

## CEMA™ Single MCP and Detector Initial Start-up and Electrical Test Procedure

### NOTES: Read the entire start-up procedure before applying any voltages.

Refer to Diagram 1 - Typical Wiring Diagrams - for each detection mode.

The suggested bias voltage for a Resistive Anode Encoder (RAE) is 300 volts.

### CAUTION:

Do not apply more than 1000V to a 40:1 L/D, 1200V to A 60:1 MCP or 1400 volts to a 80:1 MCP.

When installing flange mounted detectors gradually tighten the bolts in a star pattern (DO NOT exceed 20 foot-pounds per bolt). Failure to do so could cause the fiberoptic to crack.

### RECOMMENDATIONS:

For optimal lifetime, operate the detector at the minimum voltage necessary to obtain a useable signal.

Do not operate the phosphor screen at a higher than recommended potential.

### PROCEDURE

Make all connections to the assembly. Check all electrical connections for possible shorted or open circuits.

Pump down to  $2 \times 10^{-6}$  torr and hold for at least 15 hours.

### VOLTAGE APPLICATION

**Electron/Negative Ion/UV Photon Detection:** (for a metal anode or Resistive Anode Encoder, skip to next section)

#### Phosphor Screen

Ground the input of the assembly ( $V_i$ ). Apply voltage to the phosphor screen ( $V_a$ ) in +250V, 1 minute increments. Stop at +1.0 kV.

Apply voltage to the output of the assembly ( $V_o$ ) in +100V, 2 minute increments. Stop at +0.5 kV.

Increase the voltage to  $V_a$  in +100V, 5 minute increments to +3.0 kV. Wait 5 minutes.

Increase the voltage to  $V_a$  in +100V, 10 minute increments to +3.5 kV. Wait 5 minutes.

Simultaneously increase the voltage to  $V_a$  and  $V_o$  in +100V, 10 minute increments to +3.8 kV at  $V_a$  and +0.8 kV at  $V_o$ .

**For screens requiring a 5.0 kV potential** - Increase the voltage to  $V_a$  in +100V, 10 minute increments to +4.8 kV. Wait 10 minutes.

**For screens requiring a 5.0 kV potential** - Increase the voltage to  $V_a$  in +50V, 10 minute increments to +5.8 kV. Wait 10 minutes.

Simultaneously increase the voltage to  $V_a$  and  $V_o$  in +50V, 10 minute increments to +1.0 kV at  $V_o$ .

When through using the detector, turn off the voltage to  $V_a$ . When the voltage drops below +1.0 kV, turn off the voltage to  $V_o$ .

#### Metal Anode/Resistive Anode Encoder

Ground the input of the assembly ( $V_i$ ). Apply the specified anode bias to  $V_a$ .

Increase the voltage to both  $V_a$  and  $V_o$  in +100V, 2 minute increments by +0.5 kV at  $V_a$  and to +0.5 kV at  $V_o$ . Wait 5 minutes.

Increase the voltage at  $V_o$  and  $V_a$  in +100V, 5 minute increments to +0.8 kV at  $V_o$ . Wait 10 minutes.

Increase the voltage at  $V_o$  and  $V_a$  in +50V, 5 minute increments to +1.8 kV at  $V_o$ . Wait 10 minutes.

When through using the detector, turn off the voltages to  $V_o$  and  $V_a$ .

**Positive Ion/UV Photon Detection** (for a metal anode or Resistive Anode Encoder, skip to next section).

**Phosphor Screen**

Ground the output of the assembly ( $V_o$ ). Apply voltage to the phosphor sheen ( $V_a$ ) in +250V, 1 minute increments. Stop at +1.0 kV.

Apply voltage to the input of the assembly ( $V_i$ ) in -100V, 2 minute increments. Stop at -0.5 kV.

Increase the voltage to  $V_a$  in +100V, 2 minute increments to +2.0 kV. Wait 5 minutes.

Increase the voltage to  $V_a$  in +100V, 5 minute increments to +3.0 kV. Wait 5 minutes.

Adjust the voltage to  $V_i$  in -100V, 10 minute increments to -0.8 kV.

**For screens requiring a 5.0 kV potential** - Increase the voltage to  $V_a$  in +100V, 10 minute increments to +4.0 kV. Wait 10 minutes.

**For screens requiring a 5.0 kV potential** - Increase the voltage to  $V_a$  in +50V, 10 minute increments to +5.0 kV. Wait 10 minutes.

Adjust the voltage to  $V_i$  in -50V, 10 minute increments to -1.0 kV.

When through using the detector, turn off the voltages to the  $V_i$  and  $V_a$ .

**Metal Anode/Resistive Anode Encoder**

Ground the output of the assembly ( $V_o$ ). Apply the specified anode bias to  $V_a$ .

Apply voltage to  $V_i$  in -100V, 2 minute increments. Stop at -0.5 kV. Wait 2 minutes.

Adjust the voltage at  $V_i$  in -100V, 5 minute increments to -0.8 kV. Wait 5 minutes.

Adjust the voltage at  $V_i$  in -50V, 10 minute increments to -1.0 kV.

When through using the detector, turn off the voltages to  $V_i$  and  $V_a$ .

**TYPICAL WIRING DIAGRAMS**

		Pulse Mode (metal anode)	Imaging Mode (Phosphor screen)
Electron/Negative Ion/UV Photon Detector			
	$V_i$	ground	ground
	$V_o$	1000v	1000v
	$V_a$	1050v to 1500v	4000v to 6000v
Positive Ion/UV Photon Detector			
	$V_i$	-1000v	-1000v
	$V_o$	ground	ground
	$V_a$	50v to 500v	3000v to 5000v