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My AFCI is tripping! What do I do?

Eaton has created a basic [troubleshooting guide](#) to help identify issues with the AFCI unit or circuit.

For further assistance contact Eaton's Residential Applications Team:

Phone: 1.800.326.9513

↳ Option 1: Technical Support

↳ Option 1: Arc Fault Circuit Interrupter

↳ Option 2: Ground Fault Circuit Interrupter

Email: resiapps@eaton.com

What is the difference between branch feeder and combination type Arc Fault Circuit Interrupters?

Both branch feeder and combination AFCIs provide conventional thermal and magnetic overcurrent protection. Both also provide high current or "parallel" arcing fault detection and fire mitigation for installed wiring and connected cords. The combination AFCI has the added benefit of enhanced detection of persistent low current or "series" arcing faults which mitigate fire hazards in cords connected to outlets.

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What is new with the 2008 NEC versus the 2005 NEC with respect to AFCI?

The 2008 NEC includes two changes for AFCI. The 2008 NEC expands the coverage of AFCI to all “living” type rooms except for kitchens, basements, bathrooms and crawl spaces. The Section 210.12(B) states that all 120 volt, single phase, 15 and 20 amp branch circuits be installed in all dwelling unit rooms. This includes family rooms, dining rooms, bedrooms, recreation rooms, closets, hallways as well as any similar dwelling room.

Additionally, the 2008 NEC has specified the use of [Combination Type AFCIs](#) whereas the previous code had only required the branch feeder type.

How can I tell if my breaker is a Combination or Branch Feeder AFCI?

- The Eaton combination AFCI has a green label with a yellow button and a label that reads “Combination Type”, visible with the dead front on.
- Square D’s Combination AFCI is differentiated with a white button. No label is visible with the dead front on
- Siemens differentiates their Combination AFCI with a blue button.

How do I determine if I have a grounded or shared neutral?

One of the most common problems that cause the AFCI to trip is grounded and shared neutrals. The Eaton Arc Fault Circuit Interrupter has 30ma of ground fault protection built directly into the breaker itself. If there is a bare ground wire making contact with the neutral conductor, the breaker will trip instantly as soon as a load exceeding 40 watts is applied to the circuit.

The best way to test for a grounded neutral is to use an ohm/continuity tester by turning the breaker to the off position and remove the load neutral from the breaker. Next, take one lead of your tester to the load neutral and the other lead to the neutral/ground bar in the panel. You should read no continuity. If you are getting continuity, go through entire circuit looking for the location where the bare ground is making contact to the neutral conductor. If you are using shared neutral homeruns, you must use a two pole arc fault breaker. You can not use single pole arc faults breakers with shared neutrals.

When I run my vacuum sweeper / paper shredder / treadmill / etc. it trips my AFCI.

Eaton’s AFCI has been designed to work with devices with motors that are within the FCC standard for noise. Even though these devices have been manufactured to the FCC’s standards, after frequent use wear within the motor can create noise which trips the AFCI. To mitigate the noise generated by these devices, you may use a surge plug or surge strip.

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How do I properly install Arc Fault or Ground Fault Circuit Interrupters?

Installation of circuit interrupters should be performed by qualified individuals familiar with local codes and standards. Care should be taken when working with energized panels as they could cause serious injury or death. If you do not feel comfortable doing the job yourself, contact a qualified electrician to perform the work for you.

Every AFCI and GFCI includes a set of instructions. To ensure a trouble free installation, follow these six installation tips.

1. Always be certain that the back of the breaker is seated well into the retaining clip
2. Make sure you press the breaker firmly onto the line side bus bar, making sure it is seated tightly.
3. Always wire the neutral pigtail wire that is connected to the breaker directly to the panel's neutral bar.
4. Wire the load hot and the load neutral directly to the arc fault. The load neutral does not go to the neutral bar as with a standard thermal magnetic breaker installation.
5. After breaker is properly installed, be sure to test it for correct operation by turning the breaker to the "on" position and then push the test button.
6. Your breaker is operating correctly if the breaker trips as soon as you push the test button.

What does the test button do on the AFCI / GFCI device?

All GFCI & AFCI products are equipped with a test button, marked "TEST" in order to check the functionality of the breaker. Pushing the TEST button creates a test fault within the breaker causing the unit to electrically open the circuit.

Underwriters Laboratories (UL) & Canadian Standards Asso. (CSA) agree the best way to check the operation of a GFCI or AFCI is to push the TEST button. Both suggest the GFCI be tested monthly, and require a TEST Reminder on adhesive paper and a TEST Schedule with a minimum of 180 check squares on adhesive paper, be included with each breaker to be attached to the residential panel.

The white wire extending from the breaker is the line side of the electronics package and must be connected to the neutral bar to function properly.

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What are the wiring practices for AFCI?

Wire the circuit as you would any other circuit according to the regulations of the local or state electrical code. Make sure that the circuit is clear from any grounded neutrals and does not share neutrals with any other circuits. If you have a shared or grounded neutral, the AFCI will trip instantly as soon as a load is applied. Standard thermal magnetic breakers will not identify the wiring errors, such as grounded or shared neutrals, in the system. Take care when running wires and making junctions and terminations. The AFCI will let you know if there is a wiring error by tripping.

How do I reset my BR style breaker?

When a BR style breaker trips out it will default to the center trip position. To get the breaker to reset, you must first turn the breaker all the way to the "OFF" position and then all the way back to the "ON" position. You can not just push the handle from the trip position directly to the on position as the breaker will not re-latch. The CH style breaker only has two positions which are the on and the off. To reset a CH breaker, simply push the handle back to the "ON" position.

What is the warranty of my breaker?

BR style breakers have a warranty of 10 years. The CH style breaker has a lifetime warranty. The manufacturer's warranty covers manufacturing defects. This warranty does not cover abuse, misuse, misapplication, etc.

It is recommended to test or cycle the breakers periodically to ensure the mechanics and electrical components of the breaker are operating properly.

Can I use AFCIs / GFCIs with backup or generator power?

Provided the backup power has reached a steady state of 120 volts prior to the switchover, there will be no issues using backup or generator power on circuits with AFCIs or GFCIs.

If the backup power has not reached steady state prior to the switch over, the breaker may see either an undervoltage or overvoltage condition. The AFCI will trip on overvoltage if it sees a spike of 160 volts or more. Conversely, if the voltage is below 70 volts, the electronics within the AFCI / GFCI will not be powered such that they can offer the correct arc fault or ground fault protection. In either case, the thermal magnetic protection (overcurrent / short circuit protection) will continue to be in place.

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AFCI and Ground Fault Protection

There continues to be confusion as to the term “Combination” Arc Fault Circuit Interrupter. “Combination” does not mean there is both arc fault and Class A ground fault protection in the device. Combination refers to parallel as well as low current (series) arc detection.

The Branch-Feeder and the Combination Type Arc Fault Circuit Interrupters both have equipment level ground fault circuit protection (30mA), not the Class A type “people protection” ground fault protection (5mA). Therefore, during the installation of an AFCI, precautions should be taken to ensure wiring anomalies that would normally cause GFI’s to trip (such as grounded neutrals and shared neutrals) should be avoided.

Why is my AFCI warm even when there is no load on the circuit?

The AFCI contains power electronics which are used to monitor the current and voltage. These electronics give off energy in the form of heat even when there is no load applied to the circuit. If you believe the heat generated by the breaker is excessive, contact the Residential Applications group for further consultation.

Can I use a Ground Fault Receptacle with AFCI?

AFCI breakers are compatible with a GF receptacle (GFR). Adding a GFR as the first receptacle in a circuit will ensure AFCI & Class A GFI protection (5mA) from that point on.

Can I use a three wire home run with AFCIs?

To run three wire homeruns which consist of two hot conductors with one shared neutral, you must use a two pole AFCI. Currently, Eaton’s product offering features the branch feeder two pole AFCI which only has parallel arcing detection. The two pole combination AFCI is in development with an anticipated release in the first half of 2009. The use of two pole AFCI breakers can save time and materials by running one three wire homerun to feed two different rooms on the opposite end of the home rather than running two separate homeruns to feed the same two rooms. The 2008 national electric code also requires that each multi-wire branch circuit shall be provided with a means that will simultaneously disconnect all ungrounded conductors.

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Can I use AFCIs in an older home with knob and tube wiring?

Eaton recommends the use AFCI in older homes with knob and tube wiring systems. Although these systems have no grounding conductors in the branch circuits, you can still use AFCI. An AFCI does not need a ground for proper operation. There may be issues energizing these old wiring systems after the AFCI is installed as many older homes have shared neutrals with other circuits which would result in instant tripping as soon as a load is applied. Older homes may also have loose or corroded connections or dry, cracked, and deteriorated insulation. A trip indicates an issue in the wiring. The fix may be as simple as a loose connection or bad receptacle or as complex as rewiring of a complete branch circuit. Contact Eaton's Residential Applications Team for further assistance.

Can I use AFCIs with aluminum wiring?

There are no compatibility issues using AFCIs or GFCIs with aluminum wiring. Eaton suggests using AFCIs in such applications as the difference in thermal expansion rates between the copper terminal and the aluminum wire may cause the connection to become loose over time and become an arcing situation.

What does the handheld tester do?

Eaton, along with other manufacturers, offers a handheld circuit analyzer as a quick and easy method of checking the wiring of a branch circuit. The unit can check AFCI, GFCI and ground fault equipment protection (40mA). The tester can determine if there is an open Hot, Neutral or Ground as well as if Hot has been reversed with the Ground or Neutral. Eaton strongly suggests using the Eaton Circuit Analyzer for Eaton/Cutler Hammer circuit interrupters as not every handheld tester is compatible with every component manufacturer's breakers.

Are dimmers compatible with AFCIs?

AFCIs are compatible with dimmer switches. Using the Branch Feeder Type AFCI with a dimmer, power should be kept below 1000 watts. Using the Combination Type AFCI with a dimmer, you should keep the power below 1500 watts. Loading the breaker past these ratings may result in nuisance tripping. Always be sure that you do not over load the dimmers rating as it could result in excessive heat causing the dimmer to go bad and/or cause the breaker to trip.

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Will the AFCI detect a glowing contact?

Per UL 1699, AFCIs are not required to detect a glowing contact. AFCIs will identify the symptoms of a glowing contact by detecting a parallel arc. However, tripping may occur after initial ignition of nearby materials. Arcing is often evident once the wire insulation has deteriorated due to the heat generated by the glowing contact. Efforts are underway by the industry to release AFCIs which have the functionality to address glowing contacts.