Installation of Advanced Energy Trek 6300 Series Probes in Vacuum Applications

Important: There are two white wires/shields contained in the cable. Keep track of them. Differentiate, label, and dress both sets of white wires and their corresponding shields.

Using an OHM METER, a technician can differentiate WHITE(1) wire/shield from WHITE(2) wire/shield at the PROBE side of the cable.

Between WHITE(1) wire and WHITE(1) shield: an Ohm Meter will read a diode junction between this wire and its shield. [WHITE(1) wire is cathode and WHITE(1) shield is the anode.]

Between WHITE(2) wire and WHITE(2) shield: an Ohm Meter will read an 'open' between this wire and its shield.

To locate proper connections on the CONNECTOR side, use an ohm meter and the probe connection pin numbers to trace the wires from the cable connector end. Refer to Figure 1 on page 2 for correct pin connections.

The vacuum connector used must be of the high-voltage type due to the potential on the conductors of the cables reaching up to the value of the measured potential. In the case of using a 6300 series probe connected to a Trek Model 344 or 347 Electrostatic Voltmeter, a potential up to ±3500 volts can exist between all conductors, taken as a group, and EARTH GROUND. However, the maximum voltage between any conductor within the cable, and any other conductor within the cable, is limited to less than ±100 volts.

The 6300 series probe may be applied and operated under vacuum conditions up to at least 10^{-6} Torrs. These vacuum applications are achieved by cutting the probe cable at the appropriate position which allows the proper cable length inside the vacuum chamber.

The procedure is as follows:

A) Cut the cable at the appropriate position (which allows the proper cable length inside the vacuum chamber).

B) Separate, dress, and solder the various cable connections for both ends of the cable using the following precautions:

1) The WHITE(1) wire shield is at the bias potential of up to ±10 volts relative to the WHITE(2) wire shield, therefore, care must be taken to ensure that the WHITE(1) wire shield does not come into contact with the WHITE(2) wire shield.

   A separate connector contact must be provided for the WHITE(1) wire shield connection as shown in FIGURE 1.

   Electrical tape or heat-shrink tubing may be used to ensure that electrical separation is achieved and held between the WHITE wire shields and all other connectors.

2) If the shells of the high-voltage connector and its mating connector are of a conductive (metallic) material and these conducting shells are connected to EARTH GROUND due to their contact to the vacuum (metallic) chamber walls, care must be taken to ensure that all conductors of the probe cable have sufficient clearance to these shells to prevent arc over between the cable and the shells.

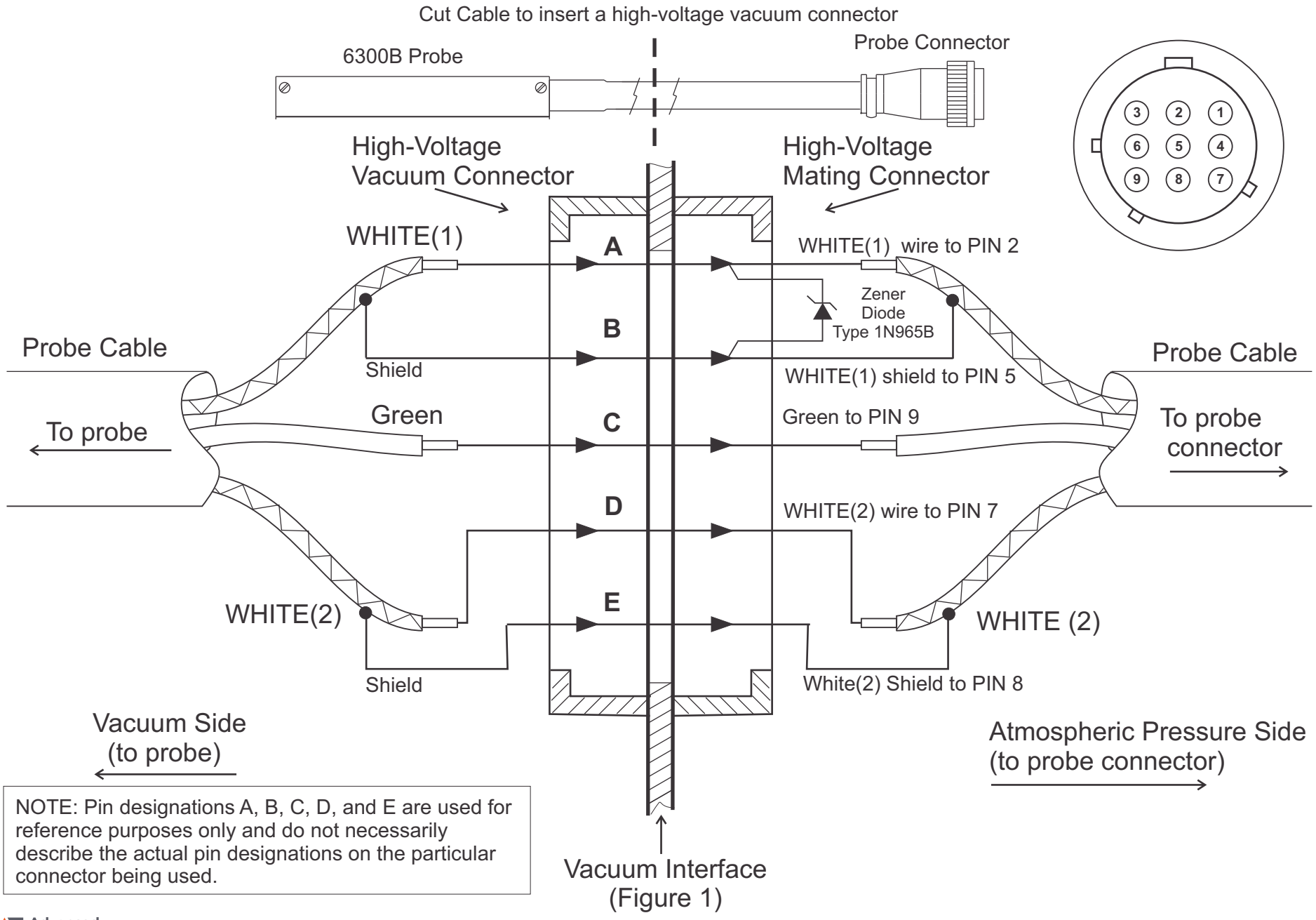
   The sufficient clearance must support a clearance of up to ±3500 volts.

NOTE: Pin designations A, B, C, D, and E are used for reference purposes only and do not necessarily describe the actual pin designations on the particular connector being used.

C) Connect a protective zener diode type 1N965B between pin A and pin B of the high-voltage vacuum connector.

   The zener diode cathode (the terminal normally denoted with a band) is connected to pin A of the vacuum connector, which is also the WHITE(1) wire connection, while the anode of the zener diode is connected to pin B of the vacuum connector, which is also the WHITE(1) wire shield connection.

Advanced Energy Trek 6300 Series Probes in Vacuum Applications Diagram



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