Novelec 8 Dual 8174 High Voltage Supply

Operating Manual

1. Introduction

This manual provides essential operating instructions for the Novelec 8 Dual 8174 High Voltage Supply. The device features an adjustable output voltage ranging from 0 to 8 kV and an output current range of 40 µA to 400 µA. The unit contains two independent output channels (A and B).

2. Pre-Operation Requirements

Before powering the device, ensure the following:

1. Apply a –0.9 V ECL enable signal to the Remote Input (Fig. 1, No. 1) of the channel. Voltage output from the channel will be not be available ~~suppressed~~ without this signal.

2. Connect the load to the high-voltage output terminal (Fig. 1, No. 2) of the selected channel.

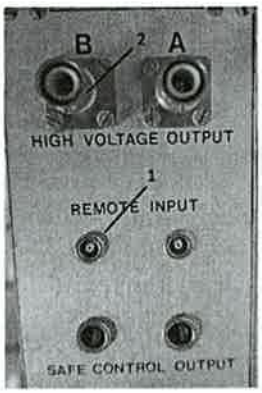

Figure 1: Rear panel overview.

3. Power-On Sequence

Upon successful completion of the pre-operation steps, activate device power using the following sequence:

1. Turn the **POWER** switch ON (Fig. 2, No. 1).
2. Turn the **ENABLE** switch ON (Fig. 2, No. 2).
3. Turn both the channel's **POWER** and **STANDBY switches** to ON (Fig. 2, No. 3).

A channel will begin generating high voltage only if the –0.9 V enable signal is present and the voltage control is set to a non-zero value.

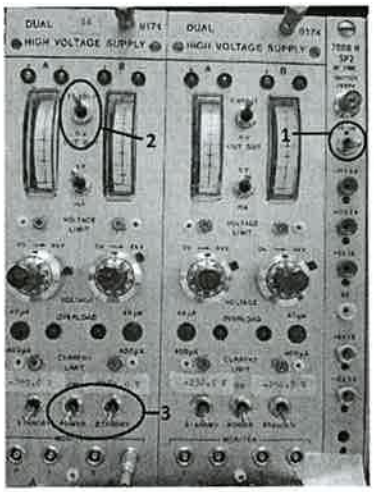

Figure 2: Front panel Power-On sequence.

4. Control and Monitoring

- **Voltage Adjustment:** The rotary control knob (Figure 3, No. 1) sets the output voltage. The 0–10 knob scale corresponds to 0–8 kV.
- **Analog Display:** The analog display (Figure 3, No. 2) indicates either 0–8 kV or 0–0.4 mA, depending on the position of the selector switch (Figure 3, No. 3).
- **Monitor Outputs:**
  - Voltage Monitor (Fig. 3, No. 4) provides 1 V per 1 kV.
  - Current Monitor (Fig. 3, No. 5) provides 1 V per 0.1 mA.

The monitor output could be connected to a multimeter for measurements.

Figure 3: Voltage and current control.

5. Limit Adjustments

These adjustments establish the maximum output voltage and define a current threshold to initiate overload protection:

- **Maximum Voltage Limit:** Adjust the screw (Figure 4, No. 1) using a flat-head screwdriver. Clockwise rotation increases the voltage limit.
- **Maximum Current Limit:** Adjust the screw (Figure 4, No. 2) to set the current limit between 40 µA and 400 µA. Clockwise rotation increases the limit. Exceeding this limit triggers an overload shutdown.

The current threshold should be adjusted based on the application's maximum current to prevent supplying excessive current to the system.

Figure 4: Limit Adjustment.

6. Voltage–Current Test (10 MΩ Load)

The current threshold should be adjusted based on the application's maximum current to prevent supplying excessive current to the system.

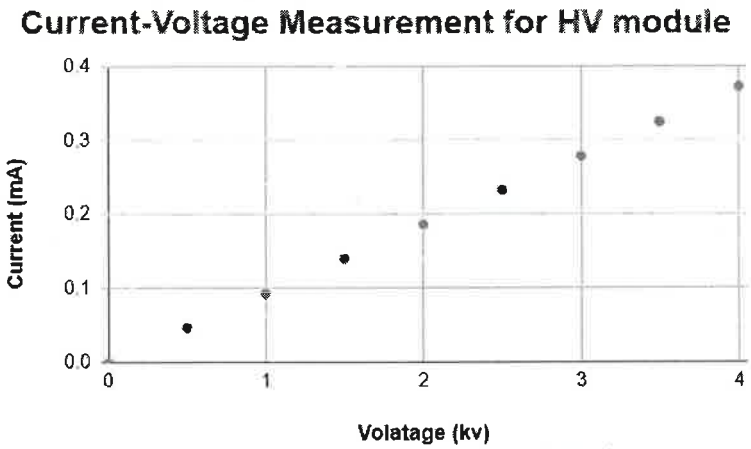

Figure 5: V–I plot for 10 MΩ load.

From the characteristic curve, the calculated total resistance is 10.78 MΩ, which infers an internal resistance for the High Voltage module of 0.78 MΩ.