

AUTOMATIC PROTECTION RELAY

Introduction

Automatic relay protection is a device used in power systems to automatically detect and respond abnormal conditions such as overcurrent, overvoltage, ground faults, etc. Alarms to protect electrical systems and equipment from potential hazards and ensure safe operation of electrical systems.

Blue Jay's power distribution safety-related products include Arc flash protection relays, Motor protection relays, WSK series, DH series switchgear temperature and humidity control equipment, etc. Products have miniature intelligence, high integration, high sensitivity and high precision, and has higher anti-electromagnetic interference performance and higher IP protection level. It is suitable for various monitoring sites to ensure electricity safety.

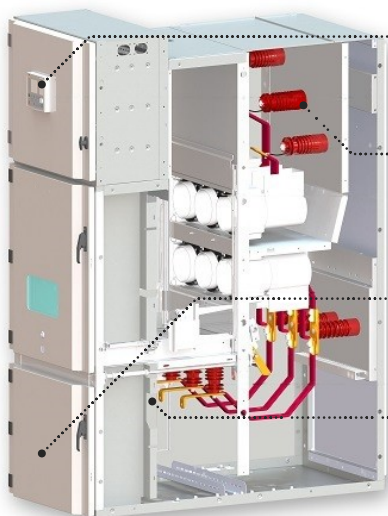


Main Features

- Automatic control, high reliability.
- Ability to record and analyze failure events.
- Modular design, convenient and quick installation and maintenance.
- Quick response: detect and cut off the faulty circuit in time to effectively prevent accidents.
- High-precision measurement and judgment ability, accurately judge the type and location of the fault.
- Versatility: such as overload protection, short circuit protection, ground fault protection, etc.
- 24 hours real-time monitoring, RS485 remote control.

Application

- Industrial automation system.
- Large municipal engineering project.
- UPS system, battery system.
- Real-time monitoring and alarm of power system.
- Substations, power plants, transmission lines, distribution lines.
- Protects motors from overloads, short circuits and motor failures.



Integrated CB control panel

- CB switch status indicate
- CB switching operation
- Integrate PMD and other functions

Thermal Monitoring (SCM-W3000)

- Surface touch or infrared sensor
- Cable terminations
- CB contact fingers
- Busbar joints

Partial Discharge Monitoring (SCM-PD3000)

- TV and ultrasonic sensor
- PD detection
- PD localization

Arc Flash Protective (AFR)

- High precision fiber probe
- Arc detection
- Arc localization
- Fault protection

AFR SERIES ARC PROTECTION RELAY

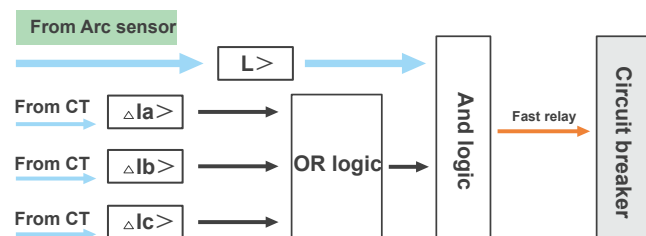
BUSBAR PROTECTION RELAY



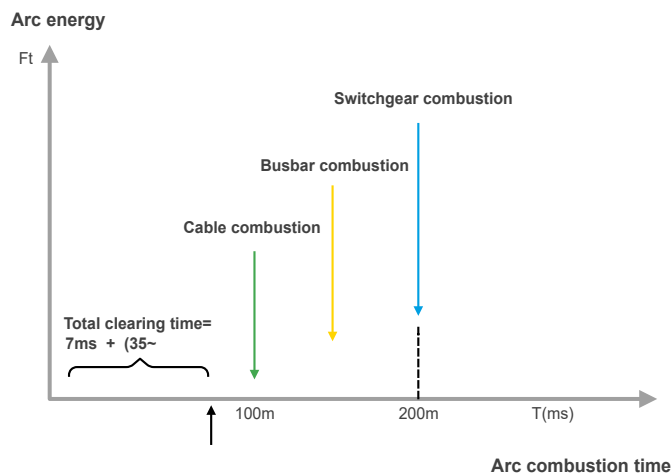
Introduction

AFR series arc protection relay detects electrical arcs in medium and low-voltage equipment, isolating power to minimize the risk of electrical fires. It works to prevent arcing faults in busbars, metal-clad switchgear, and cable boxes.

Arc flash relays can connect with remote light sensors to detect arc flashes and send a trip signal to cut off power. They can be used for stand-alone devices or embedded in complex switchgear layouts.



Arc Hazard Diagram



Main Features

- Accurate and real-time monitoring arc signals.
- High temperatures and humidity resistance.
- Fast response, relay tripping in less than 10 ms.
- Equipped with RS485 communication interface.
- Support ST visible light and ST ultraviolet sensor access.
- Complete SOE records, all information power-off retention.
- Support automatic reclosing function to improve system availability.

Application

- Capacitor cabinet.
- High voltage switchgear.
- Electric power substation.
- Large municipal engineering project.
- Medium and low voltage switchgear.
- Thermal power plant electrical section switchgear.
- Wind turbine & Wind farm and photovoltaic station switchgear.

AFR-M ARC FLASH PROTECTION RELAY

BUSBAR PROTECTION RELAY



Introduction

AFR-M busbar ARC flash protection relay represents a cost-effective and highly efficient solution designed to mitigate arc-fault damage. AFR-M detects the emitted light from an arc flash and promptly triggers tripping relay in both low-voltage (LV) and medium-voltage (MV) electrical networks.

Equipped with up to 48 ultraviolet optical sensors, the relay operates on preset programs, ensuring optimal protection for the secure operation of bus circuits.

Terminal Definition

A-Pwr board	B-DO relay board	C-Arc sensor terminal-1	D-Arc sensor terminal-2	E-Arc sensor terminal-3	F-Arc sensor terminal-4	G-DO Comm board	H-Current sensor terminal
A01 Terminal Label A02 I/O Channel A03 I/O Channel A04 I/O Channel A05 I/O Channel A06 I/O Channel A07 I/O Channel A08 I/O Channel A09 I/O Channel A10 I/O Channel A11 Arc Sensor C1 A12 Arc Sensor C2 A13 Arc Sensor C3 A14 Arc Sensor C4 A15 Arc Sensor C5 A16 Arc Sensor C6 A17 Arc Sensor C7 A18 Arc Sensor C8 A19 Arc Sensor C9 A20 Arc Sensor C10 A21 Arc Sensor C11 A22 Arc Sensor C12	B01 DO-1 B02 DO-1 B03 DO-2 B04 DO-2 B05 DO-3 B06 DO-3 B07 DO-4 B08 DO-4 B09 DO-5 B10 DO-5 B11 DO-6 B12 DO-6 B13 DO-7 B14 DO-7 B15 DO-8 B16 DO-8 B17 DO-9 B18 DO-9 B19 DO-10 B20 DO-10 B21 DO-11 B22 DO-11	C01 ARC01 C02 ARC02 C03 ARC03 C04 ARC04 C05 ARC05 C06 ARC06 C07 ARC07 C08 ARC08 C09 ARC09 C10 ARC10 C11 ARC11 C12 ARC12	D01 ARC13 D02 ARC14 D03 ARC15 D04 ARC16 D05 ARC17 D06 ARC18 D07 ARC19 D08 ARC20 D09 ARC21 D10 ARC22 D11 ARC23 D12 ARC24	E01 ARC25 E02 ARC26 E03 ARC27 E04 ARC28 E05 ARC29 E06 ARC30 E07 ARC31 E08 ARC32 E09 ARC33 E10 ARC34 E11 ARC35 E12 ARC36	F01 ARC37 F02 ARC38 F03 ARC39 F04 ARC40 F05 ARC41 F06 ARC42 F07 ARC43 F08 ARC44 F09 ARC45 F10 ARC46 F11 ARC47 F12 ARC48	G01 RS485+ G02 RS485- G03 RS485+ G04 RS485- G05 RS485+ G06 RS485- G07 RS485+ G08 RS485-	H01 I01 I02 I03 H02 I04 I05 I06 H03 I07 I08 I09 H04 I10 I11 I12 H05 I13 I14 I15 H06 I16 I17 I18 H07 I19 I20 I21 H08 I22 I23 I24 H09 I25 I26 I27 H10 I28 I29 I30 H11 I31 I32 I33 H12 I34 I35 I36 H13 I37 I38 I39 H14 I40 I41 I42 H15 I43 I44 I45 H16 I46 I47 I48 H17 I49 I50 I51 H18 I52 I53 I54 H19 I55 I56 I57 H20 I58 I59 I60

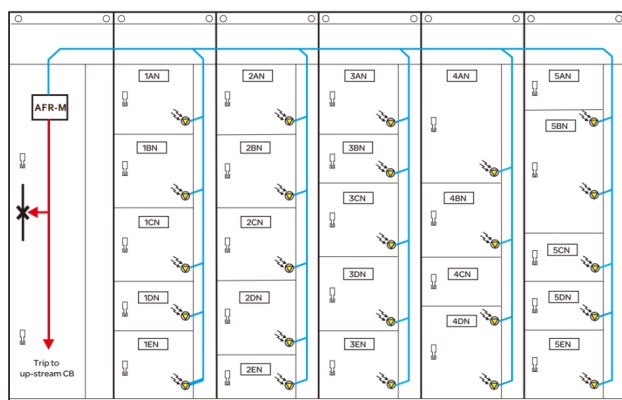
Main Features

- Arc light and current dual criterion.
- Total 4*3-phase current signal input.
- 16* passive DI point, indicates CB status.
- Single unit max 48pcs opt-sensor connected.
- HD LCD display to show integrated information.
- Independent trip act and alarm act arc flash relay.
- 9* trip contacts, free to configuration protect trip logic.
- Optional extra monitor functions by RS485 connection.
- Panel mounting design with rugged aluminum housing.
- 1* ethernet port support IEC60870-5-103 communication.
- Less than 10 ms operation time from arc flash to arc relay trip.

Application

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- High voltage switchgear.
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Wiring Method



AFR-M Multiple switchgear protection

AFR-3S ARC FLASH PROTECTION RELAY

BUSBAR PROTECTION RELAY

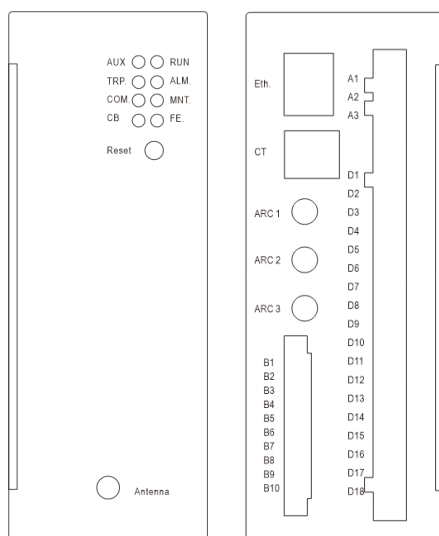


Introduction

AFR-3S Arc flash protection relays serve as crucial components for detecting arc faults in electrical systems, ensuring the protection of equipment and personnel. AFR-3 adopts advanced monitoring of parameters such as current, voltage, and electric power to swiftly identify arcs.

Designed for application in medium and high-voltage power distribution systems, control cabinets, transformers, generators, motors, and various electrical equipment, the AFR-3 Arc flash relay operates based on a dual-criteria principle. Combining arc light detection with overcurrent detection, it delivers rapid protection responses and high reliability.

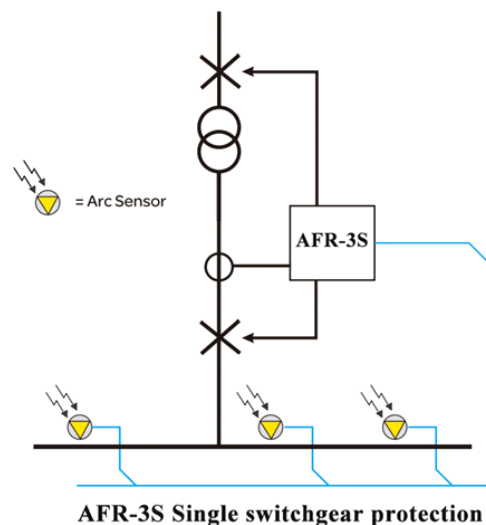
Terminal Definition



Main Features

- Advanced electrical power parameter monitoring.
- Support standard 35mm rail installation.
- Fast response, Identify arc faults in electrical systems.
- Effectively reduce the risk of fire in electrical systems.
- Quickly cut off the power supply to protect electrical safety.
- Adopt the dual criterion of arc detection and overcurrent detection.
- Comprehensive SOE record for analysis and system optimization.

Wiring Method



AFR-3S Single switchgear protection

AFR-4 ARC FLASH PROTECTION RELAY

BUSBAR PROTECTION RELAY



Introduction

AFR-4 is a versatile and independently operating device for bay based protection. It supports 4-channels arc signal detection and can configuration multiple arc tripping modes, ensuring accurate and fast fault isolation. With a fast relay output speed up to 5ms, AFR-4 can minimize or completely eliminate arc flash damage, improving system safety and reliability. It can be used in various arc protection applications in low or medium voltage power distribution system.

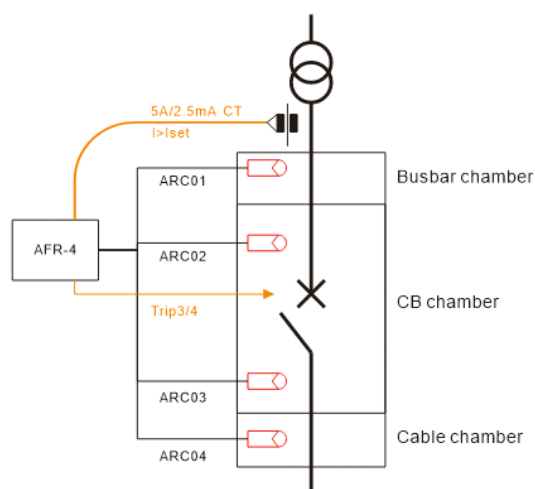
AFR-4 also provides flash warning and dual criteria tripping mechanism (arc detection + current), providing a comprehensive solution for arc flash protection. Integrated RS485/Modbus communication enables seamless remote monitoring and control, which is ideal for modern power systems.

Main Features

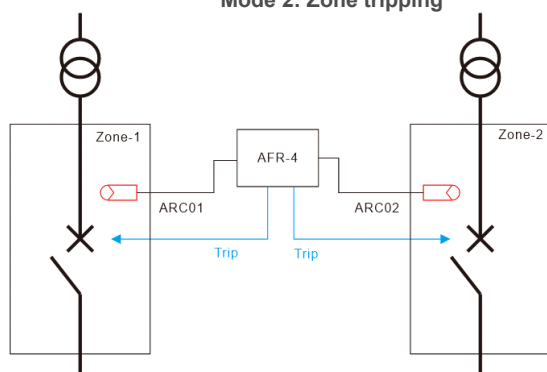
- $\leq 5\text{ms}$ fast relay tripping;
- Regional arc light detection
- Multiple combined tripping modes;
- Circuit breaker failure protection;
- 4 channels of arc light signals detection;
- Support 35mm DIN rail or panel mounting
- Dual criteria for arc detection and overcurrent detection;
- Integrated /RS485 MODBUS communication protocol;
- Support ST visible light and ST ultraviolet sensor access.

Typical Wiring

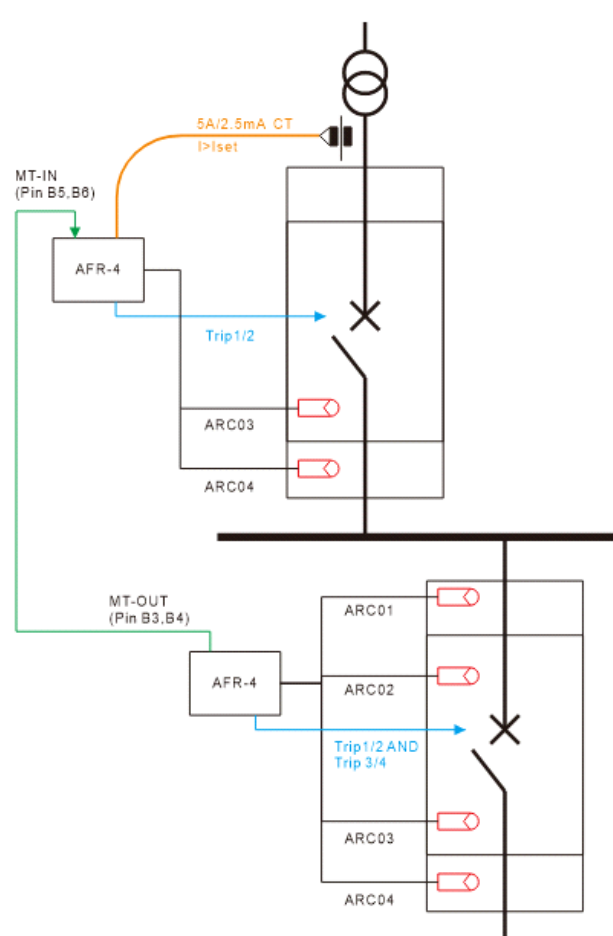
Mode 1: local tripping



Mode 2: Zone tripping



MT Mode: Master station tripping



Technical Characteristics

	AFR-M	AFR-3S	AFR-4
Basic parameter			
Power supply	85~265Vac/dc	85~265Vac/dc optional 15-70Vdc	
Consumption	Monitoring <8W; DO triggered <10W		
Protection range	0~20 In	0.06~10 In	
Rated current (In)	5A or 1A		
Burden	<0.5VA		
Protect current accuracy	<4%		
Protect frequency accuracy	0.1Hz		
Arc signal input & control			
Channels number	12-48	3	4
Sensor type	Optical fiber		
Detection light type	Visible light/UV light (optional)		
I/O capacity			
Digital input	16* DI, 5A@250Vdc, wet contact,optional dry contact	5*DI, 5A@250Vdc, NO; dry contact	
Digital output	8A@250Vac, dry contact	10A@250Vac/ 12A@24Vdc, dry contact Max. switching current: 10 A(dc)/ 12A(ac) Max. switching voltage: 277Vac/ 300Vdc.	
Trip action time	Pure arc protection: ≤10ms Overcurrent + arc protection: ≤20ms		
DO relay channels	9	4/6 (optional)	7
Safety isolation	Photoelectric isolation, isolation voltage 2500V		
RS485 Communication			
Comm port	RS485 Modbus-RTU (one standard, two optional)		
Isolation type	Photoelectric isolation, lightning protection		
Baud rate	9600bps		
Ethernet communication			
Interface	2-Way Ethernet optional		
Network parameters	10M/100M adaptive		
Default IP	192.168.12.2/192.168.13.2		
Others			
Working environment	-10 ~ 55°C, < 93% RH (Non-condensing)		
Storage environment	-30 ~ 70°C, < 70% RH (Non-condensing)		
Relative humidity	5%~95%		
Atmospheric pressure	60kPa~106kPa		



SCM-OPUV (UV light detection)

- Detection angle: 0-240°
- Photosensitive threshold: 1-10mw/cm²
- Default trigger threshold: 5mw/ cm²



SCM-OPVL1 (Visible light detection)

- Detection angle: 0-240°
- Max.transmission distance: <30 m
- Photosensitive threshold: 5-20KLUX.



SCM-OPVL2 (Visible light detection)

- Detection angle: 0-360°
- Photosensitive threshold: 5-20KLUX
- Trigger threshold: 8KLUX