FRASER
Anti-Static Techniques

OPERATING INSTRUCTIONS

7160 and 7160-T5

STATIC GENERATION ELECTRODES

CE

UKAS MANAGEMENT SYSTEMS 001

Fraser static control equipment has been designed to give you many years of productive service. However, the science of static control has unique rules which must be followed to allow the equipment to give a good return on your investment.

Please read the following operating and maintenance instructions carefully.

Contents **Page**

1. Introduction

This manual applies to the 7160 and 7160-T5 Fraser Static Generation Electrodes.

It is essential that you read and understand the complete manual before installing and using this equipment. This is important for safety and for warranty cover.

1.1 Explanation of Symbols

Warning!
This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in serious personal injuries.

Caution!
This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in damage to property.

2. Safety

Fraser Generator Electrodes are intended for use in industrial applications to apply static electricity.

It is very important that the user understands the nature of this equipment. Ensure the following warnings and information contained within this manual are read and understood to prevent injury or damage.

Warnings:

- Only qualified engineers or electricians should install, operate or maintain this equipment.
- The high voltage should be turned OFF at source before carrying out any work on it.
- Do not touch any live parts of the equipment as this could result in an unpleasant electrical shock. Which could be dangerous to a person with a pacemaker or a weak heart.
- The electric field from static charging electrodes can induce a static charge in nearby machine parts - if these parts are not grounded they will be capable of giving an electric shock. Nearby machine parts must be connected to earth.
- Any changes to the equipment without written consent of the manufacturer will nullify the warranty and CE approval.

3. Use

Fraser Static Generation Electrodes are used in industrial processes for applying electrostatic charges. They are designed for installation on machinery.

They are used in conjunction with Fraser Static Generators, which supply the high voltage.

The system consisting of the Static Generator and the Electrode are used for temporary adhesion in many areas of industry.

4. Checking on Delivered Equipment

The equipment leaves our factory in suitable protective packaging. Please check that it is undamaged when it arrives. If there is visible damage contact the Factory or one of our Distributors immediately, before carrying out any installation.

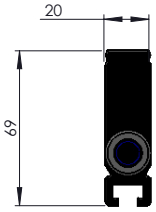
Check that the parts which have been delivered are the same as you have ordered.

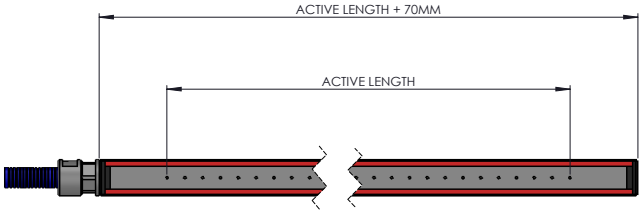
Loose Parts:

Electrode and plastic installation fixings.
Plastic slide to cover/screen emitters, if ordered.
Static Generator, if ordered.

5. General Specification and Dimensions

	7160	7160-T5
Operating Voltage:	To 60 kV.	To 60 kV.
Operating Conditions:	Max 50 °C.	Max 50 °C.
	70 % RH non-condensing.	70 % RH non-condensing.
Material:	PVC body, epoxy resin, FR-ABS endcaps	PVC body, epoxy resin, FR-ABS endcaps
Standard Available Lengths:	From 200 mm to 4000 mm.	From 200 mm to 4000 mm.
Active Length:	Overall length less 70 mm.	Overall length less 70 mm.
Emitters:	Tungsten. 10 mm pitch.	Tungsten. 5 mm pitch.
Resistance between HV and emitters:	170 MOhm.	400 MOhm.
Cable:	2 m unless ordered otherwise.	2 m unless ordered otherwise.
Generator, to use with:	IONFIX Generators only.	IONFIX Generators only.



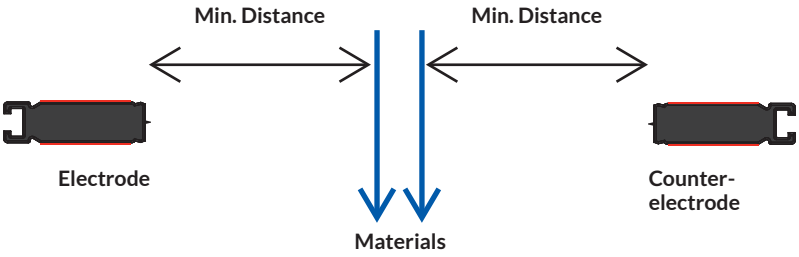


6. Positioning

Operating Distance: Guidelines - minimum 20 mm to object for 30 kV, plus a minimum of 2 mm per extra kV above 30 kV e.g. if operational voltage is 40 kV then minimum distance to object is 40 mm. The best distance is achieved by experiment.

Mounting: The M8 nylon mounting bolts should be used for installation. One M8 bolt is needed every 500 mm to maintain rigidity.
Important: There should be no metal parts within 50 mm of the electrode for 30 kV or within 75 mm for 50 kV.
If this is not followed there is a risk of electrical breakdown or poor performance.
All metal parts within 500 mm of the electrode must be earthed.
Keep cables away from grounded surfaces.
Minimum bend radius 50 mm.

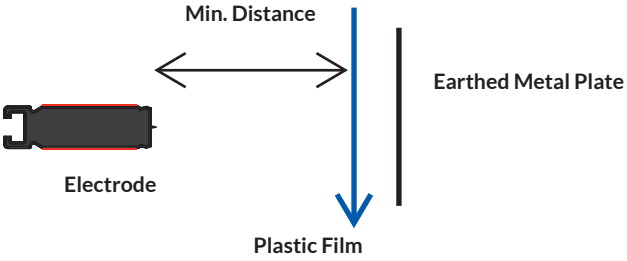
There must always be an electrode and a counter-electrode on the other side of the materials which are to be stuck together electrostatically. The counter-electrode is to allow mirror-image ions of the opposite polarity to be generated. The efficiency of the process depends on the counter-electrode. The normal methods of achieving adhesion between two non-conductive materials, and the options for the counter-electrode, are shown below.



	Electrode	Materials	Counter-Electrode
A)	7160/7160-T5	7160/7160-T5 of opposite polarity	Best adhesion
B)	Ditto	Ionising bar, e.g. 1250-S	Good adhesion
C)	Ditto	Anti-Static Brush, earthed	Good adhesion
D)	Ditto	Earthed metal rod	Moderate adhesion

6. Positioning

Where a non-conductive material is to stick to a conductive material the process is simpler. The conductive material must be earthed but there is no need for a counter-electrode.



In this application, if the plastic film is smaller than the effective length of the electrode, it is important to mask any emitter pins which can 'see' the metal. The photo shows the Emitter Mask supplied by Fraser - part 715003, which clips into the grooves on the 7160 and 7160-T5 bars.

7. Maintenance

The high voltage should be turned **OFF** at source before carrying out any maintenance.

Static generator electrodes should be kept clean - dust and contaminants around the emitters and body will waste energy, reduce performance and lead to a breakdown of insulation and failure of the bar electrode.

Cleaning is the only maintenance required. Dirt around the emitters will reduce efficiency and result in unsatisfactory performance. A soft toothbrush is ideal for cleaning bars. Do not use a wire brush as this could damage the bar. The bar can be washed with soapy water or IPA, but it must be dry on the inside of the bar around the emitters before turning the power on. Alternatively Fraser can supply a cleaning kit (code: 81220) suitable for use on your generator electrodes.

When cleaning around the emitters - take care as the pins are sharp!

8. Health and Safety

The ozone generated by this product is less than 0.1 ppm and within internationally accepted limits. Please note, when handling and cleaning, that the emitter pins are sharp and care is needed.

9. Certification and CE Declaration of Conformity

We declare that this equipment conforms to the following EC Directives:
Low Voltage Directive: 2014/35/EU
EMC Directive: 2014/30/EU
And is entitled to display the CE Mark.

For further instructions and information, please contact the manufacturer.

10. Troubleshooting

Fault	Solution
Sparking - Electrode too close to an earthed surface	• Increase distance. • Cover emitters so that they do not 'see' metal parts. See Emitter Mask on page 9. • Check that energy is not tracking through dirt - clean the electrode.
No Energy	• Check HV Supply from Generator.
Performance not satisfactory	• Check optimal distance between electrode and product - adjust as necessary. • Dirty electrode - clean the electrode. • Check conductivity of material - if paper it must be $>10^{10}$ Ohms per Square. Check using a Fraser Model 740 Surface Resistance Meter. • Material already charged - neutralise it with a Static Eliminator.

For more information about static and to view the full range of our products, please visit **www.fraser-antistatic.com**

FRASER
Anti-Static Techniques

Scotts Business Park, Bampton, Devon, EX16 9DN, UK
T + 44 (0) 1398 331114 F + 44 (0) 1398 331411
E sales@fraser-antistatic.co.uk W www.fraser-antistatic.com