Temescal

TEMESCAL MODEL CV-6SLX ELECTRON BEAM POWER SUPPLY

The Temescal Model CV-6SLX is a 6-kW, constant-voltage switching power supply designed to power and control one electron beam source. The CV-6SLX power supply is compatible with sources featuring either permanent or electromagnetic deflection.

Delivering up to 10 kV at 0–600 mA, the model CV-6SLX makes it possible to achieve substantial deposition rates in production environments. The power supply also offers stable output at all voltage levels, rapid arc recovery, ease of integration, and safety and convenience for operating as well as service personnel.

FEATURES & BENEFITS

- **Reliable, stable power delivery**
  - – HV linearly adjustable from 0 to 10 kV
  - – Emission current linearly adjustable from 0 to 600 mA
  - – Solid-state HV regulation to within ± 0.5%
  - – Constant emission current regulation to within ± 0.5%
  - – Arc recovery within 2.5 ms
- **Autobias control feature maintains optimal bias voltage as filament ages**
- **14 front panel fault-indicator LEDs**
- **Rear-panel diagnostic port facilitates in-depth fault analysis, when necessary**
- **Front panel HV and emission current meters**
- **Ready access for servicing and adjustment**
  - – Easily removed covers on HV and filament power modules
  - – PCB-mounted adjustment pots
- **Easily integrated power module, with safety protection for equipment and personnel**
  - – Rack mountable
  - – Compact and lightweight (55 lbs. total)
  - – Air cooled
  - – Completely safety interlocked
- **CE certified**

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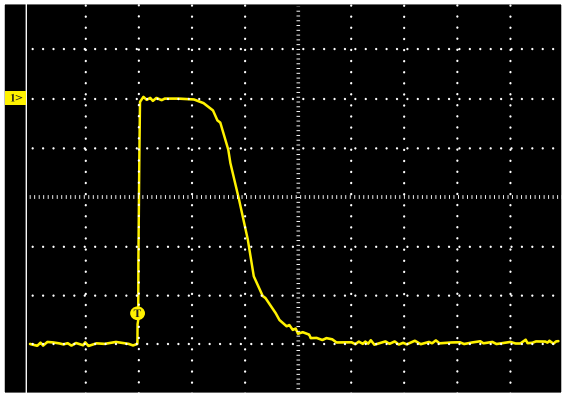
FerroTec

CV-6SLX ELECTRON BEAM POWER SUPPLY

Reliable, Fully Regulated Output

The CV-6SLX is capable of continuously delivering 10 kV at 600 mA, as well as filament power. This level of output makes it possible to achieve substantial deposition rates in the most demanding production environments. Because input power is choke-input filtered and fully rectified, HV output is unaffected by power line fluctuation, ripple, voltage sag, or frequency variation. High voltage and emission current are both regulated to within ±0.5%, with the HV regulated by a high-frequency switching inverter. The resulting HV stability ensures a consistently tight beam spot, yielding optimal evaporation rates at any power level.

CV-6SLX Arc Recovery Waveform



Arc event to full voltage recovery in approximately 2.5 ms.
Graph scales are: X = 1 ms/division; Y = 2 kV/division

Rapid, Robust Arc Recovery

The CV-6SLX features acute arc sensing, rapid power cutback capabilities, and arcdown recovery times within 2.5 ms. With an output circuit robust enough to survive the most protracted cutback-and-recovery cycles, the CV-6SLX is ideal for optical applications, where water molecules, adsorbed by the powdered media, often trigger intense microarcing during the predeposition phase. Power supplies designed merely to cut power in response to such microarc flurries liberate the water from these media very slowly. In some cases, such power supplies may prove incapable of completely exhausting the water from the target material.

The Model CV-6SLX applies a higher average power level to the target material, compared with conventional power supplies, ensuring that water is more quickly and effectively liberated from the media and pumped away. For fabs dedicated to these optical applications, the benefits of the CV-6SLX over conventional power supplies include higher reliability, a reduction in maintenance downtime, and improved run-by-run efficiency, yielding higher productivity.

Interlocks

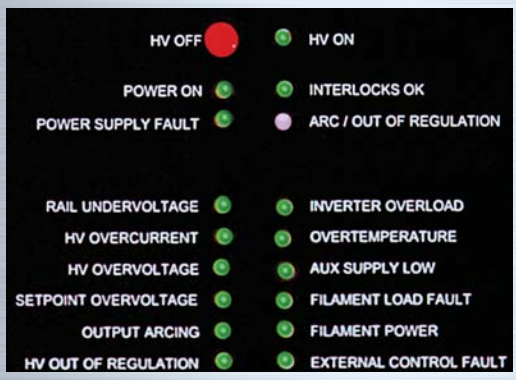
The Model CV-6SLX incorporates all internal interlocks required to ensure reliable operation and the protection of personnel and equipment. External interlocks can also be supplied via the power supply's remote-I/O interface.

TemEBeam™ EBC Integrated Controller

In evaporators without a PCL-based system controller., the TemEBeam EBC Integrated Controller provides the sole means of controlling the E-Beam power supply. In such systems, the EBC is therefore a required accessory for the CV-6SLX. Using the EBC's touch screen (see illustration below), the user can switch the e-beam on/off or switch the high voltage and the gun on and off independently of each other. The EBC also enables the user to set the kV and the emission power setpoints and to monitor the emission and filament currents in real time. The EBC can be configured to operate in stand-alone mode or in conjuction with single- and multilayer deposition controllers or PLC-based system controllers.

The EBC's Operations>E-Beam Screen

HVPS Front Panel



Main Circuit Breaker Switch

High-Voltage Adjustment Pot

HV OFF Button

Display Meters
- Output Voltage (0–10 kV)
- Emission Current (0–600 mA)

Status LEDs
- Power ON
- HV ON

Fault Indicator LEDs

In the list below, LED names followed by asterisks are latching (i.e., Power Supply) faults. Unless otherwise noted, all LEDs turn red when the fault condition in question occurs.

- **Power Supply Fault.** One or more latching faults has occurred.
- **Rail Undervoltage.*** Inverter rail voltage is below 220 VDC on a 208-V unit or 427 VDC on a 400-V unit.
- **HV Overcurrent.*** HV output current is more than 105% of its maximum of 1200 mA.
- **HV Overvoltage.*** HV output voltage is more than 105% of its maximum of 10 kV.
- **Setpoint Overvoltage.*** HV output voltage is outside a ±5% tolerance range with respect to its setpoint value.
- **Output Arcing.*** Arc rate exceeds 200 arcs/sec., or continuous arcing persists for more than 120 sec.
- **HV Out of Regulation.** Turns yellow for 2 seconds each time the Arc/Out of Regulation LED flashes.
- **Interlocks OK.** Green when all interlocks (including power supply covers) are satisfied.
- **Arc/Out Of Regulation.** Flashes yellow when sub-threshold arcs occur or when HV is momentarily out of regulation for any other reason.
- **Inverter Overload.*** Inverter current has exceeded its maximum of 100 A.
- **Overtemperature.*** Inverter temperature above 67° C, or cooling fan failure.
- **Aux Supply Low.*** Nominal 24 VDC control voltage is below 19.5 VDC.
- **Filament Load Fault.** Turns red to indicate an open filament circuit (= filament broken or burnt out).
- **Filament Power.** Green when filament power supply is powered up.
- **External Control Fault.*** Fault in the I/O Switches Power circuit.

SPECIFICATIONS

Input Power	208 VAC +10%/–5%, 60 Hz, 30 A, 3-phase delta (4-wire), or 400 VAC +10%/–5%, 50 Hz, 20 A, 3-phase delta (5-wire)
High-voltage output	6 kW at 10 kV max. output; fully adjustable 0–10 kV; regulated to within ±5%
HV Circuit	Accurate voltage control Constant ground reference Instantaneous arc recovery Air-cooled
Beam Current	Fully adjustable from 0–600 mA; regulated to within ±5%
Power Module	Dimensions: 8.75 in. H × 19 in. W × 23 in. D Weight: 55 lbs.
Filament Power Supply	Input Power: 208 VAC ±10%, 3.5 A, 50/60 Hz, single-phase Output: 10 VAC, 50 A, 28.5 kHz max. Dimensions 6.5 in. H × 6.5 in. W × 11 in. D Weight: 10 lbs.
Environment	Must be free of corrosive vapors Ambient temperature: 40° C maximum Humidity: 10%–90%, noncondensing

CV-6SLX ELECTRON BEAM POWER SUPPLY

Ordering Information

CV-6SLX E-Beam Power Supply	Part Number
CV-6SLX power supply, 208 VAC input power	0620-9600-0
CV-6SLX power supply, 400 VAC input power	0620-9600-1

Both models include high-voltage power supply, one filament power supply, interconnect cables, HV output lead set, and a technical manual.

Tem EBeam EBC Integrated Controller	

In evaporators without a PCL-based system controller., the TemEBeam EBC Integrated Controller is a required accessory for the CV-6SLX, as it provides the sole means of controlling the power supply in such systems. For additional details about power supply control/monitoring using the EBC, see page 2 of this document.

TemEBeam EBC Integrated Controller with HVPS, FPS, and sweep control modules	PN 0620-7492-0
TemEBeam EBC Integrated Controller with HVPS, FPS, sweep, and turret control modules	PN 0620-7492-1

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