NATIONAL ELECTROSTATICS CORP.

Instruction Manual No. 2BT058010 For
Operation and Service of

CORONA PROBE MODEL 5801

3/6/02
MJS

P.O. Box 620310, Middleton, WI 53562-0310, Phone: 608-8317-7600, FAX: 608-831-9591, E-Mail: nec@pelletron.com

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I. DESCRIPTION

Corona probes, NEC Part Number 2BA058010 (24VDC) and 2BA058011 (110 VAC), are electromechanical devices designed to control accelerator voltage by acting as a terminal voltage shunt regulator element in a terminal potential stabilizer system.

Terminal voltage is determined by the balance between charging currents(s) and load currents (beam current, accelerating tube grading current and corona probe current). Terminal voltage is regulated by increasing or decreasing the corona probe current. The corona probe is connected to the plate of a high voltage vacuum tube (6BK4 triode typically). The triode acts as a variable resistor in series with the probe and controls the probe current by changing the probe voltage. The triode resistance is in turn controlled by the tube grid to cathode voltage. Increasing the grid voltage (less negative with respect to the cathode) lowers the tube resistance, and decreasing the grid voltage (more negative with respect to the cathode) raises the tube resistance.

The corona triode operates over a relatively limited plate voltage range (30 KVDC maximum). To use the corona probe over the wide range of machine operating voltages, the probe position is adjusted until the triode plate characteristic is within its' active region. The corona probe is moved up to 8" toward the terminal for low voltage operation and away from the terminal for high voltage operation. The unit is mounted to

and works through a 2" or 4" ASA port in the pressure vessel wall directly opposite the terminal shell. A reversible 24 VDC or 110 VAC drive motor with auxiliary end of travel limit switches and a postiion sensing potentiometer control and monitor the axial motion of the unit.

II. INSTALLATION

When installing the corona probe, take the following steps and precautions:

1. Check for any damage due to shipping and/or mishandling in transit.
2. Remove the two half covers to access the four large mounting screws.
3. Remove protective sleeve or cover and take care not to damage needles.
4. After mounting to vessel, connect control and high voltage cables from corona probe controller. If this unit is bought separately, refer to drawing 26-0-302 option 1 to prepare the high voltage cable. Note that enough extra cable must be placed within the covers to feed in and out with probe movement. Note the ground strap connection. Refer to schematic 2HS058310 (24 VDC Motor) or 2HS047230 (VAC Motor) for making connections to “D” pin control cable.
5. Replace covers to minimize dust and dirt entrance and to protect personnel from mechanism.

III. OPERATION

If reduced travel is desired it will be necessary to adjust the micro switches accordingly. Otherwise, the unit is ready to run and operation is covered in the Corona Probe Controller manual.

IV. **MAINTENANCE**

A. Under normal (up to 3 per day) position adjustments, the exposed central shaft should be wiped clear and given a light coat of O-ring grease once every six (6) months.

If use is much greater and/or under dirty/dusty conditions, cleaning should be done more frequently.

B. New corona points must be cut off and adjusted to leave points 1/4" above the face of the ground shield.

V. SPECIFICATIONS

Drive Motor	24 VDC/260 ma - Full Load or 110 VAC/11 Watts
Position Read Potentiometer:	10 kOhms/20 turn
Travel:	8" (205 mm) total at .1"/sec
Shunt Current:	3 Needles/150 μa maximum
Overall Dimensions:	6" X 6" X 18-1/2" Long

VI. **DOCUMENTATION**

Drawings

Corona Probe Assembly
Drawing No. 2-0-5801
Parts List 2BA058010

Schematic - 24 VDC
Motor Probe
Drawing No. 8-5831

Schematic - 110 VAC
Motor Probe
Drawing No. 8-4723

Connector/Cable Diagram
Drawing No. 26-0-302
(Use Option 1)