

Ground Detector: Description of application and use

3 Phase 3 Wire (Ungrounded) systems are used where it is difficult to establish permanent grounds for equipment. Examples of this are crushers and conveyors in gravel pit or quarry operations and drill rigs in remote areas. These systems are also used in operations that must not be stopped immediately because to do so would endanger personnel or equipment. This may be in pumping or process equipment where a sudden stoppage could cause dangerous pressures or catastrophic failure. Let's take for example a crusher that is driven by a 500 horsepower motor in a mining operation that uses this system. When a first ground occurs in a 3 phase 3 wire ungrounded system the motor will continue to operate with no sign that one phase has been grounded. If however a second phase goes to ground the motor will be severely damaged. It is therefore extremely important that there is indication when a ground occurs in the system. It is in fact required by the National Electric Code.

Erickson Electric manufactures visual ground detectors (Model P for pilot lights) and Visual/Audible ground detectors (Model XVAP).

X indicates a set of dry contacts that can be used for remote monitoring, V and P indicates visual phase indicating pilot lights, A indicated an audible horn or bell.

These ground detectors are available for 120V, 240V, 480V and 600V applications. High voltage applications require that potential transformers are used with the ground detector. They are only for use on 3 phase 3 wire UNGROUNDED systems. They are not ground fault devices. They do not interrupt the power. They are not to be used on Y systems or corner grounded systems.

The ground detector should be installed as close to the source as possible and fuses should be installed ahead of the ground detector. The fuses protect the conductors to the ground detector and allow the ground detector to be disconnected should it need to be removed for repair. When mounted within 5 feet of the source the Model XVAP ground detector can be provided with an internal fuse block. If a Model P ground detector is used or if the Model XVAP ground detector is mounted at a greater distance a customer-supplied fuse block or the Model GDFB fuse box can be used.

The Model GDFB uses fast acting 6 amp fuses such as Type KTK (Bussman) or Type KLK (Littelfuse).

One ground detector is used to monitor the entire system. If it is installed ahead of the main service switch and a ground occurs, opening the main switch will establish if the ground is on the customer side or the utility side. (While the theory is good in the real world the main switch would never be opened to establish the location). If a ground in the system occurs the electrician must establish the location of the ground by isolating sections of the electrical system. This is done by opening each circuit in the distribution panelboard to see if the ground detector indicates the return of a normal situation.

The ground detector monitors the voltage. It cannot cause a power surge. It can be damaged by a power surge, typically a lightning strike.