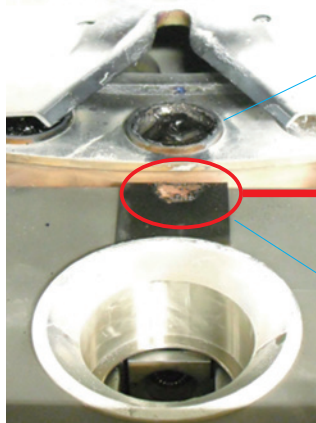
With the conventional power supplies, re-evaporation of the deposited material is observed. With the BS-ICE Series power supplies, however, there is no re-evaporation seen, making it possible to expect a reduction of contamination into the film.



As the electron beam moves instantly out of the pocket at the time of arcing occurrence, the deposits are re-evaporated, which is one cause of particle generation.

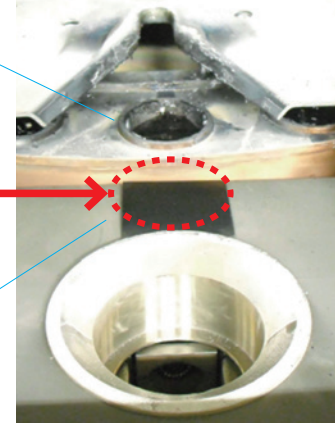
Test conditions: 6 kV, 400 mA output.
Intentionally induced arcing by injecting gas into the high-pressure inlet section.

Conventional power supply



Re-evaporation of deposited material

BS-ICE Power supply



No change

More convenient process management

A single multi-function remote controller can be used to perform the setting and control for 2 electron beam sources. All functions of the power supply can be accessed.

In addition to the same basic operations as those of the controllers for conventional power supply, it is also possible to easily enter numerical settings to adjust parameters like the sweep frequency, dwell time, and incidence angle.

Advanced special adjustments can be made while observing the beam.

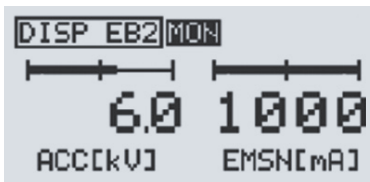
The internal power supply parameters can be displayed, allowing you to obtain the required information without using any tools or measuring devices.

This significantly improves service response during troubleshooting and technical support, and simplifies parameter management.

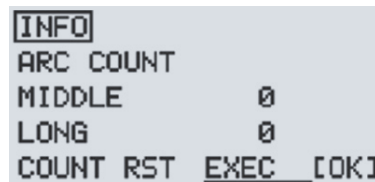


Remote control display

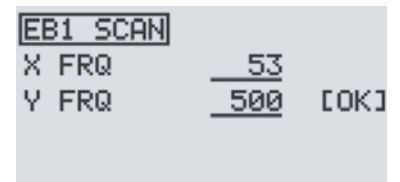
Basic screen Selectable from 3 types



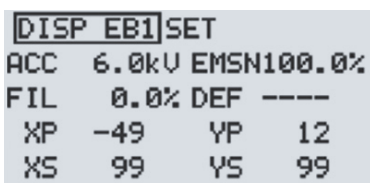
Arc counter function



Sweep frequency setting



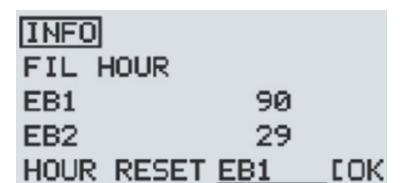
Basic screen Displays up to 8 types of information



Details of alarm information

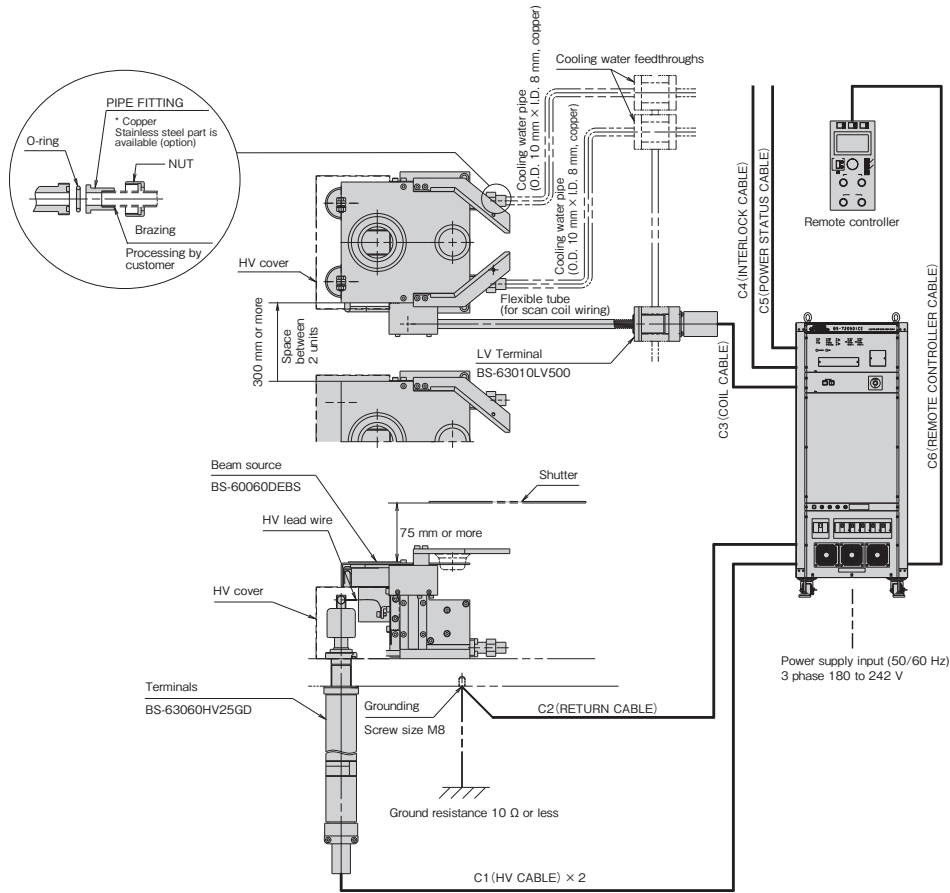


Cumulative filament use time



Cable configuration (BS-ICE)

Optional Products



Type	Name	Model	Length:	Number required	
				1 EB source	2 EB sources
C1	HV cable (2 cables/set)	BS-64100C1	5.5 m		
		BS-64110C1	10 m	1 set (2 cables)	2 set (4 cables)
		BS-64120C1	15 m		
C2	Return cable	BS-64130C2	5.5 m		
		BS-64140C2	10 m	1 set (1 cable)	2 set (2 cables)
		BS-64150C2	15 m		
C3	Coil cable	BS-64161C3	6.5 m		
		BS-64171C3	10 m	1 set (1 cable)	2 set (2 cables)
		BS-64181C3	15 m		
C4	Interlock cable	BS-64190C4	6 m		
		BS-64220C4	10 m	1 set (1 cable)	1 set (1 cable)
C5	Power status cable	BS-64280C4	20 m		
		BS-64200C5	6 m		
		BS-64230C5	10 m	1 set (1 cable)	1 set (1 cable)
C6	Remote controller cable	BS-64290C5	20 m		
		BS-64301C6	5 m		
C6	Remote controller cable	BS-64310C6	10 m	1 set (1 cable)	1 set (1 cable)
		BS-64211C6	15 m		
(C7)	Status convert cable	BS-64240C7	10 m	1 set (2 cables)	1 set (2 cables)
		BS-64250C7	15 m		
(C8)	Signal convert cable	BS-64260C8	10 m	1 set (3 cables)	2 set (6 cables)
		BS-64270C8	15 m		

Signal Converter Unit BS-64330CNV

When a JST-F Series EB source power supply incorporated in a vacuum deposition system is replaced with a BS-ICE Series EB source power supply, the BS-64330CNV Signal Converter Unit is a unit for converting an external control signal to a signal for the ICE power supply, without the need for any modification of the control system of the vacuum deposition system. When this unit is used, C4 and C5 must be replaced with C7 and C8.



JST-F Series



Power supply main unit

Arc suppressor
* Option
Incorporated in the power supply main unit



Operation panel

* When 1 electron source is used, can be housed in the power supply main unit (Option)



Remote controller

* Can be attached/detached from the operation panel

Specifications

Model		JST-3F	JST-10F	JST-16F
Output	Maximum output	6.4 kW	10 kW	16 kW
	Accelerating voltage	-4 kV to -8 kV	-4 kV to -10 kV	
	Emission current	0 to 0.8 A	0 to 1 A	0 to 1.6 A
	Filament current	Maximum 40 A		
	Accelerating voltage ripple rate	5% or less (maximum output)		
Deflection coil output		0 to 2 A		
Sweeping coil output		Maximum frequency 500 Hz(*), Maximum output 8 Ap-p, ± 2 A DC		
Interlock		External: 3 points, Internal 5 points		
External signal		INPUT : 16 types, OUTPUT: 9 types		
Power supply input (50/60 Hz)		3 phase 200 V ± 10%, 10 kVA	3 phase 200 V ± 10%, 15 kVA	3 phase 200 V ± 10%, 25 kVA
External dimensions	Power supply main unit	570 mm (W) × 760 mm (D) × 1,545 mm (H)		
	Operation panel	481 mm (W) × 300 mm (D) × 150 mm (H)		
Mass		Approximately 360 kg	Approximately 390 kg	Approximately 450 kg
Grounding		Ground resistance 10 Ω or less		

* The frequency used will vary according to the electron beam source

Attachments

ST-AS10F/ST-AS10G Arc Suppressor

Suppresses arcing during electron beam evaporation. Suppresses noise during arcing, and prevents interruption of the vapor deposition. ST-AS10F has a 2 stage arcing suppression circuit, and ST-AS10G has a 1 stage arcing suppression circuit.



ST-AS10G

Model	ST-AS10F	ST-AS10G
Applicable accelerating voltage/ current	-4 kV to -10 kV 1.6 A or less	
Operating pressure	6×10^{-2} Pa or less	
Interruption time of the electron beam	0.5 ms or less *	0.1 ms or less
Accelerating voltage overshoot during recovery	20% / 3 ms or less	
Increased current of the rectifier wave during arcing	1 A, 100 μ S or less	

* Interrupt time during operation up to the 2nd stage

ST-203 Simultaneous Multi Electron Beam Source Unit

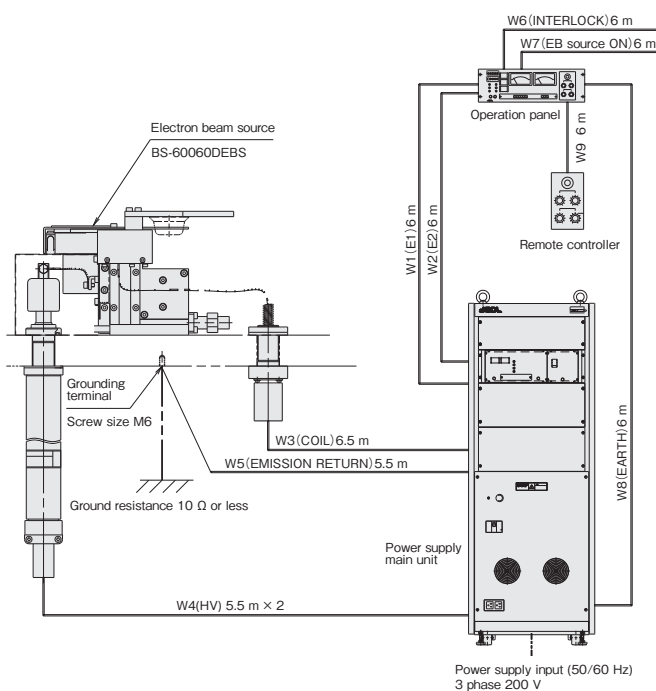
This is used when 2 electron beam sources will be used simultaneously with 1 power supply. There will be 2 operation panels, each one is assigned for dedicated operation of one of the 2 electron beam sources.

It is possible to use different types of electron beam sources, but there may be limitations on the accelerating voltage range, etc. depending on the combination.

ST-EXTSIG External Signal Control

Incorporated in to the operation panel. In addition to the standard 9 types of external control signals, enables the external output of various other signals, such as the emission current confirmation signal.

Cable configuration



Type	Name	Model	Length:
W1 W2 W8	E1/E2/ grounding	BS-64410L06W128	6 m
		ST-10MW128	10 m
		ST-15MW128	15 m
W3 W4	Coil/HV (2 coils)	BS-64420L06W34	6.5 m / 5.5 m
		ST-10MW34	10 m
		ST-15MW34	15 m
W5	Emission return	BS-64430L06W5	5.5 m
		ST-10MW5	10 m
		ST-15MW5	15 m
W6 W7	Interlock/EB source ON	BS-64440L06W67	6 m
		ST-10MW67	10 m
		BS-64540L15W67	15 m
W9	Remote	BS-64450L06W9	6 m
		ST-10MW9	10 m
		ST-15MW9	15 m

Scan Controller

BS-64010SCT

With the JST-F Series, adjustment of the melted marks can be easily performed using software on a PC.

- The beam spot dwell time can be adjusted visually
- Wide variety of settings available, including sweep form, peaking, position, sweep frequency, and tilt angle

Sweep patterns can be created for each type of material, and up to 15 patterns can be saved for each electron beam source.

- Simply specify the memory No. to instantly switch to the saved sweep pattern settings
- Even when the sweep pattern is changed, there is no need to adjust the power supply
- After saving to the internal memory of the unit, a different PC can be used with no loss of data
- When 2 electron beam sources are used, a total of 30 patterns can be saved



* The PC and RS-232C connection cable are not included.

Melted marks improved by Scan Controller

No adjustment
X sweep waveform Scan frequency: 135 Hz

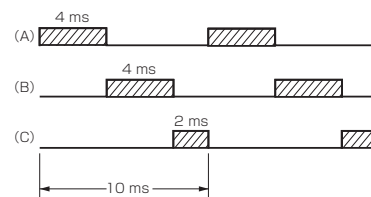
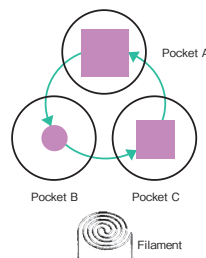
Annular fused quartz
300 dia. × 230 dia. × t15 mm

6 kV 280 mA
Quartz ring rotation speed
30° / 250 sec.
Sweep repeated 3 times on the same side (30°) / 250 sec.

Optimized with the Scan Controller.
X sweep waveform Sweep frequency: 30 Hz

Triple Source Controller

ST-TRIPLE (F)



When the emission current is set to A = 200 mA, B = 200 mA, C = 100 mA (total current 500 mA), the irradiation time ratio is 2:2:1

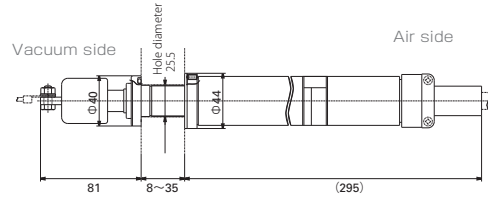
When combined with the JST-F power supply, enables 3-source deposition with a single electron beam source. Three adjacent spots in the crucibles are rapidly irradiated with the electron beam in 10 ms cycles.

The irradiation time for each beam can be set using an output ratio (A:B:C). It is also possible to set the sweep width and position for each irradiation location,

High-voltage terminals BS-63060HV25GD

* 2 pieces per set

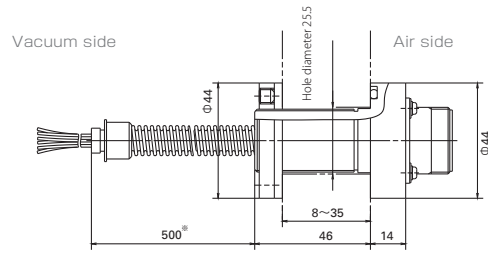
Unit: mm



Low-voltage terminal BS-63010LV500 (500 mm spec.)

BS-63020LV750 (750 mm spec.)
 BS-63040LV450 (450 mm spec.)
 BS-63030LV350 (350 mm spec.)

Unit: mm



* 750 mm, 450 mm, and 350 mm are available.

Filament

P/N 801236843

10 pcs/box



0.55 dia. spiral
For 102

P/N 780034732

10 pcs/box



0.8 dia. spiral
For 203/303

* Can also be used with 102

P/N 801247683

10 pcs/box

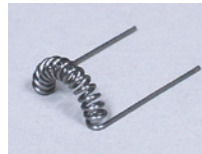


Open center 0.8 dia.
For 203/303

* Can also be used with 102

P/N 812180313

5 pcs/box



0.55 dia. U-shape
For 60030/40/50
Reinforced leads
P/N 864351704

P/N 864353545
(Old P/N820463507)

5 pcs/box



0.8 dia. U-shape
For 60060/60070

P/N 780407369

5 pcs/box



0.8 dia. linear
For 60210/60211

Filament assembly

P/N 780449746



For 102

P/N 780449754



For 203

P/N 789400481



For 60030/60040

P/N 864559348



For 60050

P/N 780406940



For 60060/60070

P/N 783106645



For 60210/60211
* Filament is not included.

Assemble tool for Filament Assembly

Makes it possible to easily assemble the Filament Assembly with good reproducibility

P/N 780405005



Assembly tools for 102 EBG-102 TOOL (TOOL SET)

P/N 780405030



Assembly tools for 203 EBG-203 TOOL (TOOL SET)

Specifications are guaranteed when no modification or addition is made, and are subject to change without notice.

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