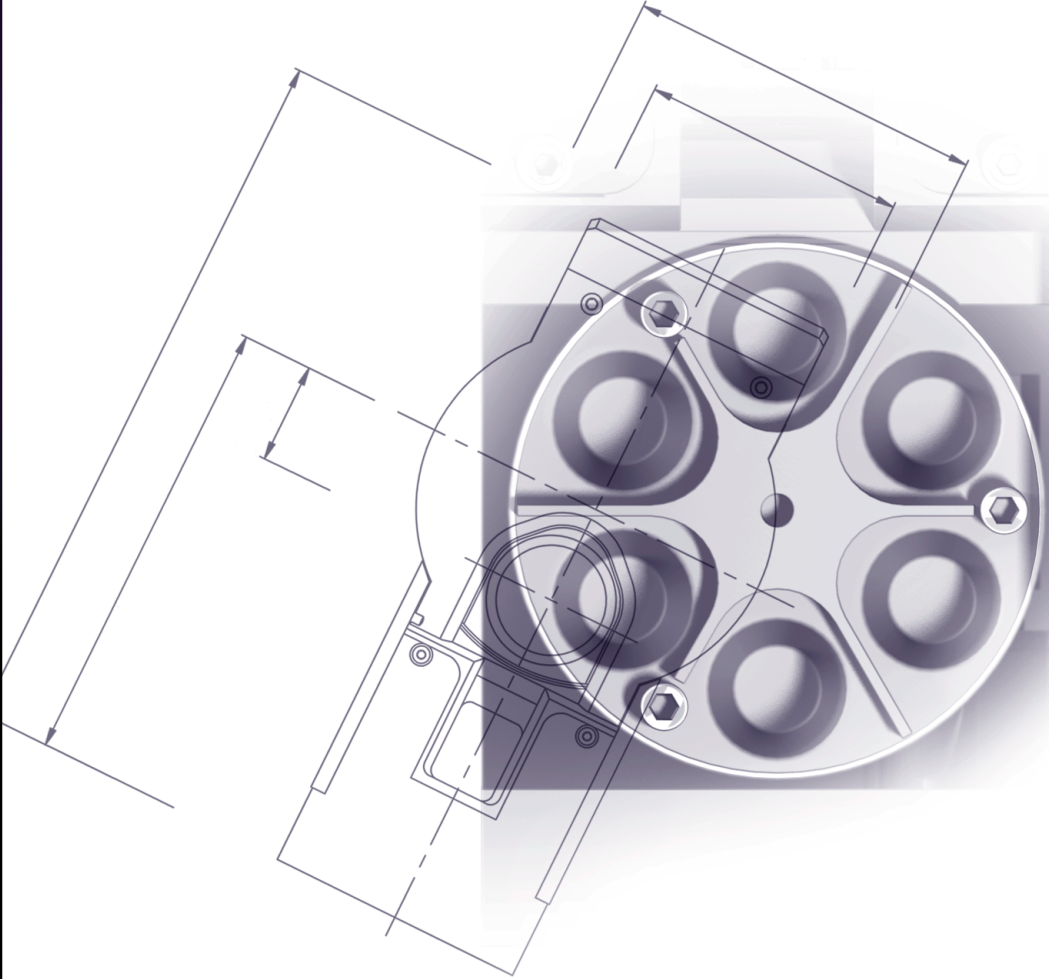


**Multihearth Electron  
Beam Evaporators**



## Multihearth electron beam evaporators

EV M-5 II  
EV M-6  
EV M-8  
EV S-6  
EV S-8

Ferrotec presents its new generation of multihearth evaporators for thin film coating. All sources serve a wide range of optical and microelectronic applications.

The M-series features only static water-vacuum seals which eliminates any risk of water leakage into the vacuum system due to failed rotary seals.

The S-series features a unique in-vacuum stepper motor for the hearth rotation. This enables free positioning of the evaporator in the vacuum chamber without limitations due to mechanical gear drives. A low pressure version is available for processes requiring minimized outgassing of components at reduced base pressure. All sources come with built-in drive systems for motorized positioning of the pocket.

## Complementary EB system components

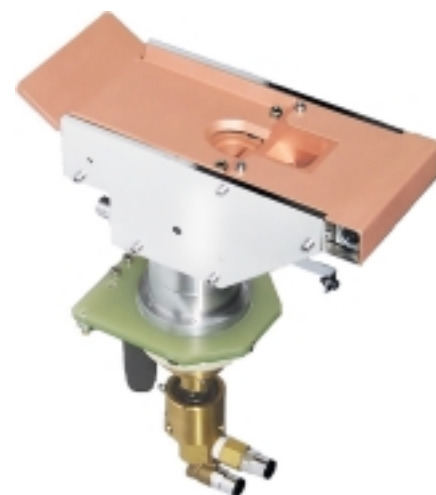
Typ. EB system components	Description	P/N
Carrera 5	5 kW High Voltage Power Supply	1-44 02 00
Carrera 10	10 kW High Voltage Power Supply	1-44 03 00
GENIUS w/GRC+SMC	Evaporation/Sweep/Drive-Controller	1-44 08 14
GENIUS PRO w/GRC+SMC	Controller w/extended sweep functionality	1-44 09 14
FPS 3	Filament power supply	1-44 07 50
FPS 3.2	Filament power supply for simultaneous operation	1-44 07 60
HV feedthrough	2 pin (15 kV, 50 A)/ for Ø 25 mm mounting hole *	1-78 66 00
Magnet current feedthrough	3 pin (100 V/10 A)/ for Ø 25 mm mounting hole *	1-78 86 00
Stepper motor feedthrough	11 pin (100 V/3 A)/ for Ø 25 mm mounting hole *	1-78 88 00
Water service feedthrough	2 x water tube 1/4"OD, 2 x VCO fittings (vac. side)*	1-78 46 00

\* Feedthroughs also available for Ø 32 mm mounting hole



Carrera 10 with Genius controller

The EV M-5 II multihearth electron beam evaporator is an excellent choice for applications requiring high deposition rates and effective material utilization. Typical applications are production coatings or laboratory-scale evaporations with a variety of different materials or with materials that require continuous pocket rotation. The sources offer excellent reliability and repeatability needed in production environment at a competitive price.



## Features

- Small beam spot regardless of position in pocket
- Low inductance x- and y-coils with dynamic defocusing capability
- No dynamic water-vacuum interface
- Long filament lifetime
- Reproducible & quick filament fixture
- Integrated hearth positioning using optical encoder and safety clutch system
- Plug-in connector for magnet leads

## Benefits

- Homogeneous material depletion
- Stable beam sweep at high beam deflection frequencies
- Eliminates water leakage into vacuum system
- Reduced maintenance and down-time
- Enhanced run-to-run repeatability
- Built-in hearth rotation with torque control
- Non-interchangeable connections

# EV M-6 / EV M-8



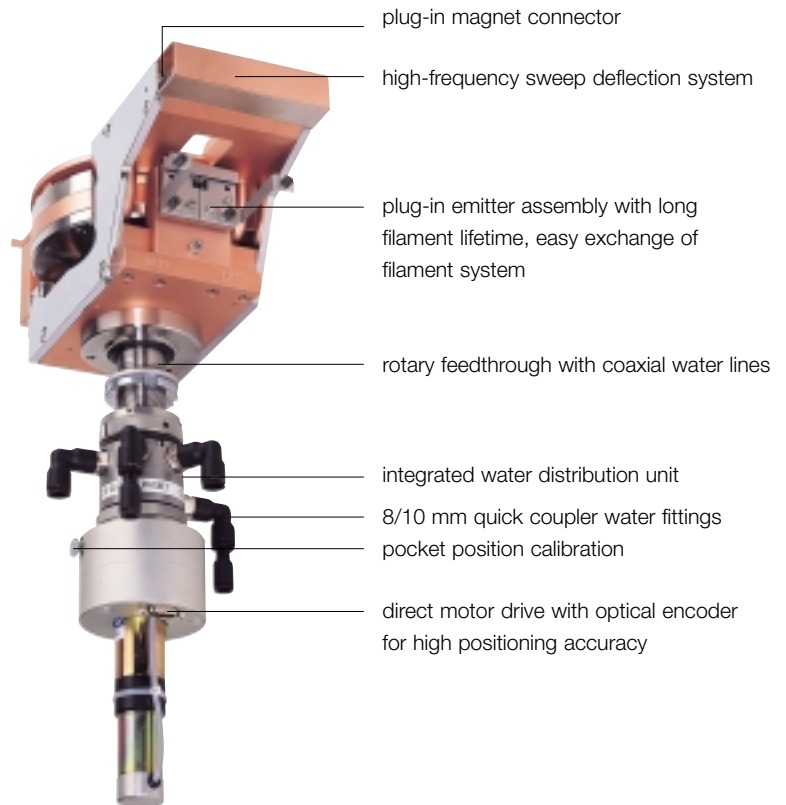
The EV M-6 and EV M-8 multihearth electron beam evaporators are specifically designed for applications requiring high deposition rates and effective material utilization. Typical applications are production coatings or laboratory-scale evaporations with a variety of different materials or with materials that require continuous pocket rotation. The sources offer unique technical features to enhance the reliability and repeatability needed in production environments.

## Features

- Small beam spot regardless of position in pocket
- Low inductance x- and y-coils with dynamic defocusing capability
- No dynamic water-vacuum interface
- Integrated coaxial water feedthrough for hearth & source body cooling
- Long filament lifetime
- Reproducible & quick filament fixture
- Hearth positioning using optical encoder
- Plug-in connector for magnet leads

## Benefits

- Homogeneous material depletion
- Stable beam sweep at high beam deflection frequencies
- Eliminates water leakage into vacuum system
- No additional water feedthrough required
- Reduced maintenance and down-time
- Enhanced run-to-run repeatability
- Built-in hearth rotation with high positioning accuracy
- Non-interchangeable connections

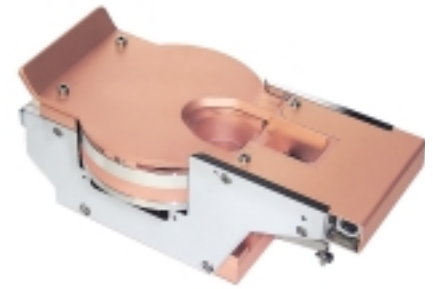


pockets	EV M-6 / EV S-6			EV M-8 / EV S-8		
	volume	power	P/N	volume	power	P/N
1	38 cm <sup>3</sup>	5 kW	1-6109 01	190 cm <sup>3</sup>	10 kW	1-61 19 01
1 ind	65 cm <sup>3</sup>	3 kW	1-6109 13			
1 hp	92 cm <sup>3</sup>	6 kW	1-6109 21			
4	8 cm <sup>3</sup>	5 kW	1-6109 02	35 cm <sup>3</sup>	8 kW	1-61 19 02
4 ind	8 cm <sup>3</sup>	3 kW	1-6109 15	35 cm <sup>3</sup>	5 kW	1-61 19 31
4 hp	8 cm <sup>3</sup>	6 kW	1-6109 22	35 cm <sup>3</sup>	10 kW	1-61 19 22
6	4 cm <sup>3</sup>	4 kW	1-6109 03	20 cm <sup>3</sup>	8 kW	1-61 19 03
6 ind	4 cm <sup>3</sup>	3 kW	1-6109 07	20 cm <sup>3</sup>	5 kW	1-61 19 33
6 hp	4 cm <sup>3</sup>	6 kW	1-6109 23	20 cm <sup>3</sup>	10 kW	1-61 19 23
8	2 cm <sup>3</sup>	2 kW	1-6109 14	12 cm <sup>3</sup>	6 kW	1-61 19 14
12 ind	Ø14 mm	2 kW	1-6109 08			
ring	33 cm <sup>3</sup>	5 kW	1-6109 04	160 cm <sup>3</sup>	10 kW	1-61 19 04
ring ind	51 cm <sup>3</sup>	3 kW	1-6109 05			
disc	Ø 61mm	5 kW	1-6109 06	Ø 116mm	10 kW	1-61 19 09
disc ind	Ø 70mm	3 kW	1-6109 09			
blank	w/o pockets		1-6109 16	w/o pockets		1-61 19 16
blank ind	w/o pockets		1-6109 12	w/o pockets		1-61 19 34
hearth base			1-61 09 10			1-61 19 30

Other hearth configurations are available on request  
ind indirectly cooled hearth; hearth base required

hp high power hearth; welded version  
standard hearth

The EV S-6 and EV S-8 multihearth electron beam evaporators are ideal for applications requiring flexibility in source location. The source offers a unique in-vacuum stepper motor that enables free positioning of the source in 3 dimensions without need for a motion feedthrough. Typical applications are system retrofits, production coatings, laboratory scale evaporation and system design R+D.

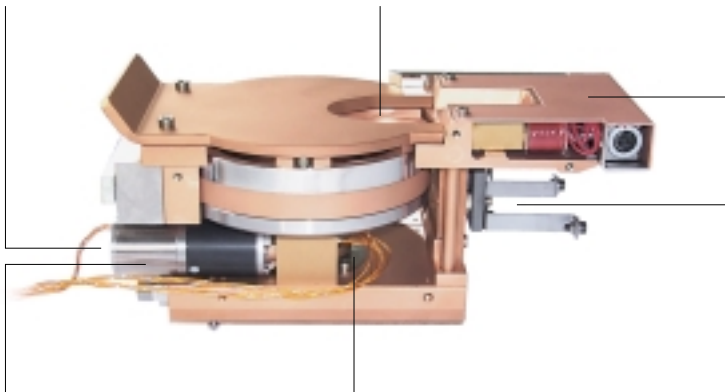


Fully vacuum compatible stepper motor is contained within the source. This eliminates the need for a motion feedthrough so the evaporator can be positioned and repositioned anywhere in the vacuum chamber.

Optional low base pressure design (LP-versions) utilizes a high temperature, bakeable UHV compatible stepper motor for clean process environments

Standard hearth configurations from 4 to 12 pockets with various volumes offer additional flexibility

Magnet deflection assembly creates a focused beam with minimized distortion regardless of its position in the pocket. The high frequency sweep ensures homogeneous material depletion for advanced evaporation processes



A monitor port allows for preventative water leakage tracking on rotary water cooling circuit

Robust precision drive gears with positive position feedback via inductive sensors offer accurate and reliable hearth positioning

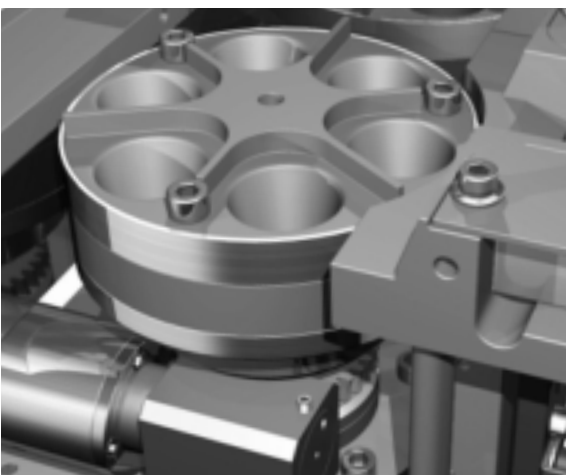
Filament replacement downtime is reduced by unsurpassed filament lifetime and quick and reproducible filament system installation

## Features

- Integrated in-vacuum stepper motor
- Low beam profile distortion & high frequency beam deflection
- Unsurpassed filament lifetime
- Reproducible & quick filament fixture
- Plug-in connector for magnet leads
- Low base pressure design with UHV stepper motor optional

## Benefits

- Flexible positioning of the source without need for motion feedthrough
- Homogeneous material depletion for all evaporants
- Reduced maintenance and down-time
- Enhanced run-to-run repeatability
- Non-interchangeable connections
- Clean process pressure environment



# Specifications



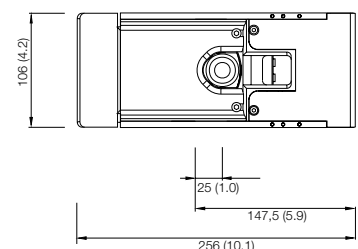
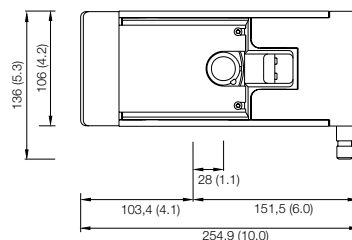
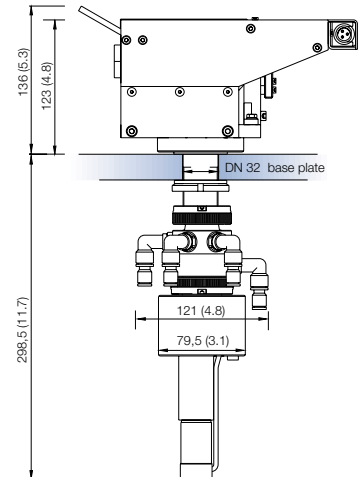
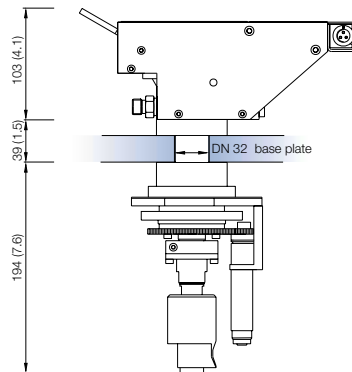
Model	EV M-5 II	EV M-6
Max. power	5 kW	6 kW
Acceleration voltage	4-10 kV	4-10 kV
Max. filament current	50 A @10 VAC	50 A @10 VAC
Primary beam deflection	270° by permanent magnet	270° by permanent magnet
Magnet system (bakeout temp.)	STD (150° C)	STD (150° C)
x-deflection	± 3 A (150 Hz)	± 3 A (150 Hz)
y-deflection	± 3 A (150 Hz)	± 3 A (150 Hz)
Spot size diameter	3 mm	3 mm
Max. evaporation rate <sup>1</sup>	12 000 Å/min	12 000 Å/min
Hearth rotation	integrated DC motor with optical positioning	integrated motor with optical positioning
Motor bakeout temperature	–	–
Typ. operating hours <sup>2</sup>	> 10 000	> 10 000
Min. base pressure	10 <sup>-8</sup> mbar	10 <sup>-8</sup> mbar
Cooling water requirement	6 l/min; 3 bar	6 l/min; 3 bar
Fittings (vac/atm)	2 x VCO / 2 x Ø 6/8 mm PE hose	- / 2 x Ø 8/10 mm PE hose
Mounting requirement	32 mm base plate hole	32 mm base plate hole
Weight	12 kg	12 kg
Part No.	1-63 50 00 (4 x 8 cm <sup>3</sup> pocket) 1-63 70 00 (6 x 4 cm <sup>3</sup> pocket)	1-61 00 00 <sup>3</sup>

<sup>1</sup> For aluminum with source-to-substrate distance of 250 mm with selected hearths at rated power

<sup>2</sup> For max. speed at 100° C

<sup>3</sup> Hearth not included

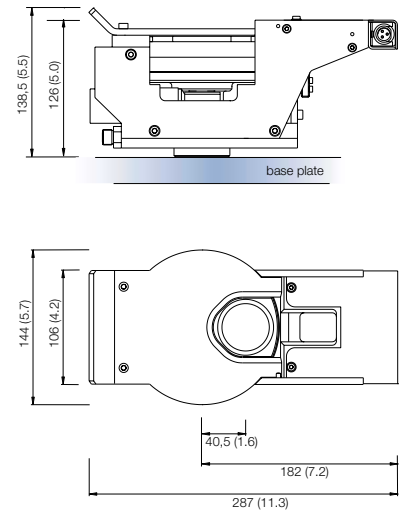
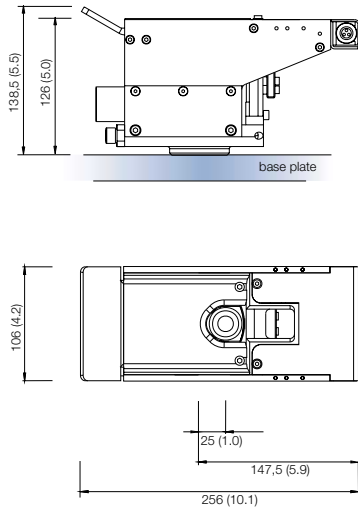
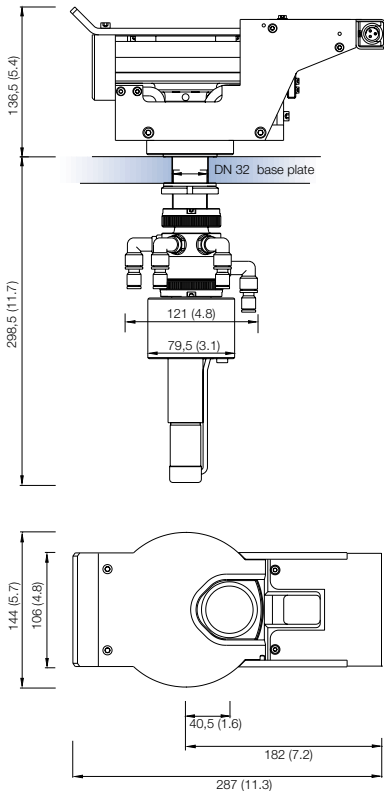
All dimensions in mm (inch)





**Standard**

EV M-8	EV S-6	EV S-8
10 kW	6 kW	10 kW
4-10 kV	4-10 kV	4-10 kV
50 A @10 VAC	50 A @10 VAC	50 A @10 VAC
270° by permanent magnet	270° by permanent magnet	270° by permanent magnet
STD (150° C)	STD (150 °C)	STD (150 °C)
± 3 A (150 Hz)	± 3 A (150 Hz)	± 3 A (150 Hz)
± 3 A (150 Hz)	± 3 A (150 Hz)	± 3 A (150 Hz)
3 mm	3 mm	3 mm
25 000 Å/min	12 000 Å/min	25 000 Å/min
integrated motor with optical positioning	integrated in-vacuum stepper motor	integrated in-vacuum stepper motor
-	HV grade (150°C)	HV grade (150°C)
> 10 000	3 000	3 000
10 <sup>-8</sup> mbar	10 <sup>-7</sup> mbar	10 <sup>-7</sup> mbar
8 l/min; 3 bar	6 l/min; 3 bar	8 l/min; 3 bar
- / 2 x Ø 8/10 mm PE hose	2 x VCO / -	2 x VCO / -
32 mm base plate hole	-	-
15 kg	12 kg	14 kg
1-61 10 00 <sup>3</sup>	1-61 20 00 <sup>3</sup>	1-61 40 00 <sup>3</sup>





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