### Motor Types

**SD 1**

- **Voltage Range:** 12v – 24v, 100/120v, 200/220v and 230/250v.
- **Starting Current:** Approximately 3 times full load.
- **Rotation:** Reversible four leads as standard.
- **Construction:** Shielded ball bearings spring loaded for quiet running.
- **Commutator Type Motors**
  - **Class 'F'** (maximum temperature rise 115°C at a maximum ambient of 40°C).
- **Specifications:** B.S. 5000 part 11. (I.E.C. 72). (CSA C-US if required).

<table>
<thead>
<tr>
<th>SD 1 TV</th>
<th>SD 1</th>
<th>SD 11</th>
<th>SD 12</th>
</tr>
</thead>
</table>

### Commutator Type Motors

- **Variable Speed A.C. – D.C. Series or D.C. Shunt Wound**
- **Enclosures:**
  - Standard – SD 1 Ventilated Internal Fan Cooled (IP 20)
  - SD 11 – SD 12 Drip Proof Internal Fan Cooled (IP 23)
  - Alternative – Totally Enclosed (IP 50) with Terminal Box (IP 54)

<table>
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<tr>
<th>Voltage Range</th>
<th>Output Watts</th>
<th>Input Current (Amps)</th>
<th>Minimum Voltage Available</th>
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</thead>
<tbody>
<tr>
<td>220V A.C.</td>
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<td></td>
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</tr>
<tr>
<td>240V A.C.</td>
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</tbody>
</table>

### Special Features

- **Voltage Range:**
  - Available in a variety of voltages:
    - 12v – 24v
    - 100/120v
    - 200/220v
    - 230/250v

- **Starting Current:**
  - Approximately 3 times full load

- **Rotation:**
  - Reversible four leads as standard

- **Construction:**
  - Shielded ball bearings spring loaded for quiet running

### Gearbox Specifications

- **Single Reduction Gearboxes:**
  - Fitted with ball bearings, alloy gearbox with composite gear, grease lubricated for life and suitable for mounting in any position.

- **In-Line Double Reduction Gearboxes:**
  - Fitted with ball bearings, alloy gearbox with composite gear, grease or oil bath lubricated for life and suitable for mounting in any position.

- **Spur Reduction Gearboxes:**
  - Fitted with ball bearings, alloy gearbox with composite pinion gear and multi-spur type hardened steel gears, oil bath lubricated for life. Suitable for mounting in any position.

- **Connections:**
  - 30cm P.V.C. flexible (Terminal box on request).

- **Insulation:**
  - Class F (maximum temperature rise 115°C at a maximum ambient of 40°C).

- **Specifications:**

### Gearbox Details

- **SD 1 Series Wound**
- **SD 11 Series Wound**
- **SD 12 Series Wound**

- **Optional Extras:**
  - Double ended motor spindles.
  - Double ended gear shafts (not available on in-line units).
  - Non standard shafts (stainless steel, keyways, flats, etc).
  - Terminal box. (not SD 1 T.V).
  - Totally enclosed half hour rating. (SD 1 T.V. reduced length).
  - Holes tapped for spigot mounting.
  - 3 lead reversing (split series) 30% reduction in torque.
  - Radio and T.V. suppression (class B insulation).
  - Thyristor D.C. Controller: Contact Parvalux.
  - Tachogenerator: Page 117.
  - Additional Extras for Geared Units: Non standard catalogue reductions available on request.
  - Bronze Gears: Single and double reduction final gears.
  - Flange Mounting Gearbox Details: Page 114.

### Voltage Ranges

- **220V D.C.**
- **240V D.C.**

### Minimum Voltages

- **5000**
- **4000**
- **3000**
- **2500**
- **2000**

### Input Current

- **FULL LOAD R.P.M.**
- **INPUT CURRENT (AMPS)**
- **MINIMUM VOLTAGE AVAILABLE**

### Shunt Wound Motors

- **L.R. Motors on request. See data column for minimum voltages.**

### Additional Notes

- Shunt wound motor outputs are based on a pure D.C. supply (i.e. from a factor 1) with electronic control. Outputs will be reduced to what degree depends on the form factor (FF) and the matching of motor and controller. We recommend a controller range to give the best performance and brush life.

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**Image:**

- **SD 1 TV**
- **SD 1**
- **SD 11**
- **SD 12**

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**Additional Details:**

- **R.P.M.**
- **WATTS**
- **INPUT CURRENT (AMPS)**
- **MINIMUM VOLTAGE AVAILABLE**
Spigot 'M' can be machined to 34.54/34.49mm dia. concentric with shaft 0.05mm T.I.R. Optional shaft at lead end, 7.93mm dia. x 33mm long.

Approx. weight: SD1 – 1.22 Kg

Dimensions in mm. Scale 1:4

Optional terminal box tapped 20mm conduit or PG 13.5 on request. Shown standard position entry R.H.S. (Not available on SD1 T.V.).

Leads out here 30cm

4 holes can be tapped M4 x 9mm deep.

Plan of base with plate removed.

Approx. weight: SD11 – 2.5 Kg

Dimensions in mm. Scale 1:4

Optional terminal box tapped 20mm conduit or PG 13.5 on request. Shown standard position R.H.S. entry down.

Leads out here 30cm

4 holes can be tapped M5 x 6mm deep.

Plan of base with plate removed.

Approx. weight: SD 12 – 3.57 Kg

Dimensions in mm. Scale 1:4

Optional terminal box tapped 20mm conduit or PG 13.5 on request. Shown standard position R.H.S. entry down.

Leads out here 30cm

4 holes can be tapped M5 x 9.5mm deep.

Plan of base with plate removed.

Spigot 'M' can be machined to 34.54/34.49mm dia. concentric with shaft 0.05mm T.I.R. Optional shaft at lead end, 10mm dia. x 51mm long.
Series Wound Motors

Shown is a typical “torque/speed” characteristic for series wound motors. Series wound motors can be wound for A.C. or D.C. supply. A.C. wound units when operated from a similar D.C. voltage will have approximately 15% increase in output.

Suitable for reversing as standard i.e. 4 leads brought out (two armature and two field). Series motors can be supplied as 3 lead reversing (split field) (the motor runs on one field coil at a time with approximately 30% power loss), change of direction being affected by a single pole switch.

As will be seen from the characteristic the speed varies inversely with the load, consequently series wound motors should not be oversized for their particular application as this will result in the motor running at much higher speeds than required.

It is possible to control the speed of this type of motor by means of a variable resistance transformer in a ratio 5:1 although this can vary depending on the application.

Shunt Wound Motors

Shown is a typical “torque/speed” characteristic for D.C. shunt wound motors. This type of unit has constant speed characteristics, the difference between no load and full load speed being between 10% and 20% of rated speed.

Suitable for reversing as standard i.e. 4 leads brought out (two armature and two fields). The speed can be controlled by means of a variable resistance in series with the armature by a ratio of approximately 6:1, however this can vary considerably depending on the application. Alternatively if an A.C. supply is available a speed range of up to 25:1 can be obtained by means of a D.C. thyristor controller.

IMPORTANT: It must be noted, in mind when reducing the motor speed the armature cooling fan efficiency drops and therefore it is wise to reduce the rating or load of the motor by 30–40% over a speed range of 10:1 and by 50% for a speed range of 25:1.