



## User Instructions

### Auxiliary ESU Load Resistors for use with BC Biomedical ESU-2000A ESU Analyzer

The Auxiliary Load Resistors extend the input resistance range of the ESU-2000A, which has built-in input loads of 50, 100, 200, 300, 400, & 500 ohms. The Auxiliary Load Resistors may need to be connected either in series or in parallel with the built-in ESU-2000A input loads. **Only trained personnel should make these connections. Improper connections pose a hazard to the operator and to the equipment.**

#### Series Connections (1000, 2000, & 3000 ohms)

1. Install the ESM-1 Switching Module on the ESU-2000A in the "ESU Power Testing" position.
2. Connect the patient plate of the ESU being tested to the Patient Plate jack on the ESU-2000A using a banana lead.
3. Refer to the table below. Connect the 500 Ohm input jack on the ESU-2000A to one end of the auxiliary load resistor. Connect the other end of the auxiliary load resistor to the active electrode of the ESU being tested. Use banana leads for all connections, and use alligator clips as necessary to make secure connections on the auxiliary load resistors. **Be sure that all exposed metal in the current path is safely positioned to avoid shorting and to avoid contact with personnel and equipment.**
4. Perform ESU power testing as desired into the total resistive load selected as per the table below. **Read the 0-1000 mA current range on the ESU-2000A.**
5. Remove power and disconnect all leads.

#### Parallel Connections (10 & 30 ohms)

1. Install the ESM-1 Switching Module on the ESU-2000A in the "ESU Power Testing" position.
2. Connect the patient plate of the ESU being tested to one end of the auxiliary load resistor AND to the patient plate of the ESU being tested.
3. Refer to the table below. Connect the 50 Ohm input jack on the ESU-2000A to the other (unconnected) end of the auxiliary load resistor AND to the active electrode of the ESU being tested. Use banana leads for all connections, and use alligator clips as necessary to make secure connections on the auxiliary load resistors. **Be sure that all exposed metal in the current path is safely positioned to avoid shorting and to avoid contact with personnel and equipment.**
4. Perform ESU power testing as desired into the total resistive load selected as per the table below. **Read the 0-1000 mA current range on the ESU-2000A.**
5. Remove power and disconnect all leads.

| Total Load Resistance (Ohms) | Auxiliary Load Resistor Value (Ohms) | In series or parallel with ESU-2000A? | Connect to this jack on ESU-2000A |
|------------------------------|--------------------------------------|---------------------------------------|-----------------------------------|
| 10                           | 12.5                                 | Parallel                              | 50                                |
| 30                           | 75                                   | Parallel                              | 50                                |
| 1000                         | 500                                  | Series                                | 500                               |
| 2000                         | 1500                                 | Series                                | 500                               |
| 3000                         | 2500                                 | Series                                | 500                               |

#### **Important Note:**

The Auxiliary Load Resistors have wattage ratings that apply when the resistor is connected to a metal heat sink (typically 1/8" thick aluminum.) Both the accuracy of the resistance value and its power dissipating capabilities are derated when operating without a proper heat sink. Therefore, it is recommended that the resistor be mounted on an appropriate metal heat sink when in use. Heat sinks are available from BC Group. The ESU-2000A and the Auxiliary Load Resistors are intended for short-term, intermittent use to allow for convection cooling and heat dissipation between testing sessions.