SEAWARD Electronic Limited guarantees this product to be free from defects in material and workmanship under normal use and service for a period of 1 year. The period of warranty will be effective at the day of delivery.

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Due to a policy of continuous development SEAWARD Electronic Limited reserves the right to alter the equipment specification and description outlined in this publication without prior notice and no part of this publication shall be deemed to be part of any contract for the equipment unless specifically referred to as an inclusion within such contract.
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DECLARATION OF CONFORMITY

As the manufacturer of the apparatus listed, declare under our sole responsibility that the product:

SD 300

To which this declaration relates are in conformity with the relevant clauses of the following standard:

UL 61010-1:2001
BS EN 61010-1:2001
Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements.

BS EN 61326:1998
Electrical equipment for measurement, control and laboratory user-EMC Requirements

Performance: The instrument operates within specification when used under the conditions in the above standards EMC and Safety Standards.

The product identified above conforms to the requirements of Council Directive 89/336/EEC and 73/23 EEC.

Seaward Electronic Ltd is registered under BS EN ISO9001:2000 Certificate No: Q05356.
1.0 Introduction

The SD300 is designed in accordance with international safety standards, to safely discharge stored electrical energy. The SD300 has been designed to conform to modern safe working codes of practice and electrical regulations.

Capacitive effects such as power factor correction or long cable runs on a fixed installation can leave a stored electrical charge on a system after it has been fully isolated from electrical supply.

The SD300 is designed to safely discharge stored capacitive electrical energy left on an isolated system.

The SD300 must only be used to discharge capacitors up to a maximum of 1200uF between any two inputs, on fully isolated single phase or three phase systems or equipment where the maximum stored voltage does not exceed 1000V D.C.

The SD300 is designed to ensure the user is fully isolated from the circuit that is being discharged. The test probes are electrically isolated from each other to avoid sparking during connection. The energy to be discharged is switched by high voltage hermetically sealed relays and safely converted to heat inside the SD300. The internal discharge components are fitted with temperature monitoring to avoid excessive temperature rise.
2.0 User Notes

These operating instructions are intended or the use of adequately trained personnel.

The following symbols are used in these operating instructions and on the SD 300.

⚠️ Warning of electrical danger!
Indicates instructions must be followed to avoid danger to persons.

⚠️ Caution, follow the documentation! This symbol indicates that the operating instructions must be adhered to in order to avoid danger.
3.0 Safety Notes

This SD 300 has been built and tested in accordance with the requirements of:

UL 61010-1: 2001
BS EN 61010-1: 2001

To ensure safe operation of the unit, all notes and warnings in these instructions must be observed at all times.

⚠️ The electrical circuit must be fully isolated before the instrument is connected.

⚠️ The instrument and all test leads and probes must be checked for signs of damage before equipment is operated.

⚠️ This instrument should be used in conjunction with UL approved test leads as specified in section 4.1.

Where safe operation of the instrument is no longer possible it should be immediately shut down and secured to prevent accidental operation.

It must be assumed that safe operation is no longer possible:
- if the instrument or leads show visible signs of damage or
- the instrument does not function or
- after long periods of storage under adverse environmental conditions.

⚠️ Do not operate the SD 300 in an explosive gas or dust environment.
Do not touch the bare tip of the test probes.

⚠️ The SD 300 must not be used to discharge capacitors with a nominal stored voltage greater than 1000VDC.
4.0 Standard Accessories

The SD 300 is supplied with the following items:

1) SD 300  
2) 3 x PP3 alkaline batteries  
3) 1 x MN21 alkaline battery  
4) Instruction book

Unpack the SD300 and remove any transit packing and silica gel bags.

Fit the 3 x PP3 batteries and MN21 alkaline battery following the instructions in section 9.4.

Connect leads and probes to the inputs 1, 2 & 3 according to the colour coding.

The self test facility can now be carried out on the meter and test leads as a whole.

4.1 Test Leads

This equipment must be used in conjunction with test leads with the following characteristics.

- UL recognised construction
- Voltage rating of 1000V
- Fused test probes with crocodile clips
- Fuse type: 1000V, 500mA (F)
Figure 1 SD 300 top panel layout

1. Discharge input 1 (YELLOW)
2. Discharge input 2 (BLUE)
3. Discharge input 3 (RED)
4. A.C. present warning (RED)
5. Discharging LED (YELLOW)
6. Battery OK Indicator (GREEN)
7. Battery Test Button
8. Battery LOW indicator flashing (RED)
9. Discharge Button B
10. Test lead proving terminal (POSITIVE)
11. Test lead proving terminal (NEGATIVE)
12. Battery compartment cover
13. Discharge button A
14. Over temperature indictor (RED)
15. Centre zero charge indication meters
5.0 Checking the SD 300 before use

**Note:** Bracketed numbers in text refer Figure 1.

5.1 Battery check

Press the blue button, **Battery Test (7)** on the SD 300 and observe the green (6) and red (8) battery indicator LEDs. The battery indicators function as follows:

- Green LED (6) only - *The internal batteries are fit for use.*
- Green LED (6) and flashing red LED (8) - *The battery charge is low but there is still sufficient charge to operate the SD 300.*
- Flashing red LED (8) - **DO NOT USE** – *batteries should be replaced.*

5.2 Proving the SD 300 and test leads

Prove the operation of the SD 300 and the supplied test leads by using the inbuilt **Test lead proving terminals (10 & 11)** on the front panel.

a) Plug the red test lead to the **Input 3 (3)** and clip the crocodile clip onto the proving terminal (10).

b) Plug the blue test lead to **Input 2 (2)** and clip the crocodile clip onto the proving terminal (11).

c) Press both green push buttons, **Discharge A (13)** and **Discharge B (9)** at the same time. If the SD 300 is functioning correctly and there is continuity in the test leads the meters (15) below **Input 2 (2)** and **Input 3 (3)** will be right and left full scale deflection.

d) Reverse the polarities of the red and blue test lead crocodile clips at the **Lead Proving Terminals** and the two meters (15) will be deflected to the opposite full scale deflection.
Disconnect the blue test lead from the Input 2 (2) and lead proving terminal (11). Connect the yellow test lead to Input 1 (1) and clip the yellow crocodile clip onto lead proving terminal (11). Repeat steps c) and d) to prove the yellow test lead and meter (15) below Input 1 (1).

If all the above tests are satisfactory the SD 300 and all test leads are ready for use.

Connect the proved yellow, blue and red test leads to the Input Terminals 1 (1), 2 (2) and 3 (3).

⚠️ If any of the proving tests fail, the problem must be rectified before the SD 300 is used.

5.3 Diagnosing a proving test failure.

A failure in one of the proving tests can be as a result of either:
   a) The proving terminal battery is discharged
   b) A blown fuse(s) in the test lead(s)
   c) A broken wire or poor connection in the test lead(s)
   d) A fault in the SD 300

If any of the proving tests fail, the problem should be rectified by a process of elimination of the above possible causes.

   a) Check the proving terminal battery by connecting a voltmeter across the proving terminals (10) and (11). If the terminal voltage the battery is less than 6V it should be replaced by following the instructions in section 8.4
   b) Replace the test probe fuse(s), following the instructions supplied with the test leads and repeat the proving tests.
c) If the test lead(s) have a broken wire or poor or intermittent connection they should be replaced.

d) In the unlikely event of a fault within the SD300, connect the manufacturer or approved service agent for further advice.

6.0 Essential Safety

Ensure that the correct safety notifications have been obtained from and given to all the relevant persons and that the correct permits, safety locks and personal protective equipment, including eye protection and correct voltage grade insulated gauntlets are available.

A correct voltage grade insulated floor covering will also be needed if the work area floor is conductive.

Ensure that the work area is clear of obstructions and that sufficient working space is available. Remove any personal jewellery such as rings, watches and bracelets which could put you at risk.

Ensure equipment to be discharged is electrically isolated in accordance with safe high voltage practice and that no AC/D.C. supply is connected to the equipment. Check using an approved voltage indicator.

Do not, under any circumstances, make any connections to the test lead proving terminals whilst external high voltage circuits are connected to the SD 300 input terminals.
7.0 Performing a safe discharge

7.1 Before attempting a discharge

⚠️ Check batteries as described in section 5.1

⚠️ Prove the operation of the SD300 and test leads as described in section 5.2.

⚠️ Follow the steps in section 6.0 Essential Safety.

7.2 Test lead connections

Connect the test leads as shown below, depending on whether a three wire (figure 2) or two wire (figure 3) discharge is being performed.

![Figure 2 Test lead connections for 3 wire operation](image)
7.3 Discharging

Press both Discharge A (13) and Discharge B (8) together and observe the LED (4) and (5) and the meters (15).

If any of the AC (4) red LED indicators are illuminated the SD 300 has detected the presence of an AC voltage and the discharge operation is automatically inhibited. Release both Discharge A (13) and Discharge B (8) and re-check electrical isolation of the circuits to be discharged.

If the circuit to be discharge is isolated from the AC supply, one or more of the DC LEDs (5) will be illuminated and corresponding meters (15) at left or right of scale. The circuit is now safely discharging.
Keep both **Discharge A (13)** and **Discharge B (8)** buttons pressed until the LEDs (5) are no longer illuminated and the three meters (15) are at the centre of scale, indicating zero volts.  
**Only when this point is reached is the energy storage circuit fully discharged.**

⚠️ Carry out a final check using a suitable Category III voltage indicator to verify that the circuit/equipment is discharged and therefore safe to handle. Perform this test across all three electrical inputs.

### 7.4 Over Temperature protection

The SD 300 has internal temperature monitoring devices and an over temperature trip to protect against excessive temperature rise during a discharge. If the over temperature trip operates the **Over Temperature LED (14)** will illuminate and remain illuminated until the temperature has dropped to a safe level and the thermal trip has automatically reset.

**Note:** *When the Over Temperature LED (14) is illuminated the SD 300 is still capable of detecting voltage on the test probes but Discharge A and Discharge B buttons are inhibited.*

### 7.5 Storage of Discharge Capacitors

To ensure safety from electric shock hazards, shorting links should be fitted between all terminals of discharged capacitors.

⚠️ Approach all stored capacitors without shorting links with caution as there may be stored electrical energy.
8.0 Maintenance

⚠️ Warning: Always ensure that the SD 300 is disconnected from all voltage sources before maintenance work is carried out.

8.1 Preparing to work on the SD 300

Disconnect all test leads from the SD 300 before commencing work.

8.2 Securing the SD 300

Under certain conditions safe operation of the SD 300 can no longer be assumed:

Visible damage of the instrument case.

Recognisable damage to the instrument due to prolonged storage under improper conditions.

Recognisable damage to the instrument due to extraordinary transportation stress.

In these cases, the SD 300 should be immediately secured to prevent any further use.

8.3 Cleaning

Clean the external case of the SD 300 with a clean dry cloth.

Avoid using solvents and abrasive scouring agents to clean the external case of the SD 300.

Check the battery contacts and compartments are free of electrolytic contamination.

Any contamination of the battery contacts or compartment should be cleaned with a dry cloth.
8.4 Battery Replacement

⚠️ Always ensure that the SD 300 is disconnected from all voltage sources before maintenance work is carried out.

The SD 300 contains 3 alkaline cells PP3 cells which provide power for the main unit and one MN21 alkaline cell which provides power for the test lead proving terminals. Removal and replacement procedure for both types of cell is the same:

Disconnect all tests lead from the unit

Release the captive screws in the battery compartment cover.

Remove the battery compartment cover.

Remove the discharged batteries from the compartment.

Insert the new batteries into the battery compartment ensuring that the battery polarity matches the marking on the inside of the battery compartment.

Relocate the battery cover over the battery compartment and fasten in position with the battery cover captive screw.

⚠️ Do not dispose of batteries with other solid waste. Used batteries should be disposed of by a qualified recycler or hazardous materials handler.
8.5 Replacing test lead fuses.

The fuse in each of the test probes should be replaced following the instructions supplied with the test leads.

⚠️ Always ensure that the SD300 is disconnected from all voltage sources before maintenance work is carried out.

⚠️ Replacement fuses must be in accordance with the specified type, rating and size.

8.6 Service and Verification.

To maintain the specified performance, the operation of the instrument should be verified recalibrated at regular intervals by either the manufacturer or an authorised Seaward Service Agent. We recommend a service interval of one year.

For help or advice on Service and verification contact:

Service Department  
Seaward Electronic  
Bracken Hill  
South West Industrial Estate  
Peterlee  
Co Durham SR8 2SW  
England

Tel: 0191 5878739 / 0191 5878737  
Email: service@seaward.co.uk
### 8.7 Spare Parts.

Seaward Part No

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Part No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse 1¼ x ¼ 1000V, 0.5A, Type (F)</td>
<td>27B119</td>
</tr>
<tr>
<td>Three wire Test Lead set</td>
<td>44B159</td>
</tr>
</tbody>
</table>

### 9.0 Specifications

- Maximum working voltage: 1000VDC
- Maximum capacitance: 1200V µF (between any inputs)
- Discharge load: 3 x 2.4kohm in STAR configuration
- Operating Temperature: 0°C to 40°C (without moisture condensation)
- Storage Temperature: -25°C to +65°C (relative humidity up to 90%)
- Weight: 3kg
- Dimensions (mm): 340 x 295 x 150
- IP Rating: IP40 (lid open) IP66 (lid closed)
- Proving terminal voltage: 12V nominal
- Batteries: 3 x PP3 alkaline (main unit) 1 x MN21 alkaline (proving source)