GRSM midsize drop-in rotatable end-block

Rotatable Sputtering Solutions for Displays and Precision Optics

- Components or Process Ready Modules with Process Tuning Available
23 Years of Products and Technology from Gencoa

Rotatable & Planar Magnetron Sputter Cathodes • Retrofit magnetic packs • Plasma Treaters • Speedflo Reactive Gas Controllers • IM Ion Sources & power supplies • Arc MAX sources & power supplies • Active Anodes and Gas Delivery Bars • OPTIX Gas and Chemical Sensing • S and Se Sensor • PEC Pulsed Effusion Cell • V’DLC - Transparent DLC • IC Nano antimicrobial layer technology • Process implementation & tuning •
# Gencoa Rotatable System GRS end-blocks

<table>
<thead>
<tr>
<th>End Block</th>
<th>Target Diameter</th>
<th>Target Length</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gencoa GRS-S Ultra compact drop-in flange plate mounted</td>
<td>75, 90, 100/105mm</td>
<td>0.15 to 1.2m – target weight and orientation dependant</td>
<td>40 kW</td>
</tr>
<tr>
<td>Gencoa GRS-C Side mounted - cantilever</td>
<td>75, 90, 105, 152-165mm</td>
<td>0.15 to 1.2 m pure cantilever Upto 2.4m with outer end support</td>
<td>&gt;100 kW</td>
</tr>
<tr>
<td>Gencoa GRS-M Drop-in flange plate mounted</td>
<td>75, 90, 105, 152-165mm</td>
<td>≤ 1.8 m vertical (up) ≤ 2.5 m horizontal with end support</td>
<td>&lt;100 kW</td>
</tr>
<tr>
<td>Gencoa GRS-V Top mounted hanging down</td>
<td>75, 100/105, 152-165mm</td>
<td>≤ 2.5 m vertical</td>
<td>&gt;100 kW</td>
</tr>
</tbody>
</table>
Gencoa Rotatable System GRS-M for drop-in mounting

Gencoa GRSM drop-in end-block is a low maintenance mid-sized product for use in vertical or horizontal orientations

- Up to 180Amps of current ~ 100 kW of power, DC/AC, 0-250 kHz
- 5 kV DC voltage capacity, 2.5 kV AC
- Targets up to 2.5m long, out-bound support recommended in all arrangements
- Gencoa patented in-vacuum target rotation
- Fully EMC shielded
- Sealed unit – no debris or water ingress from atmosphere side
- Harting type power connection
- Rotation encoder
- Helium leak rates in the <5 x 10^-8 mbar l/s range
Gencoa Rotatable System GRS-M for drop-in mounting

- Auto shut-off insulated water connections
- Precision location of floating shield with target clamp covering to reduce charge build-up & arcing
- Optional load support brackets – for higher target loads
- Optional water cooled floating shield – additional cooled part to connect to existing shield
- Just 75mm wide to the edge of the target backing tube for extra target length and better process uniformity
Gencoa Rotatable System GRS-M for drop-in mounting
Gencoa Rotatable System GRS-M
Mid Sized Drop-in End Block
Gencoa Rotatable System GRS-M
Easy servicing and maintenance
Gencoa magnet bars with pre-tuned and scanned magnetics fit all types of end-block

Mounted on ‘free-span’ HU high rigidity support tubes

Typical Magnetic Array Process Recommendations

<table>
<thead>
<tr>
<th>Process Type</th>
<th>Magnetic Array</th>
<th>Active Anode</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC high rate metallizing</td>
<td>SSR 550 Gauss</td>
<td>Connected to DC +ve</td>
</tr>
<tr>
<td>DC ceramic ITO</td>
<td>SSR 550 or HSR 1000</td>
<td>Connected to DC +ve</td>
</tr>
<tr>
<td>Reactive oxides dual AC or square wave switching</td>
<td>SSR 550 or SAR 550</td>
<td>1 and per single or dual connected to earth</td>
</tr>
<tr>
<td>Reactive oxides / nitrides single or Duals DC pulse</td>
<td>SSR 550 or SAR 550</td>
<td>1 and per single or dual connected to DC +ve</td>
</tr>
<tr>
<td>Magnetic Materials</td>
<td>HSR 1000 or HAR 1000</td>
<td>Connected to DC +ve</td>
</tr>
</tbody>
</table>

**Codes**

| Balanced 150             | SSR          |
| Balanced Asymmetric 150  | SAR          |
| Unbalanced 150           | PSR          |
| Unbalanced Asymmetric 150| PAR          |
| High Strength 150        | HSR          |
| High Strength Asymmetric 150| HAR     |
| Balanced 75, 90, 100     | GSW          |
| Unbalanced 75, 90, 101   | GPP          |
| High Strength 75, 90, 102| GSH          |
Gencoa magnet bars with pre-tuned and scanned magnetics fit all types of end-block mounted on standard or ‘free-span’ HU support tubes

- Variable magnetic bar designs – 550, 750, 1000 Gauss. Unbalanced designs. Mag bars for 152 & 75 to 105mm OD
- Pre-checked magnets, precise alignment, no water contact – welded enclosure
- Final scan for quality control and uniformity checking
- Low deflection water tube support – no bowing – good field uniformity
- Different companies end-block connection types
Different magnetic and anode designs for rotatable magnetrons based upon needs

One solution does not fit all for optimum production!

<table>
<thead>
<tr>
<th>Rotatable Series</th>
<th>150</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Array Type</td>
<td>HSR</td>
<td>HAR</td>
<td>SSR</td>
</tr>
<tr>
<td>Angle</td>
<td>±21°</td>
<td>±21°</td>
<td>±20°</td>
</tr>
<tr>
<td>Strength</td>
<td>1000G</td>
<td>1000G</td>
<td>540G</td>
</tr>
</tbody>
</table>

**Comparative strength**

**Codes**

- Balanced 150  SSR
- Balanced Asymmetric 150  SAR
- Unbalanced 150  PSR
- Unbalanced Asymmetric 150  PAR
- High Strength 150  HSR
- High Strength Asymmetric 150  HAR
- Balanced 75, 90, 100  GSW
- Unbalanced 75, 90, 101  GPP
- High Strength 75, 90, 102  GSH
GRS different processes by switching the magnetic pack – DC, AC, RF/DC, PECVD available in target diameter from 75 to 160mm.
Uniform erosion of target with minimum re-deposition, Al$_2$O$_3$ process

Erosion to the target ends even in reactive mode
Gencoa have developed and patented a method to provide an effective anode away from the coating flux that can collect all electrons escaping the plasma.

The method effectively combines magnetic trapping with electrostatic attraction of electrons.

- The magnetic field from a single or double magnetron (shown) combined with the magnetic field of the anode to form a closed trap for the electrons to guide them to the anode – electrons do not possess sufficient energy pass the field lines and escape the trap.
- The anode can be at varying potentials but the most convenient and cost effective method is to have the anode at earth potential.
- For example, when used with AC power between two targets, the active anode improves process stability.
Substrate temperature reduction for DC-Pulsed configurations

- **Grounded anode**
  - DC-Pulsed
  - Positive output to anode

- **Floating anode**
  - DC-Pulsed
  - Power on (6kW)
  - 100 kHz pulse frequency
  - Power split to 2 targets
  - Total time: 60 mins

*2x rotatable Ti targets (152mm OD)*

*Al block (256 g)*

---

**Graph:**
- DC-Pulsed and DC
- DC-pulsed +ve to anode
- DC-Pulsed, grounded anode
- DC-Pulsed, floating anode
- Pure DC, grounded anode
- Pure DC, +ve to anode
- Pure DC, floating anode
Gencoa is actively combining technologies and developing ways to enhance thin film devices – Thank you for your attention

Thank You visit www.gencoa.com for more information or speak with your local representative