

Application Spotlight:

Earth-Rite® MULTIPOINT II

Grounding multiple components in powder processing operations.

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Powder processing operations can generate vast quantities of electrostatic charge via the movement of powder. The standard method of charging on powder processing operations is due to tribo-electrification, which is basically the contact and separation of the powder with processing equipment, the powder itself or other factors that can cause charging, like surface contaminants. There are numerous types of equipment that can cause the charging of powders. Such equipment includes, but is not limited to those detailed in Table 1.

Regular disassembly for cleaning and maintenance can result in bonding connections being missed or not made correctly when the equipment is reassembled. Vibration and corrosion may also degrade assembly connections so it is imperative to ensure that no parts in the assembly become isolated from a true earth ground reference.

The most effective way of ensuring that equipment used in powder processing operations cannot accumulate static electricity is to provide a dedicated static grounding solution that will monitor the ground connection of components at risk of static charge accumulation and alert personnel to a potential hazard should a component lose its ground connection. This is especially important if the ground connection point to the equipment is not readily visible or easily accessible.

Powder Processing and Handling Equipment	
Pneumatic Conveying (pipes & hoses)	Sieves & Filters
Micronizers	Blenders
Sieve stacks	FIBC / Big Bags
Fluid Bed Dryers	Tumbling Bins
Hoppers	Granulators
Dust Collectors	Totes & Drums

Table 1: Equipment used in powder processing operations.

Static Grounding protection in powder processing operations.

In pharmaceutical operations, equipment like powder conveying systems, micronizers, blenders and sieve stacks all make up multiple component assemblies that can accumulate high levels of electrostatic charge should any of the components be isolated from a true earth ground. Connections made with items like bonding straps can provide an intentional bond between metal components or assembly mating surfaces may provide an inherent bonded connection.



Fig. 1. A blender getting charged with a powder. Note that the bucket discharging the powder should be bonded to the receiving vessel or grounded independently.

**Static grounding solutions:
convention versus flexibility.**

Most grounding solutions provide grounding protection for discrete pieces of equipment at risk of electrostatic charging like road tanker trucks, railcars, IBCs and drums. Powder processing equipment presents more of a challenge as there are many metal parts that can make up larger assemblies that are electrically isolated from each other. It is therefore important to ensure that multiple components that come into contact with charged powders do have a means of being monitored for static grounding protection purposes.

A more specialised static grounding system, like the **Earth-Rite® MULTIPOINT II**, provides the benefits of eight discrete static grounding systems rolled up into a single package. This gives installer's the flexibility of providing monitored static grounding protection for multiple components of powder processing assemblies through a discrete wall mounted monitoring unit with eight ground status indicators for each component being monitored.

In addition, the **Earth-Rite MULTIPOINT II** will continuously check that all components are connected to a reference earth grounding point, thus ensuring that the ground path resistance between the process equipment and the reference ground never exceeds 10 ohms. A monitored ground path resistance of 10 ohms or less is what is recommended in **NFPA 77, "Recommended Practice on Static Electricity"** and **Cenelec CLC/TR 60079-32-1 (2015): Explosive atmospheres - Part 32-1: Electrostatic Hazards - Guidance.**

If the Earth-Rite MULTIPOINT II monitoring unit detects that an assembly component is not grounded, it will send a signal to the controller which, if interlocked with the circuit powering the operation, can halt the process, thereby eliminating the electrostatic charging mechanism and potential charging of un-grounded equipment.

If such an event does occur, the plant's technicians can rapidly identify which connection needs to be investigated. They can do this by referencing the monitoring unit's ground status indicator panel which will indicate which channel needs to be checked. Once the connection to the equipment is re-established the Earth-Rite MULTIPOINT II controller will provide a permissive condition for the process to start again.

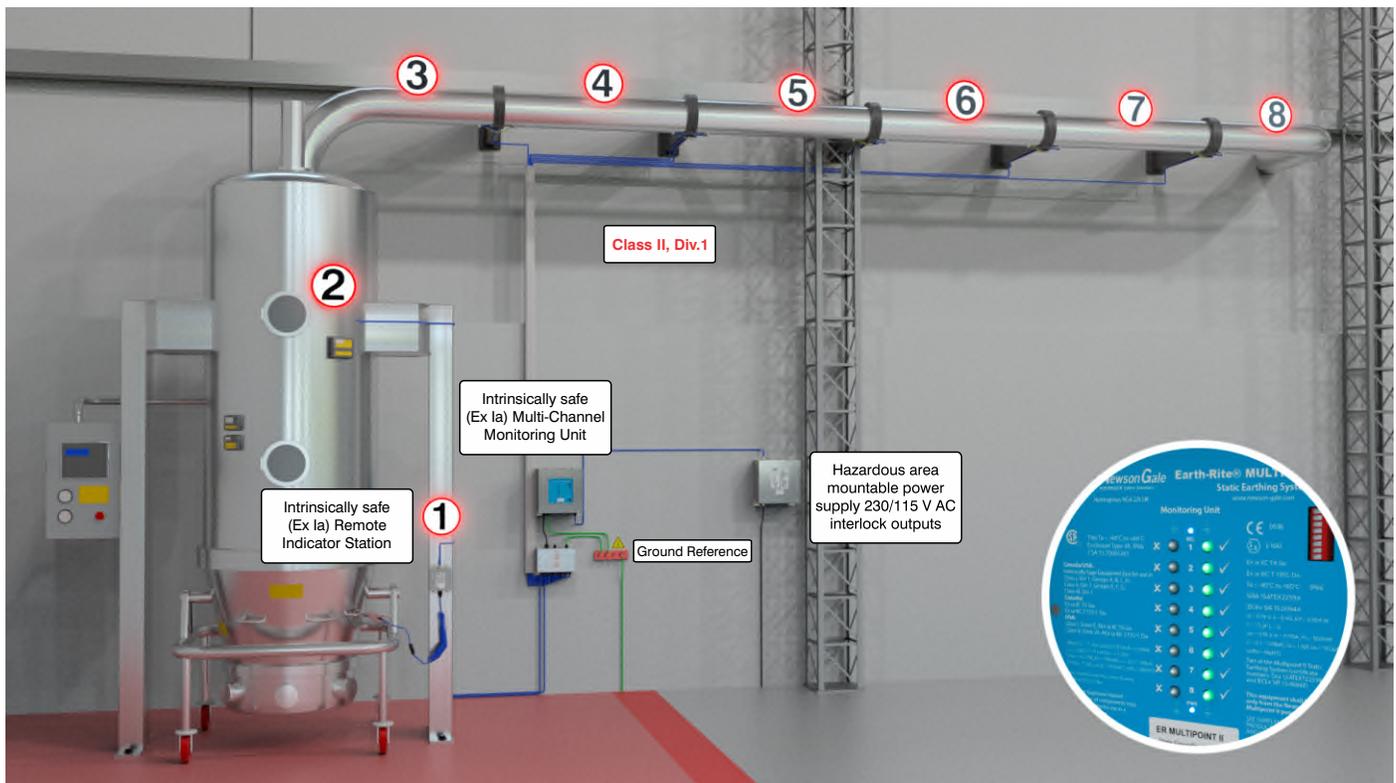
The most common set up, from an interlock option perspective, is to halt the entire process via a single relay output from the Earth-Rite MULTIPOINT II controller so that the isolated equipment can be identified and repaired. Halting the movement of the powder ensures that electrostatic charges are not being generated while a piece of plant equipment does not have grounding protection in place.



Although 8 monitoring channels are provided, not all may be required. For example, if only 5 process items require monitoring, only 5 channels need to be utilised. However, the available 3 channels may be used at some point in the future should any modifications to the process require the addition of more plant equipment.

Additionally, the **Earth-Rite MULTIPOINT II** may be installed to utilise individual channels to monitor multiple items of interconnected equipment, provided the

equipment has a dedicated connection back to an earth ground reference and no fortuitous connections to earth are inherent in the design of the structure being monitored. A useful connection option for this method is a single pole plug and socket connector that enables plant technicians to rapidly make and break monitoring cable connections to the plant equipment being monitored. Specialist advice is available to determine the most appropriate method of installation.



An example of an Earth-Rite MULTIPOINT II installation.

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