

July 10, 2015

Thank you for contacting ABB, regarding the ACH550's ground fault protection.

As you know, a ground fault is a serious condition in the wiring between the VFD and its motor because continuous, high fault currents can over-stress the VFD's output insulated gate bipolar transistors (IGBT's). In addition, distinguishing a ground fault from an output line-to-line short circuit provides useful information for diagnosing the source of the problem and addressing it.

As a result of this, a VFD's ground fault protection must be sensitive in or to recognize an abnormally high, instantaneous demand for ground fault current. It also must react quickly in order to protect the VFD from damage. While a sensitive, fast trip can provide a high degree of protection, in some applications it can result in a nuisance trip due to system characteristics that are hard to discern. The difficulty with such a trip is that it is not programmed to automatically reset itself. Therefore, a ground fault trip always requires a manual reset.

When a ground fault trip occurs, the system should be checked to determine if a true ground fault exists. This testing should include, among other things:

- Visually inspecting the wiring from the VFD to the motor to look for proper grounding of the VFD and motor, loose connections, inadvertent grounding of wire strands, nicked insulation and moisture
- Using a high voltage tester, set at not less than 1000V, to look for ground leakage current
- Checking the programming of the VFD, particularly the motor nameplate data and the switching frequency

If none of the above can resolve the problem, the ACH550 has a selectable setting for earth fault. The parameter 3028, EARTH FAULT LVL has three selections of [1] Low (default setting), [2] Medium, [3] High. This selection allows the user to change the detection in order to provide protection in different installation situations with different system characteristics. This feature was added to the ACH550 in February of 2015 on drives with serial numbers starting with 21509xxxxx.

The ACH550 also has parameter 3017, EARTH FAULT, that can be set to [0] DISABLE. While this will disable the VFD's dedicated ground fault detection, the VFD's over current and short circuit protection will still be active.

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