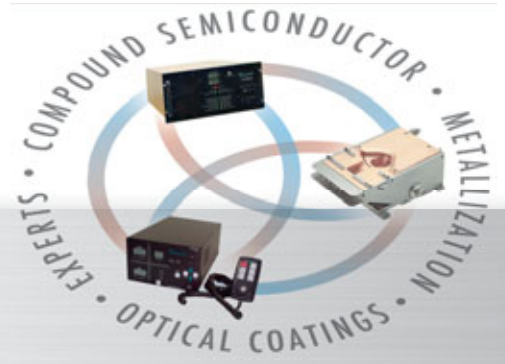


# Temescal



## TEMESCAL SIMBA 2 ELECTRON BEAM POWER SUPPLY

Temescal's Simba 2 is a constant-voltage, 15-kW electron beam power supply designed to power and control up to three electron beam sources simultaneously. Compatible with sources employing either permanent magnet or electromagnetic deflection, the Simba 2 power supply provides stable output at all levels as well as adaptability, ease of integration, and safety and convenience for operating and service personnel.

The Simba 2 power supply is capable of continuously delivering -10 kV at 1.5 A as well as filament power for up to three electron beam sources. This high level of output power makes it possible to achieve substantial deposition rates in the most demanding production environments.



### FEATURES & BENEFITS

- 15 kW of high-voltage output for simultaneous operation of up to three electron beam sources
- Linearly adjustable voltage output
- Constant voltage in either of two user-selectable ranges
- Current control programmable in any of four ranges, ensuring excellent low-power stability
- Tetrode tube high-voltage regulation to  $\pm 1\%$
- Constant emission current regulation to  $\pm 1\%$
- Adjustable arc suppression settings on HV regulator
- Prewired for quick and easy expansion to two or three output channels
- Completely safety interlocked for maximum operator and equipment protection

**FerroTec**

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## Output Options

Multiple voltage and current ranges enhance the versatility of the Simba 2. The power supply operates in user-selectable voltage ranges of -3 to -7 kV and -6 to -10 kV. Voltage output is linearly adjustable within each range and regulated to  $\pm 1\%$ . The gun control circuit enables the user to define four emission current ranges for each e-gun, ensuring excellent low-power stability. Each gun's emission current is fully adjustable within each range and independently regulated to  $\pm 1\%$ .

The entire 15-kW high-voltage output can be delivered to one electron beam source or shared among up to three sources operating simultaneously in one, two, or three vacuum chambers. For multigun applications in any configuration, the unique high-voltage circuit of the Simba 2 prevents operating fluctuations in one source from being transferred to the other sources.

## Regulation and Stability

Voltage is regulated to  $\pm 1\%$  by a tetrode tube that acts as a massive variable resistor to counteract the effects of ripple, line voltage fluctuation, and voltage sag due to high current drain. The result is a constant voltage level that enables the user to maintain a tight beam spot and to achieve higher evaporation rates at a given power level. The regulation circuit also provides highly accurate voltage control, instantaneous arc-down recovery, and constant ground reference. The tetrode tube is air cooled, so no plumbing need be supplied to the power supply.

## Remote Control Unit(s)

The basic remote controller consists of an HV Control panel and a Gun Control panel. HV controls include an HV ON/OFF keyswitch, HV ON and OFF switches, an HV adjustment pot, and a Local/Remote switch. The meter on the HV Control panel displays user-selectable HV or total power supply current. Gun controls include gun ON and OFF switches, emission and bias current controls, a Local/Remote switch, and a longitudinal coil current control. The Gun Control panel's meter displays user-selectable filament current, emission current, or longitudinal coil current. Multigun Simba 2 kits include a separate Gun Control panel for each additional e-beam gun.



Simba 2 HV/Gun Controller

The power supply incorporates all essential internal interlocks and provides connectivity for numerous external interlocks plus a 24 VDC source for the customer's external interlock switch closures.

### Interlock LEDs on the HV Control Panel

- OUT OF REG: Power supply is not regulating HV to within 1% of setpoint and automatic cutback series failed to restore regulation.
- PWR ON: The main power circuit breaker is closed and line voltage is applied to the control transformer.
- AIR: Cooling air is flowing to the socket and base seals of the tetrode tube.
- DOORS: Power module front and rear panels are in place.
- PCB'S/KEY: All PCBs are powered up and the ON/OFF keylock on the HV Control panel is in the ON position.

### Interlock LEDs on Gun Control Panel(s)

- INT COVERS: The top cover of the gun interface chassis is in place.
- TANK: The interlocked doors and panels on the evaporation system are in place.
- VAC GAUGE: The source chamber vacuum gauge is reading within the set limits.
- AUX: Auxiliary interlock channel; can be connected to any sensor or controller provided by the customer
- GUN WATER: Cooling water is flowing in the electron beam gun.
- POSITION: The longitudinal coil current output to the e-gun's emitter is within the set limits.

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## Modular Design

Modular design makes it easy to integrate the Simba 2 power supply into any evaporation system. The compact, caster-mounted power module has been designed for ease of movement and small footprint. The 19-inch-rack mountable gun interface chassis can be configured to support up to three e-guns, with a filament power supply, an emission regulator, dual high-voltage relays, and an optional position control PCB for each gun. The half-panel HV/gun controller and the quarter-panel single gun controller are also designed for a standard 19-inch (483 mm) rack.

## Optional Beam Position Interlocks

The power supply's optional Position PCB provides control over the current delivered to the longitudinal deflection coil of an electron beam source. Controls on this optional board enable the operator to set high and low interlock limits for the gun's longitudinal coil current, ensuring that the e-beam is switched off before it is driven beyond the target material in the longitudinal axis.

## Maximum Protection

With its carefully designed relays, interlocks, and circuit breakers, the Simba 2 provides complete equipment protection and maximum safety for operating personnel. Two high-voltage vacuum relays supply protection for each e-gun. When a gun is switched off, the relay conducting power to that gun opens. The other relay then closes, providing contact to ground that gun's emitter assembly.

## SPECIFICATIONS

<b>High-Voltage Output</b>	15 kW at 10 kV, supporting up to three e-guns simultaneously Fully adjustable within either of two output ranges, -3 kV to -7 kV or -6 kV to -10 kV Regulated to $\pm 1\%$	<b>Beam Sweep Capability</b>	Available with optional programmable sweep
<b>Beam Current</b>	Fully adjustable from 0 to 1.5 A Regulated to $\pm 1\%$	<b>Power Module Weight</b>	720 lbs. (324 kg)
<b>Gun Filament Transformer Output</b>	12 VAC, 70 A maximum per source	<b>Dimensions</b>	
<b>Longitudinal Coil Current Output</b>	Adjustable from 0 to 3 A into a 5-ohm load	Power module	40 in. H x 27-3/4 in. D x 23-1/4 in. W (1016 mm x 705 mm x 590 mm)
<b>Remote Control Inputs</b>		Gun interface chassis	7 in. H x 19 in. W (178 mm x 483 mm), rack mountable
HV request	0 to +10 VDC	Remote controller	5-1/4 in. H x 19 in. W (133 mm x 483 mm), rack mountable
Emission current request	0 to +10 VDC	<b>Utility Power for Power Module</b>	
<b>Digital Meters</b>		208/240 VAC model	208/240 VAC, 50/60 Hz, 80 A (90-A inrush), 3-phase delta (4-wire cable; no neutral required)
HV control panel	0 to 15 kV or total power supply current, 0 to 2.0 A FS	380 VAC model	380 VAC, 50/60 Hz, 50 A (60-A inrush), 3-phase delta
Gun control panel	emission, filament, or longitudinal coil current, 0 to 2.0 A FS	480 VAC model	440/480 VAC, 50/60 Hz, 40 A (50-A inrush), 3-phase delta
<b>Tetrode Tube</b>	Air cooled. Provides accurate voltage control, voltage regulation to $\pm 1\%$ , and constant ground reference.	<b>Environment</b>	Must be free of corrosive fumes and vapors Ambient temperature must remain between 50° to 90° F (10° to 32° C) Humidity: 50% maximum

# TEMESCAL SIMBA 2 ELECTRON BEAM POWER SUPPLY

## ORDERING INFORMATION

Single-Gun Simba 2 Power Supply	Part Number
Single-gun Simba 2, 208/240 VAC input power	06611-7330-1
Single-gun Simba 2, 380 VAC input power	06611-7330-2
Single-gun Simba 2, 480 VAC input power	06611-7330-3

Two-Gun Simba 2 Power Supply	Part Number
Two-gun Simba 2, 208/240 VAC input power	06611-7330-12
Two-gun Simba 2, 380 VAC input power	06611-7330-22
Two-gun Simba 2, 480 VAC input power	06611-7330-32

Three-Gun Simba 2 Power Supply	Part Number
Three-gun Simba 2, 208/240 VAC input power	06611-7330-13
Three-gun Simba 2, 380 VAC input power	06611-7330-23
Three-gun Simba 2, 480 VAC input power	06611-7330-33

Filament Transformer and Cable Kits (Order one kit for each Simba 2 ordered)	Part Number
For single-gun Simba 2 units: Single filament transformer and 20-ft. HV cable	0040-7520-0
For single-gun Simba 2 units: Single filament transformer and 40-ft. HV cable	0040-7520-1
For two-gun Simba 2 units: Two filament transformers and two 20-ft. HV cables	0040-7520-02
For two-gun Simba 2 units: Two filament transformers and two 40-ft. HV cables	0040-7520-12
For three-gun Simba 2 units: Three filament transformers and three 20-ft. HV cables	0040-7520-03
For three-gun Simba 2 units: Three filament transformers and three 40-ft. HV cables	0040-7520-13

Recommended Accessory	Part Number
SuperSweep 64 programmable beam sweep controller, fully digital	0611-8570-0

# Temescal

[www.Temescal.net](http://www.Temescal.net)

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