AFDD+- arc fault detection device troubleshooting guide

The technology behind the AFDD+ (Arc Fault Detection Device) will help you to further reduce the risk of fire.

Conventional devices are unable to detect any arc flashes occurring inside your electrical installation.

Thanks to the highly sensitive electronics of the AFDD+, however, detection is now possible.

The device permanently checks your electrical installation to identify the fault patterns that are characteristic of arc flashes.

With this application guide, Eaton seeks to make it easier for you to localize the sources of any such faults.
Troubleshooting guide

Trip cause

The AFDD will only emit the signature trip-flash pattern at the first power-up following a trip event. If the AFDD is switched off and on again, the light sequence will be red, orange and green. If you want the device to display the trip cause again, hold down the test button when switching on the device.

Arc flash due to installation / load fault:
- Dirty switches
- Sluggish switches
- Switches that emit visible and audible sparks
- Cables that have been damaged by crushing
- Broken cables
- Loose pins
- Bulb replacement under voltage
- Old devices that are no longer in use (the switch is already corroded)

Remedy:
- Clean or replace
- Replace
- Replace
- Clean through repeated actuation or replace
- Tighten or replace the pins
- Replace only when no voltage is present
- Old devices that are no longer in use (the switch is already corroded)

Other faults: Remedy:
- Overvoltage
- Overtemperature

FAQ

How can I check if the AFDD is functioning properly?
Pressing the test button will initiate a functional test of the entire AFDD unit, including the electronics.
The light sequence red-orange-green at the first power-up following the test indicates that the device is functioning properly.

What is important to note when connecting the AFDD?
The AFDD has designated connections for the mains side and the load side.
The mains side is to be connected to the lower terminals, and the load side to the upper terminals.

Can I use the AFDD as a root switching device?
For technical reasons, the AFDD cannot be used as a root switching device. Each branch requires a separate AFDD. The 32/40 A types are intended for branches with high loads only (e.g. electrical radiators).

How can the trip cause be attributed to a particular load?
Serial arc: an arc occurring on loads in general (including dimmed loads with nearly 0 % dimming)
Dimmer arc: an arc occurring on dimmed lamps, adjustable hand tools, ...
Parallel arc: an arc between L and N.
Arc on loads with high starting currents, ...

Support

You can reach Eaton’s support team via the following email address:
TechSupportEMEA@eaton.com
The support engineer will need the following information:

General information
- Description of the installation
- How many AFDD units do you have installed?
- How many of them are functioning properly?

AFDD information
- Part no.
- MCB characteristics
- RCCB characteristics

Information about the faulty load
- Manufacturer
- Part no.
- Photos (device, nameplate)
- Supplier
Troubleshooting guide

Trip cause

AFDD has tripped, toggle is in the lower position

The middle color indicator is:

- **White**
  - Tripping due to MCB functionality

- **Blue**
  - Switch the AFDD back on
  - What is the LED color pattern?
    - First red, orange, green, then permanently green
    - Tripping due to RCD functionality

- **Orange flashing, then permanently green**
  - What is the rate of flashing?
    - 3 times repeated, 1 x flashing
      - Tripping due to serial arc
      - Arc-flash tripping
    - 3 times repeated, 2 x flashing
      - Tripping due to dimmed serial arc
    - 3 times repeated, 3 x flashing
      - Tripping due to parallel arc
    - 3 times repeated, 4 x flashing
      - Tripping due to mains overvoltage \( U > 270 \text{ V} \)
    - 3 times repeated, 5 x flashing
      - Tripping due to overtemperature \( T_1 > 115^\circ \text{C} \)
    - 3 times repeated, 6 x flashing
      - AFDD device fault

- **No pattern, the AFDD trips again right away**
  - See “AFDD trips immediately” (see pages 6 to 7)

Any interventions in the electrical installation must be carried out by qualified personnel!
Troubleshooting guide

AFDD trips immediately

Switch off by means of a 2-pole disconnection

Is it possible to switch on the AFDD?

No

Yes

What is the trip cause? (see “Trip cause”)

Does the mains voltage exceed 264 V AC?

Yes

No

Tripping due to mains overvoltage $U > 270 \text{ V} $

Tripping due to arc

Clamp the load side, disconnect all loads or switch them off.

Other trip cause

Does the housing temperature of the AFDD exceed ~80°C?

Yes

No

Tripping due to overtemperature $T_i > 115^\circ \text{C} $

AFDD device fault

AFDD device fault

installation fault (or failure to disconnect/switch off all loads)

See “Finding the faulty load” (see pages 10 to 11)

Any interventions in the electrical installation must be carried out by qualified personnel!
The AFDD trips infrequently

Connect a load greater than 1 kW (e.g. a radiator)

Does the AFDD trip every time?

No

Are the connected devices active?

No

Start the devices

Yes

Contact the support team TechSupportEMEA@eaton.com

Yes

Disconnect all loads or switch them off

See “Finding the faulty load” (see pages 10 to 11)
Troubleshooting guide

Finding the faulty load

All loads have been disconnected or switched off

Connect a load greater than 1 kW (e.g. a radiator)

Is it possible to switch on the AFDD?

Yes

Reconnect all loads one by one and power them up again

No

Installation fault (or failure to disconnect/switch off all loads)

Does the load cause tripping?

No

Load without fault

Yes

Can a load fault be detected?

Yes

Load fault

No

Contact the support team
TechSupportEMEA@eaton.com

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