

AFR SERIES ARC PROTECTION RELAY

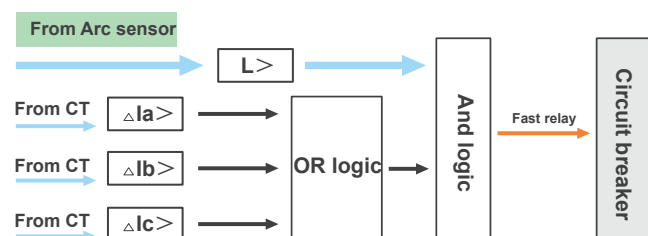
BUSBAR PROTECTION RELAY



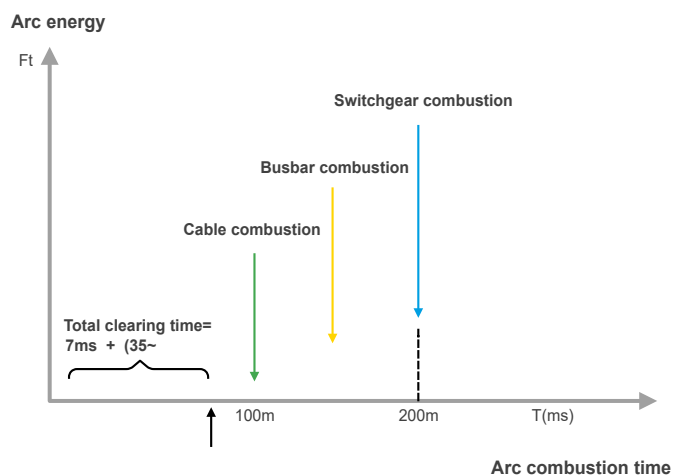
Introduction

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 Potentiometer A02 IOL Channel A03 IOL Channel A04 IOL Tripper A05 IOL Channel A06 IOL Tripper A07 IOL Channel A08 IOL Tripper A09 IOL Channel A10 IOL Tripper 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-2 B03 DO-3 B04 DO-4 B05 DO-5 B06 DO-6 B07 DO-7 B08 DO-8 B09 DO-9 B10 DO-10 B11 DO-11 B12 DO-12 B13 DO-13 B14 DO-14 B15 DO-15 B16 DO-16 B17 DO-17 B18 DO-18 B19 DO-19 B20 DO-20 B21 DO-21 B22 DO-22	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- G09 RS485+ G10 RS485- G11 RS485+ G12 RS485- G13 RS485+ G14 RS485- G15 RS485+ G16 RS485- G17 RS485+ G18 RS485- G19 RS485+ G20 RS485- G21 RS485+ G22 RS485- G23 RS485+ G24 RS485- G25 RS485+ G26 RS485- G27 RS485+ G28 RS485- G29 RS485+ G30 RS485- G31 RS485+ G32 RS485- G33 RS485+ G34 RS485- G35 RS485+ G36 RS485- G37 RS485+ G38 RS485- G39 RS485+ G40 RS485- G41 RS485+ G42 RS485- G43 RS485+ G44 RS485- G45 RS485+ G46 RS485- G47 RS485+ G48 RS485- G49 RS485+ G50 RS485- G51 RS485+ G52 RS485- G53 RS485+ G54 RS485- G55 RS485+ G56 RS485- G57 RS485+ G58 RS485- G59 RS485+ G60 RS485- G61 RS485+ G62 RS485- G63 RS485+ G64 RS485- G65 RS485+ G66 RS485- G67 RS485+ G68 RS485- G69 RS485+ G70 RS485- G71 RS485+ G72 RS485- G73 RS485+ G74 RS485- G75 RS485+ G76 RS485- G77 RS485+ G78 RS485- G79 RS485+ G80 RS485- G81 RS485+ G82 RS485- G83 RS485+ G84 RS485- G85 RS485+ G86 RS485- G87 RS485+ G88 RS485- G89 RS485+ G90 RS485- G91 RS485+ G92 RS485- G93 RS485+ G94 RS485- G95 RS485+ G96 RS485- G97 RS485+ G98 RS485- G99 RS485+ G100 RS485-	H01 I01 H02 I02 H03 I03 H04 I04 H05 I05 H06 I06 H07 I07 H08 I08 H09 I09 H10 I10 H11 I11 H12 I12 H13 I13 H14 I14 H15 I15 H16 I16 H17 I17 H18 I18 H19 I19 H20 I20 H21 I21 H22 I22 H23 I23 H24 I24 H25 I25 H26 I26

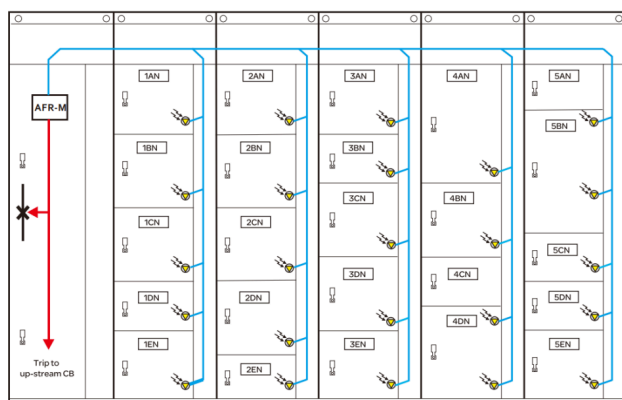
Main Features

- Arc light and current dual criterion.
- 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

- 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.

Wiring Method



AFR-M Multiple switchgear protection

AFR-3S ARC FLASH PROTECTION RELAY

BUSBAR PROTECTION RELAY

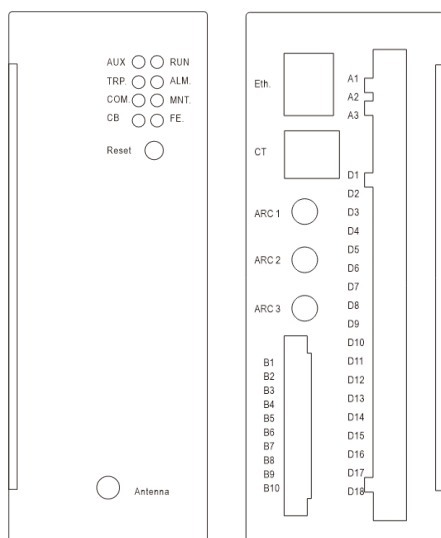


Introduction

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.

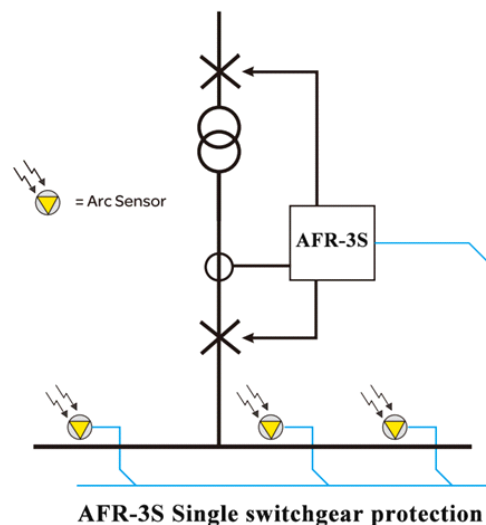
Terminal Definition



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-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.

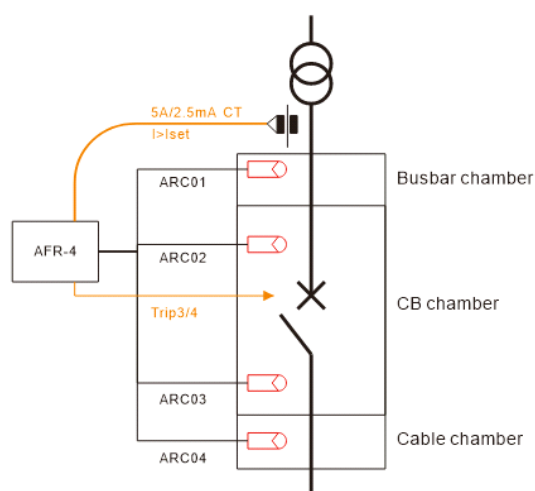
AFR-4 also provides flash warning and dual criteria tripping mechanism (arc detection + current), providing a comprehensive solution for arc flash protection. Integrated RS485/Modbus communication enables seamless remote monitoring and control, which is ideal for modern power systems.

Main Features

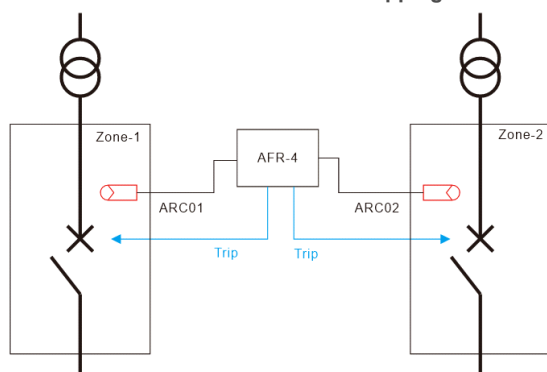
- $\leq 5\text{ms}$ fast relay tripping;
- Regional arc light detection
- Multiple combined tripping modes;
- Circuit breaker failure protection;
- 4 channels of arc light signals detection;
- Support 35mm DIN rail or panel mounting
- Dual criteria for arc detection and overcurrent detection;
- Integrated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

Typical Wiring

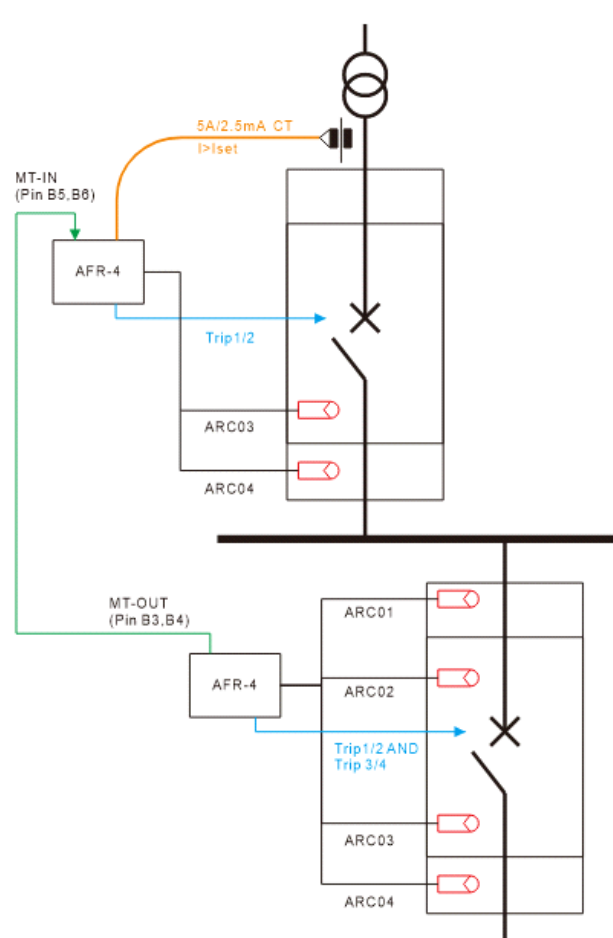
Mode 1: local tripping



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%		
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	2*DI (For Block/ MT in) Passive, 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		Pure arc protection: ≤8ms Overcurrent + arc protection: ≤15ms
DO relay channels	9	4/6 (optional)	7
Safety isolation	Photoelectric isolation, isolation voltage 2500V		
RS485 Communication			
Interface	RS485 Modbus-RTU (one standard, two optional)		
Isolation type	Photoelectric isolation, lightning protection		
Baud rate	9600bps		
Ethernet communication (optional)			
Interface	2 chanelns 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		

Related Accessories



SCM-OPVL1 (Visible light detection)

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



SCM-OPUV (UV light detection)

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