Switchguard M3A and M23A Electric Point Machines
Emergency Hand Crank or Dual Control

Benefits

- Proven reliability and ruggedness
- Complies with AREMA 12.2.1 and BS581
- Integral switch and lock mechanism
- Minimal projection below sleeper level (M3A is low profile)
- Mount on either side of track—easy conversion with common components
- Electrically-interlocked lock and detection—fast and simple adjustment for each blade
- Gold-plated switch contacts for maximum reliability
- Standard stroke of 152 mm
- Two gear ratios (189:1 and 360:1) to suit supply voltage
- Optional ac immunity

M3A MkII—emergency hand crank
M23A MkII—hand throw lever

Dependable and Robust

The M3A MkII and M23A MkII electric point machines are the dependable and rugged internally-locked point machines for non-trailable applications.

Proven Design and Value

The proven design of these point machines is the result of more than 40 years of development.

Components are shared between the 84M point machine and the M3A and M23A MkII point machines, reducing your costs by minimising spares holding.

Tough and Reliable

The robust cast base, heavy-duty motor and highly durable surface treatment make the M3A MkII and the M23A MkII particularly tough and reliable for years of trouble-free service.
Description

Use the M3A MkII and M23A MkII point machines for mainline or yard operation of single switches, double slip switches, catch points, swing nose crossings and crossovers.

Choose:
- the M3A MkII when you need a compact hand-crankable machine
- the M23A MkII when you need dual control

Both machines have compact overall dimensions, and mount on two sleepers.

Individual padlocked covers protect the motor and circuit controller compartments of both models, and the hand crank entry of the M3A MkII. The lever stands accept standard padlocks.

Indexing and Interlocking Options

M3A MkII—hand cranks can be indexed.

M23A MkII—the selector lever and the hand throw lever can be interlocked so that the mechanism and points are returned to their original position before the power drive can be re-engaged.

Control

For easier maintenance, all control is achieved via external switching (internal contactor models are no longer available).

Motors

Three types are available:
- ac induction motor (capacitor start and run) for longest lifetime
- series-wound split-field motor for dc use
- permanent-magnet motor for ac-immune use

See also:
- Datasheet 2A-8—Series 84M MkIII Point Machine
- Datasheet 2H-1—T21M Point Machine

Ordering

Please discuss your requirements with us prior to ordering.

Please specify:
- motor details (voltage, ac or dc, ac immunity)
- gear ratio—189:1 (standard) or 360:1 (low voltage applications)
- configuration—see page 4
- M3A MkII—indexing of hand crank if required
- the side (left or right; see below and last page) for the selector and hand throw levers

If the side is not specified, the levers are fitted on the right (as shown throughout this datasheet). They can be converted to the other side during installation.

We can also design and supply the operating rodding, either individually or as a packaged kit.
Specifications

### Electrical

<table>
<thead>
<tr>
<th></th>
<th>M3A MkII</th>
<th>M23A MkII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>110–120 Vac</td>
<td>110 Vdc</td>
</tr>
<tr>
<td>Motor type</td>
<td>ac induction</td>
<td>split field</td>
</tr>
<tr>
<td>Current</td>
<td>See performance graphs overleaf</td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical

<table>
<thead>
<tr>
<th></th>
<th>189:1</th>
<th>189:1 or 360:1</th>
<th>360:1</th>
<th>189:1</th>
<th>360:1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory thrust settings</td>
<td>Min 3 kN, slip 5 kN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max thrust adjustment</td>
<td>Slip 7.5 kN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>Throw bar: 152 mm</td>
<td>Standard lock bars and detection rods: 76–152 mm setting range (special bars also available)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeper spacing</td>
<td>508 mm to 660 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight including crate (~50 kg)</td>
<td>375 kg typical</td>
<td>425 kg typical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>See figure below</td>
<td>Outer dimensions of shipping crate: 1880 mm x 1010 mm x 700 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Environmental

- Suitable for all non-freezing environments

### Notes:
- All connections and rod dimensions are the same on point machines style M3A and M23A.
- Dimensions marked * indicate travel adjustment range.
- Dimensions marked ** indicate detection lug fixing within this distance

### Dimensions

M23A MkII shown. Both models are identical except for gearbox height.

- M3A MkII: 262 mm
- M23A MkII: 356 mm

### Diagrams

- M2A plan view
- M2A side view
- M3A point machine gear box
- Gearbox height:
  - M3A MkII: 262 mm
  - M23A MkII: 356 mm

### Detection bar datum

- Adjacent switch open

### Lock bar datum

- Adjacent switch open

### Travel adjustment range

Note: 152 mm

### Factory thrust settings

- Min 3 kN, slip 5 kN

### Max thrust adjustment

- Slip 7.5 kN

### Stroke

- Throw bar: 152 mm

### Sleeper spacing

- 508 mm to 660 mm

### Weight

- M3A MkII: 375 kg typical
- M23A MkII: 425 kg typical

### Dimensions

- Outer dimensions of shipping crate: 1880 mm x 1010 mm x 700 mm

### Electrical Specifications

<table>
<thead>
<tr>
<th></th>
<th>M3A MkII</th>
<th>M23A MkII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>110–120 Vac</td>
<td>110 Vdc</td>
</tr>
<tr>
<td>Motor type</td>
<td>ac induction</td>
<td>split field</td>
</tr>
<tr>
<td>Current</td>
<td>See performance graphs overleaf</td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical Specifications

<table>
<thead>
<tr>
<th></th>
<th>189:1</th>
<th>189:1 or 360:1</th>
<th>360:1</th>
<th>189:1</th>
<th>360:1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gearbox ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factory thrust settings</td>
<td>Min 3 kN, slip 5 kN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max thrust adjustment</td>
<td>Slip 7.5 kN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>Throw bar: 152 mm</td>
<td>Standard lock bars and detection rods: 76–152 mm setting range (special bars also available)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeper spacing</td>
<td>508 mm to 660 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight including crate (~50 kg)</td>
<td>375 kg typical</td>
<td>425 kg typical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>See figure below</td>
<td>Outer dimensions of shipping crate: 1880 mm x 1010 mm x 700 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Environmental Specifications

- Suitable for all non-freezing environments
Typical performance curves

The graphs show the different point machine models’ ability to handle various loads; illustrated is the typical relationship between current draw (A), motoring time (s) and load force (kN). A polynomial trend line was used to get a smooth curve.

Configurations