

# MOD6 Arc Fault Detection Device

Increasing protection around the world

POWER DISTRIBUTION AND PROTECTION



## Features

- Arc Fault protection
- Earth leakage protection
- Over current protection
- Short Circuit protection
- Overvoltage protection
- Compact 2P (36mm) combined width
- Complies IEC62606



## What is the difference between an Arc Fault Detection Device and MCB, RCD or RCBO?

An Arc Fault Detection Device "AFDD" is designed to operate before a fire can initiate by detecting a series or parallel arc.

A typical MCB is designed to detect over current and short circuits, an RCD is designed to detect earth leakage current and a RCBO is designed to detect the elements of both MCB and RCD.

The advantage with the MOD6 AFDD is it connects to MOD6 RCBO so this combination of two devices maximises your protection by offering Arc Fault Detection, Earth leakage protection, Over current protection and Short circuit protection.

### Why use AFDD?

- Reduce the risk of fire as electrical Faults are a leading cause of building fires
- If fire occurs at night reduce the risk to occupants who may be sleeping
- Protect valuable contents on manned or unmanned premises (at night).
- Building fires cost \$\$\$\$ which maybe more attractive for insurance purposes
- Protect downstream equipment for overvoltage's above 275V AC
- Detect ARCs that traditional MCBs, Fuses, RCDs and RCBOs can't see

Arcing faults can occur and may result in electrical fires. Recent events such as the 2017 Grenfell Tower fire with the flammable cladding has pushed for improved protection for certain building types.

The European standard IEC60364-4-42 recommends AFDD for premises with sleeping accommodation, Fire-propagating structure ie high rise buildings, branch circuits with high loads, such as machines, dyers, dishwashers.

AFDD have been mandated in Germany according to standard DIN VDE 0100-420 for buildings: storage of combustible materials (wood working workshops), storage of irreplaceable items (data centres/ laboratories/museums/ art galleries), historic building made from flammable materials, retirement homes, day care centers (bedrooms).

The equivalent in North America AFCI (Arc Fault Circuit Interrupter) has been mandatory since 2002 for residential installations (bedrooms).

## Australian and New Zealand wiring rules AS/NZS3000:2018

CI 2.9.1\* Australian and New Zealand wiring rules state AFDD may be used to protect against arc fault for final sub circuits including fire hazards for the following;

- a. Sleeping accommodation (hostels).
- b. Storage of combustible materials (textile processing plants)
- c. Building with combustible materials (flammable cladding, wooden structures)
- d. Fire propagating structures (high rise buildings).

CI 2.9.7\* for New Zealand mandates for final sub circuits 20A or less;

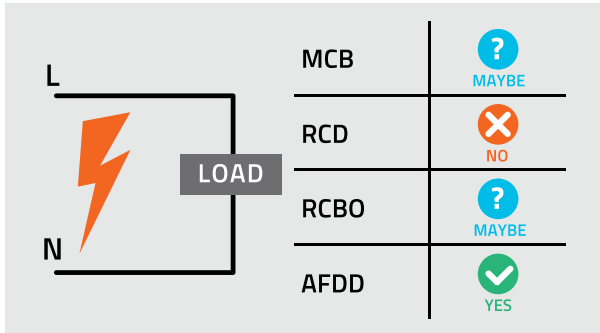
- a. Storage of combustible materials (wood working workshops)
- b. Storage of irreplaceable items (museums/ art galleries)
- c. Historic building made from flammable materials.
- d. School dormitories (sleeping accommodation) socket outlets.

\* refer to AS/NZS3000:2018 for more details



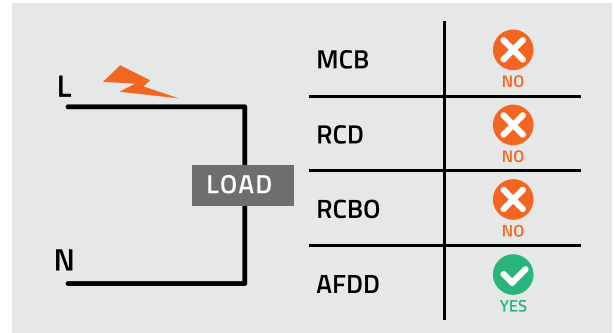
## What are the different types of Arc Faults?

### Parallel arc fault



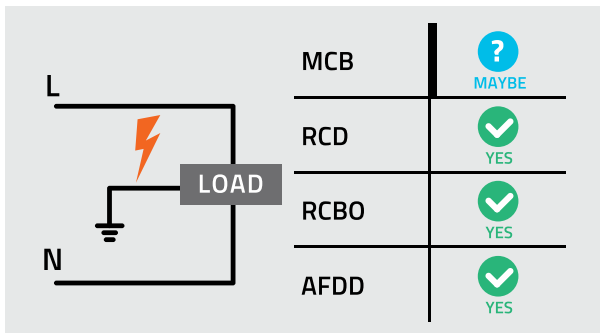
Current is flowing between active conductors in parallel with the load circuit (high current level  $\geq 75A$ )

### Series arc fault



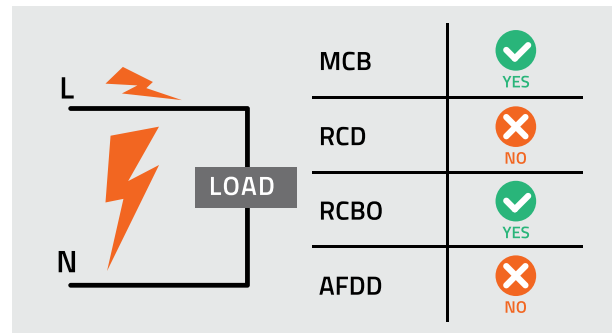
Current is flowing through the load of the final circuit protected (low current level  $\geq 5A$ )

### Earth Fault



Current is flowing from active or neutral to earth

### Over load or short circuit



Excessive current is flowing from active to neutral (series or parallel)

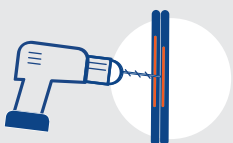
**Miniature circuit breakers (MCBs):** are not able to detect small arcs, as the current level is below what is required to trip the MCB.

**Residual current device (RCDs) or Residual current circuit breaker over current protection (RCBOs):** neither will detect these arcs as the generated current is not going to earth.

**Arc fault detection device (AFDD):** can distinguish between normal loads such as drills, Fluorescent lighting, socket switching, dimmers vacuum cleaners against fire hazard arcing.

## Examples of Arcing faults

### Pierced cable eg. drill or nail



### Aged Cables or UV Damage



### Loose connection



Damaged insulation

Vermin damaged cables

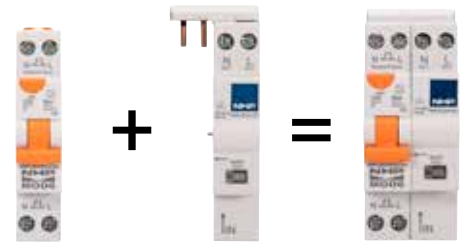
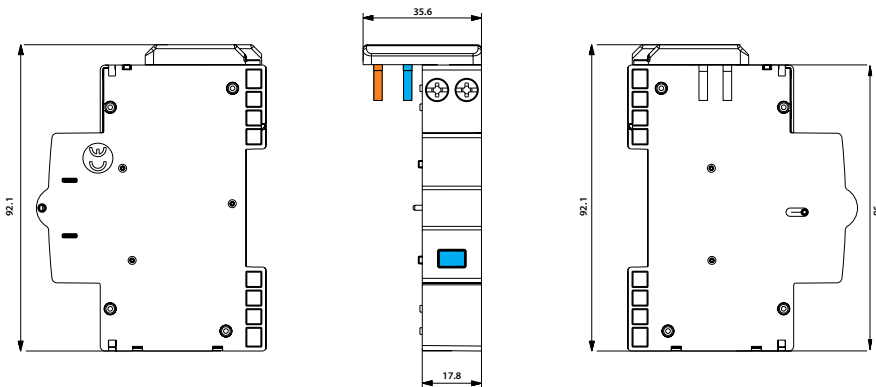


Trapped cables

## Technical Data

Catalogue Number	M6RCBDAFDD
Assembles to RCBO 6A to 32A	M6RCBDxx30CAN
Standard	EN 62606
Maximum rated load current	32A
Rated Frequency	50Hz
Rated voltage (Un)	230V
Operating voltage range	0.85Un to 1.1Un
Overvoltage protection	275V
Minimum operating voltage	0,85 x Un (195,5)
Maximum operating voltage	1,1 x Un (253)
Degree of protection	IP20 According to EN 60529
Mains connection	Bottom
Load connection	Top
Max terminal tightening torque	3Nm
Maximum terminal cross-section	10mm <sup>2</sup>
Test means	Manual test means and periodic automatic test
Rated Short circuit current	6kA
Ambient Operating temperature	-25°C to 40°C
Storage temperature	-40°C to 75°C
Terminal designations	Live and Neutral terminals must be designated and cannot be interchanged
AFDD power connection	AFDD must be connected on the load side of the associated device
AFDD status indication	<ul style="list-style-type: none"> <li>Power Available</li> <li>Series or parallel Arc</li> <li>Overvoltage</li> <li>Defective Unit</li> <li>Continuous Red LED</li> <li>Blinking Yellow LED</li> <li>Blinking Red LED</li> <li>Blinking Red and Yellow</li> </ul>
Resistance to climatic conditions	28 cycles with 25-55°C/90-95% relative humidity acc. to IEC 60068-2
Dimensions	2 modules
Weight	80g

## Diagram



M6RCBDxx30CAN  
RCBO

M6RCBDAFDD  
AFDD

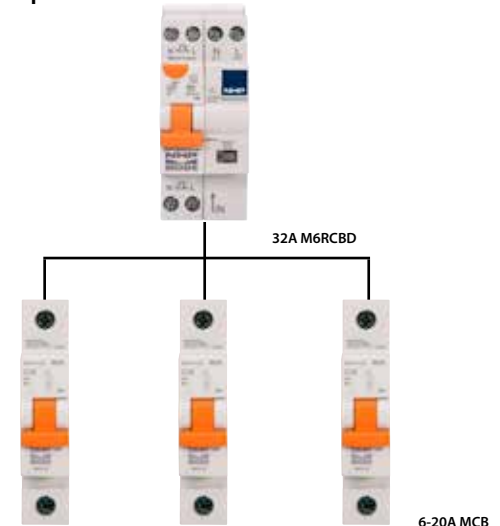
## Two examples both offering protection to 3 final sub circuit

### Example A



Superior level of supply

### Example B



Lower cost, if AFDD operates effects 3 MCBs

AS/NZS3000 2.5.7.2.3 (a) (iii) discrimination is deemed to be achieved if down stream MCB (max 20A) is less than 1.5 times of upstream device (32A).



**NHP Electrical Engineering Products**

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