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Technical note 103,

Ground Fault Devices - The truth about Testing

Ground fault circuit protection devices are designed to protect people from electrical shock. They do this by measuring the difference in current between the hot and neutral wires. A difference of 6 mA will cause the device to open the circuit immediately. A ground wire is not necessary, line to ground currents can occur in wet or damp areas, to water pipes or to grounded equipment. GFCI devices will work with 2 wire circuits.

GFCI testers introduce a 7 mA current from line to ground. A ground wire must be present to perform this test or an adapter must be used with a jumper wire to a grounding point such as plumbing. These are valid tests as a small amount of current is being shunted from the line to ground.

All GFCI devices have a test button. This button shunts a small current, 8 mA, from the output line to the input neutral there-by creating a difference current in the sense circuit. This is a valid test and fully tests the GFCI device. A separate tester is not required for a single outlet device, however, extension outlets or a panel mount GFCI breaker should be tested with a GFCI tester such as the AS1000. All outlets should be tested. A working GFCI device should trip immediately (UL specifies less than 6 seconds) when the test button is pushed, if not, the device should be replaced.

As a side note, the test button on an AFCI device does not simulate an arc, but rather controls an input on the microprocessor that causes the device to open. To fully test an AFCI device an arc simulation tester such as the Arc Smart should be used.