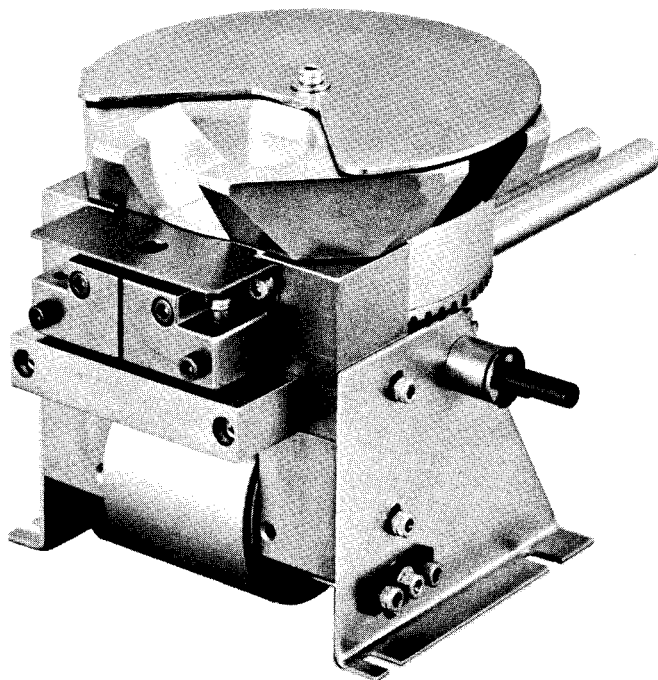


small capacity multihearth 180° electron beam gun

Sloan Part Number 000185



DESCRIPTION

The Sloan small-capacity multihearth electron beam gun offers high rates and efficiency in four individual water-cooled hearths. Each hearth is capable of holding more than 3.2 cc of source material. The hearths are mechanically rotated by a pinion gear and horizontal shaft mechanism which can be located on either side of the gun. A mechanical rotary feedthrough can be easily attached to this shaft for remote rotation of the hearths from outside the vacuum chamber. Each of the four hearths is accurately positioned for evaporation after each rotation by a precise detent. The remaining three hearths are completely shielded during evaporation to prevent source contamination.

This small capacity multihearth gun delivers in excess of 99% of the emission current to the source material, assuring a high level of operating efficiency. Power to the gun can be supplied by a Sloan Model Five/Ten Electron Beam Power Supply. At the maximum operating power of 6 kilowatts, the gun is capable of evaporating 8000 angstroms of aluminum per minute from each hearth on a substrate located 10 inches (25.4 cm) from the source. Evaporant exit angle from the hearth is approximately 60°.

The gun requires only simple routine maintenance. The filament can be changed quickly, and the complete gun can be readily disassembled for cleaning. The compact size of the gun allows installation in virtually any size vacuum chamber.

APPLICATIONS

The Sloan small capacity multihearth gun is specifically designed for vacuum deposition of high-purity thin films. It will evaporate virtually any source material and is suitable for all production thin-film applications. It is especially useful in the optical and microelectronic industries for the evaporation of conductors and dielectrics, or in applications where long, continuous runs are necessary. With four separate hearths, the gun provides an excellent means of depositing multilayer films. For even greater flexibility in an automated process, two multihearth guns can be mounted in a single chamber and programmed for either alternate or simultaneous operation.

SPECIFICATIONS

Operational:

Beam Voltage	10,000 volts
Beam Current	Up to 0.6 amperes
Maximum Power	6 kilowatts
Beam Arc	180°
Operating Pressure	Below 10 ⁻⁴ Torr
Electromagnet Supply	0.3 to 3 amperes, -10 volts maximum
Filament Supply	0 to 6 vac, 35 amperes maximum
Evaporant Exit Angle	60° approx.
Cooling Water Supply	2 gpm (7 liter/minute) minimum
Beam Spot Size	0.20" x 0.32" (0.51 x 0.81 cm) approx.
Hearth Volume	3.2 cc (each hearth)
Electrical Feedthrough Requirement	15 kV, 30 amperes, 2 conductors
Bakeout Temperature	250°C
Construction Materials	OFHC copper, magnet iron, stainless steel, molybdenum, alloy 155 silver solder, and nickel plating

Dimensions:

Hearth Size (each individual)	Rectangular with flat bottom, 3/4" W x 1" L x 3/8" D (2.0 cm x 2.5 cm x 1 cm)
Water Lines	3/8" (0.95 cm) dia.
Over-all Size	See dimensional drawing
Weight	8 lbs. (3.6 kg)