

Installation of Advanced Energy Trek 3453ST and 3455ET Probes in Vacuum Applications

Important: There are three white wires, each with a shield, contained in the probe cable. It is necessary to match and keep track of each white wire. It is critical to match the inner conductor of each white wire designated, on both ends of the cut.

At a predetermined length, the protective silicone tubing material can be carefully stripped exposing the four (4) inner wires.

If one white wire is severed at one time, both segments of the wire can be given the same identifying label. An ohm meter can determine which WHITE wire is cut from the pin designation at the cable connector end. In this way, proper matching can be maintained. The shields of the three white coaxial cables will be all tied together at Pin 4 at the connector end.

Each cut wire must be labeled and dressed. 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 which reach up to the value of the measured potential. In the case of using a 3453ST (side-viewing) or 3455ET (end-viewing) high-temperature probes connected to a Trek Model 341 Electrostatic Voltmeter, a potential up to $\pm 25,000$ volts can be reached 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 ± 120 volts.

The 3453ST or 3455ET high-temperature probes may be applied and operated under vacuum conditions up to at least 10^{-6} Torr.

The procedure is as follows for cable separation:

A) Cut the cable at the appropriate position which allows the required 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) A separate connector contact must be provided for all the WHITE wire shield connections as shown on Page 2 as contact "B".

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 metallic vacuum 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. In the case of the Model 341 Electrostatic Voltmeter, the sufficient clearance must support up to $\pm 25,000$ volts.

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

C) Connect a zener diode (type 1N965B) between the WHITE(1) wire at Pin A and the SHIELD connection at Pin B. Also Connect a zener diode (type 1N965B) between the WHITE(2) wire at Pin C and the SHIELD connection at Pin B.

The zener diodes cathodes (the terminal normally denoted with a band) are connected to Pin A and Pin C of the vacuum connector, while the anodes of the zener diode are both connected to Pin B.

Advanced Energy Trek 3453ST and 3455ET Probes in Vacuum Applications Diagram

See instructions on page 1 for cutting the probe cable to insert a high-voltage vacuum connector (customer supplied connector)

