

## Protection / Arc fault detection

## Acti9 Active Arc fault detection device



Acti9 Active is an arc fault detection device with overload, short circuit and residual current protection, which aims to reduce the risk of electrical fire.

By continuously analyzing a large number of electrical parameters, it detects the appearance of electric arcs that are responsible for starting fires. It isolates the circuit concerned which reduces flame appearance occurrence.

Regulation 421.1.7 of BS 7671: 2018 (IET Wiring Regulations 18th Edition) recommends the use of AFDD to protect against arc fault in AC final circuits. Examples of where AFDDs can be used include:

- in locations with sleeping accommodations (e.g. hotels, nursing homes, bedrooms in homes)
- in locations with risks of fire due to high quantities of flammable materials (e.g. barns, wood-working shops, stores of combustible materials)
- in locations with combustible constructional materials (e.g. wooden buildings)
- in fire propagating structures (e.g. high rise buildings)
- in locations where irreplaceable goods are housed (e.g. museums).

More specifically, the installation of Acti9 Active is highly recommended to protect circuits with highest risk of fire, such as:

- protruding cables (risk of knocks)
- outside cables (greater risk of deterioration)
- unprotected cables in secluded areas (like storage rooms)
- ageing, deteriorating wiring or wiring for which the connection boxes are inaccessible.

Acti9 Active must not be installed on circuits requiring a high level of continuity of service.

Acti9 Active is not compatible with ATEX regulations.

IEC/BS EN 62606  
BS EN IEC 61009-2-1  
BS EN IEC 60947-2  
IEC/BS EN 60898-1

As per the above standards:

- The Acti9 Active provides a protection for final circuits against overcurrents and insulation faults (protection for people against electric shocks).
- In addition to these protections, the Acti9 Active monitors for electric arcs that occur in cables and connections, that may cause a fire. These arcs are the result of localised cable deterioration or loose connections.

- It is used for three types of situations that can result in a fire:
  - parallel arc detection: insulation problems between two live conductors that cause a resistive short-circuit, too weak to be detected by a circuit breaker and with no earth leakage to be detected by a residual current circuit breaker,
  - series arc detection: a damaged conductor or connection will cause a local rise in temperature,
  - overheating of electronic components in loads, when exposed to an overvoltage for several seconds.

- It combines the following functions:
  - circuit protection against overload and short-circuit currents (circuit breaker function),
  - protection for people against electric shocks by direct contacts and indirect contacts (30 mA),
  - protection against fire hazards by detection of abnormal electric arcs,
  - protection against load fire hazards due to slow overvoltages (network overvoltage),
  - fire hazard tripping indication via the front panel indicator,
  - tripping faults diagnosis by LED blinking in front face.

- The Acti9 Active should be installed in the place of the circuit's final protection device.

- Product is reverse feeding: it can be supplied either by the top or the bottom.

### A-SI type

The A-SI type provides increased immunity from electrical interference and polluted or corrosive environments.

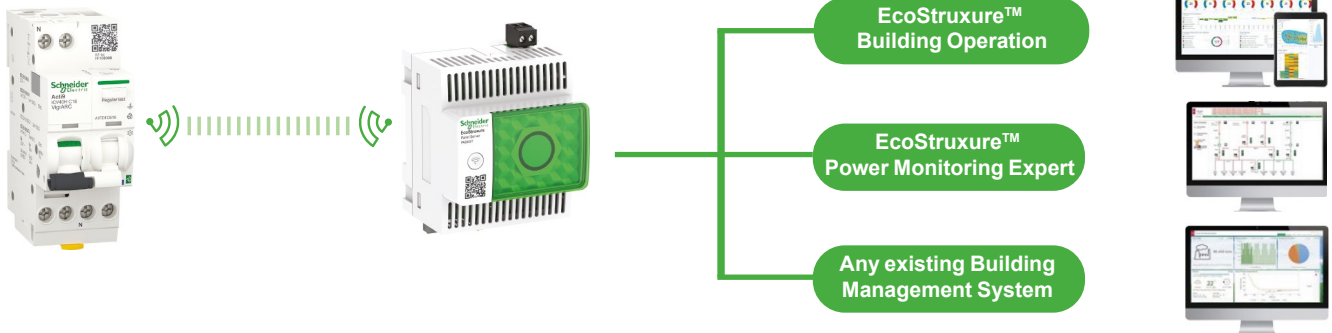
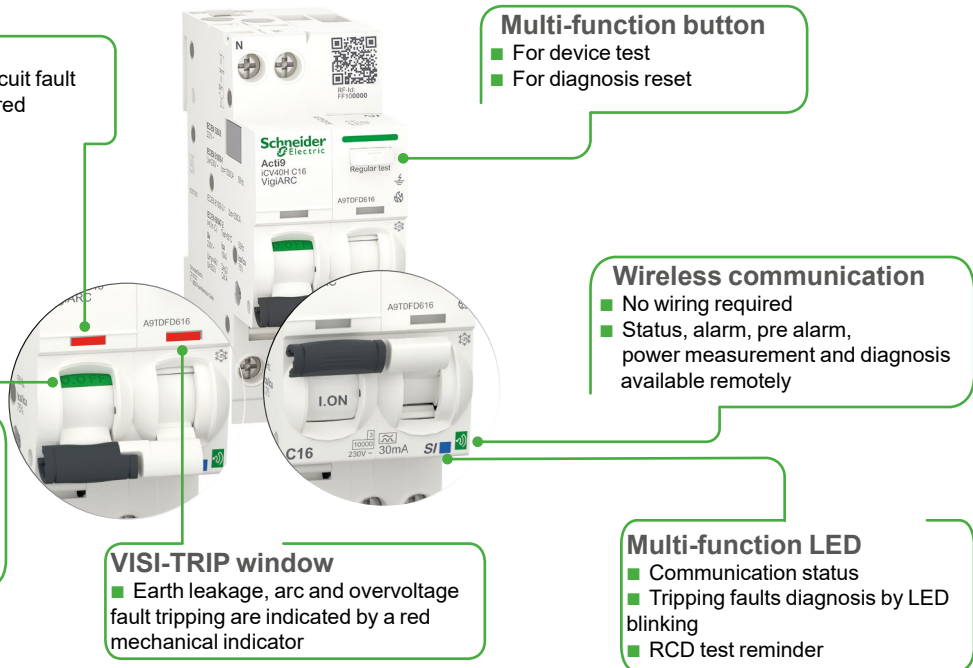
### Wireless-communication device

- Used together with a concentrator or a gateway to collect and process the data, Acti9 Active AFDD provides circuit monitoring and diagnosis down to load level.
- Wireless-communication technology simplifies switchboard wiring and commissioning operations: no wiring is required for the Acti9 Active AFDD to communicate with the concentrator or the gateway.

### Catalog numbers

Acti9 Active, 30 mA, A-SI type			Width in 9 mm modules	
Arc Fault Detection Device to IEC/BS EN 62606 Residual Current Device to BS EN IEC 61009-2-1 and BS EN IEC 60947-2				
1P+N	C curve		4	
	Rating (In)	6 A		A9TDFD606
		10 A		A9TDFD610
		16 A		A9TDFD616
		20 A		A9TDFD620
		25 A		A9TDFD625
		32 A		A9TDFD632
Operating voltage	230 V AC			
Operating frequency	50 Hz			
Comb busbars	A9XPC624, A9X21096			

# Acti9 Active Arc fault detection device



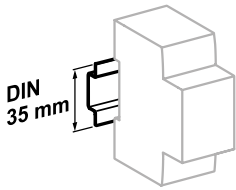
## Acti9 Active "All-in-One" overview of available data:

- Device status (open/close/trip).
- Diagnostics: Reason for tripping (short-circuit, overload, earth leakage fault, serial arc, parallel arc, overvoltage).
- Customizable Pre-alarms (overload, earth leakage fault, overvoltage).
- Measurement: U, I, P, Power Factor, earth leakage %, internal temperature, time of use.
- Protection log (date of 1<sup>st</sup> operation ON, date of last push on test button, number & reasons for tripping).
- RCD test reminder.

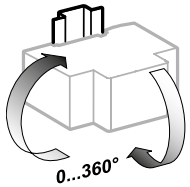
## Associated concentrators / gateways

EcoStruxure Panel Server		
Entry	100-227VACDC	Coming soon
Universal	24VDC	PAS600L
	100-240VACDC	PAS600T
Advanced	24DC	Coming soon
	100-277VACDC	Coming soon

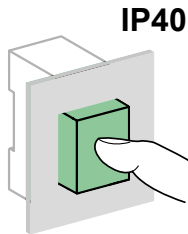
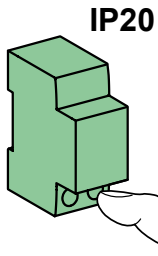
# Acti9 Active Arc fault detection device





Clip on DIN rail 35 mm.



Indifferent position of installation.



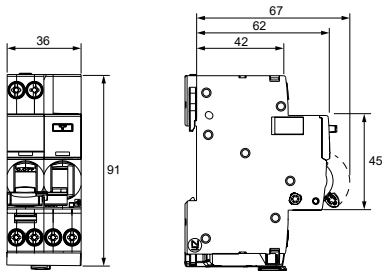
## Technical data

Main characteristics						
Tripping time/arc current value with $U_n = 230\text{ V AC}$ (to IEC/BS EN 62606)	Arc current	2.5 A	5 A	10 A	16 A	40 A
	Max. operating time	1 s	0.5 s	0.25 s	0.15 s	0.12 s
Overvoltage time limits	Voltage (V AC)	255	275	300	350	400
	Max. operating time	No tripping	15 s	5 s	0.75 s	0.20 s
	Min. non-response time		3 s	1 s	0.25 s	0.07 s
Insulation voltage ( $U_i$ )		250 V AC				
Starting current	$I_{st}$	100 mA				
According to BS EN IEC 61009-2-1						
Limitation class		3				
Rated breaking capacity ( $I_{cn}$ )		10,000 A				
Service breaking capacity ( $I_{cs}$ )		100 % $I_{cn}$				
Rated breaking and making capacity on a single pole ( $I_{cn1}$ )		3000 A				
Magnetic tripping	C curve	5 to 10 $I_n$				
8/20 $\mu\text{s}$ impulse withstand without tripping	A-SI type	3 kA				
Behaviour in case of voltage drop		Residual current protection down to 0 V according to BS EN IEC 61009-2-1 § 3.3.8				
Operating temperature		30°C				
According to BS EN IEC 60947-2						
Rated impulse withstand voltage ( $U_{imp}$ )		4 kV				
Breaking capacity ( $I_{cu}$ )		10 kA				
Service breaking capacity ( $I_{cs}$ )	$\leq 25\text{ A}$	75 % $I_{cu}$				
	32 A	50 % $I_{cu}$				
Magnetic tripping	C curve	8 $I_n \pm 20\%$				
Operating temperature		50°C				
Degree of pollution		2				
Radio-frequency communication						
ISM band 2.4 GHz		2.4 GHz to 2.4835 GHz				
Channels	As per IEEE 802.15.4	11 to 26				
Isotropic Radiated Power	Equivalent (EIRP)	0 dBm				
Maximum transmission time		< 5 ms				
Channel occupancy	Messages sent every	5 seconds minimum				
Additional characteristics						
Degree of protection	Unit alone	IP20				
	Unit in a modular enclosure	IP40 Insulation class II				
Endurance (O-C)	Electrical	$\leq 25\text{ A}$	20,000 cycles			
		32 A	10,000 cycles			
Operating temperature	Mechanical	20,000 cycles				
		-25°C to +60°C				
Storage temperature		-40°C to +85°C				
Tropicalization (to IEC/BS EN 62606)		Severity B (to IEC/BS EN 60068-2-30) during 28 days				

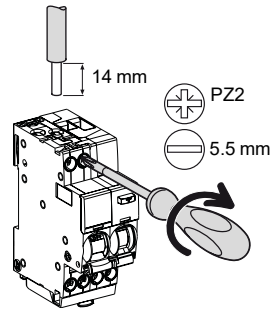
# Acti9 Active Arc fault detection device



## Dimensions (mm)



## Connection



Tightening torque	Copper cables only	
	Rigid	Flexible or with ferrule
2 N.m	1 x 1 to 16 mm <sup>2</sup>	1 x 1 to 10 mm <sup>2</sup>

## Weight (g)

Arc fault detection device	
Type	Acti9 Active
1P+N	220

## Acti9 iARC Arc fault detection switch



Acti9 iARC is an arc fault detection switch which aims to reduce the risk of electrical fire. By continuously analysing a large number of electrical parameters, it detects the appearance of electric arcs that are responsible for starting fires. It isolates the circuit concerned which reduces flame appearance occurrence.

Regulation 421.1.7 of BS 7671: 2018 (IET Wiring Regulations 18th Edition) recommends the use of AFDD to protect against arc fault in AC final circuits. Examples of where AFDDs can be used include:

- in locations with sleeping accommodations (e.g. hotels, nursing homes, bedrooms in homes)
- in locations with risks of fire due to high quantities of flammable materials (e.g. barns, wood-working shops, stores of combustible materials)
- in locations with combustible constructional materials (e.g., wooden buildings)
- in fire propagating structures (e.g. high rise buildings)
- in locations where irreplaceable goods are housed (e.g. museums).

More specifically, the installation of Acti9 iARC is highly recommended to protect circuits with highest risk of fire, such as:

- protruding cables (risk of knocks)
- outside cables (greater risk of deterioration)
- unprotected cables in secluded areas (like storage rooms)
- ageing, deteriorating wiring or wiring for which the connection boxes are inaccessible.

Acti9 iARC must not be installed on circuits requiring a high level of continuity of service.

Acti9 iARC is not compatible with ATEX regulations.


## IEC/BS EN 62606

As per the above standard:

The arc fault detection switch Acti9 iARC monitors electric arcs that occur in cables and connections and may cause a fire. These arcs are the result of localised cable deterioration or loose connections.

- It is used for three types of situations that can result in a fire:
  - parallel arc detection: insulation problems between two live conductors that cause a resistive short-circuit, too weak to be detected by a circuit breaker and with no earth leakage that would be detected by an earth-leakage protection device,
  - series arc detection: a damaged conductor or connection will cause a local rise in temperature,
  - overheating of electronic components in loads, when exposed to an overvoltage for several seconds.
- It combines the following functions:
  - protection against fire hazards by detection of abnormal electric arcs,
  - protection against load fire hazards due to slow overvoltages (network overvoltage),
  - fire hazard tripping indication via the front panel indicator,
  - positive contact indication (green strip),
  - tripping faults diagnosis by LED blinking in front face.
- Coordinated with a MCB or a RCBO, max. 40 A, it protects Phase-Neutral circuits, in full coordination under short-circuit conditions up to a rated breaking capacity of 10,000 A
- Product is reverse feeding: it can be supplied either by the top or the bottom.

## Catalog numbers

Acti9 iARC			
Arc Fault Detection Device to IEC/BS EN 62606			Width in 9 mm modules
1P+N	Rating (In)	40 A	A9TSB3640
			4
Operating voltage	230 V AC		
Operating frequency	50 Hz		

# Acti9 iARC Arc fault detection device (cont.)

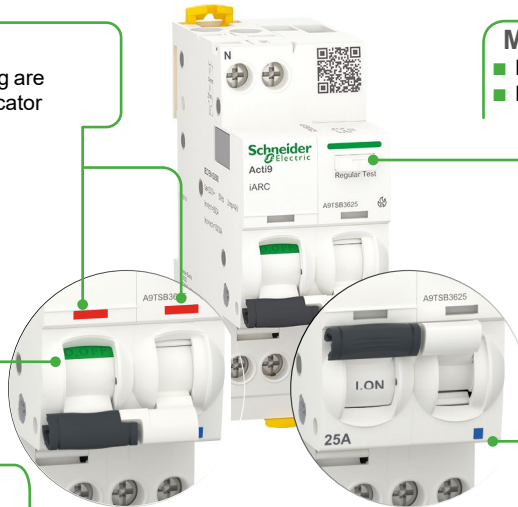


### VISI-TRIP window

- Arc and overvoltage fault tripping are indicated by a red mechanical indicator

### Multi-function button

- For device test
- For diagnosis reset



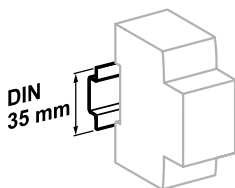
### VISI-SAFE window

#### Positive contact indication

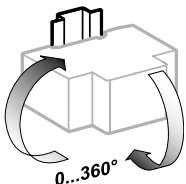
- A green strip on the toggle indicates full opening of all the poles
- Padlocking possible

### Diagnosis LED

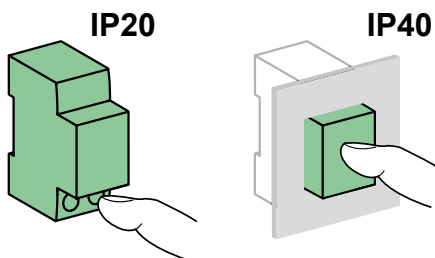
- Tripping faults diagnosis by LED blinking



Clip on DIN rail 35 mm.



Indifferent position of installation.



## Technical data

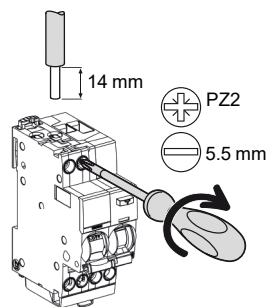
### Main characteristics

Tripping time/arc current value with $U_n = 230 \text{ V AC}$ (to IEC/BS EN 62606)	Arc current	2.5 A	5 A	10 A	16 A	40 A
Max. operating time		1 s	0.5 s	0.25 s	0.15 s	0.12 s
Overvoltage time limits	Voltage (V AC)	255	275	300	350	400
	Max. operating time	No tripping	15 s	5 s	0.75 s	0.20 s
	Min. non-response time	3 s	1 s	0.25 s	0.07 s	
Insulation voltage ( $U_i$ )		250 V AC				
Degree of pollution		2				
Rated impulse withstand voltage ( $U_{imp}$ )		4 kV				
Rated making and breaking capacity ( $I_m$ )		500 A				
One pole rated making and breaking capacity ( $I_{m1}$ )		500 A				
Overvoltage category		III				
Coordinated with an upstream circuit breaker	Max. rating	40 A				
	Curve	B or C				
	Rated breaking capacity	Up to 10,000 A				
<b>Additional characteristics</b>						
Degree of protection	Unit alone	IP20				
	Unit in a modular enclosure	IP40				
Endurance (O-C)	Electrical	25 A	20,000 cycles			
		40 A	10,000 cycles			
	Mechanical	20,000 cycles				
Operating temperature		-25°C to +60°C				
Storage temperature		-40°C to +85°C				
Tropicalization (to IEC/BS EN 62606)		Severity B (to IEC/BS EN 60068-2-30) during 28 days				

# Acti9 iARC Arc fault detection switch

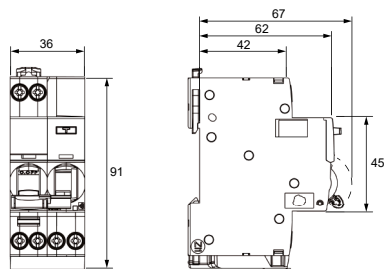


## Connection



Tightening torque	Copper cables only	
	Rigid	Flexible or with ferrule
2 N.m	1 x 1 to 16 mm <sup>2</sup>	1 x 1 to 10 mm <sup>2</sup>

## Dimensions (mm)



## Weight (g)

Arc fault detection device	
Type	Acti9 iARC
1P+N	210