AF-01: PGR-8800 ARC-FLASH RELAY GUIDEFORM SPECIFICATIONS

1. Arc-Flash Relay
Arc-Flash Detection and Arc-Flash Overcurrent (50, 50TD, AFD)

1.2 Description
Microprocessor-based relay that utilizes optical sensors to limit arc-fault damage by detecting the light from an arc flash and rapidly tripping two circuit breakers. Optional 5A secondary current transformers should be used to detect the rising current for validation purposes (detecting both light and current significantly reduces the potential of nuisance trips).

1.3 Optical Sensors
Optical sensors and adjustable trip level reduce the chance of nuisance tripping by setting a threshold for ambient light. Optical sensors shall collect light over a wide angle and with high sensitivity.

1.3.1 Optical Sensors per Relay
The Arc-Flash Relay shall have the capability of receiving detection from six (6) photoelectric external point sensors or fiber sensors and one (1) local sensor located on the relay.

1.3.2 Optical Sensors per System
For systems that require more than six (6) sensors, the Arc-Flash Relay shall be capable of linking with three other Arc-Flash Relays, creating a system with up to a total of 24 external point sensors or fiber sensors. System shall be capable of tripping a single or multiple circuit breakers in different locations.

1.3.3 Optical Sensor requirements
Each optical sensor, either Point or Fiber, shall be have the following characteristics:
- Trip Level: 10 to 40 klux
- Time Delay: 1 to 20,000 ms
- Detection Zone: 180° x 2.5m for Point and 360° x 8m for Fiber
- Electrical Cable: Shielded 3-wire 0.5 mm² (#20 AWG)
- Sensor Check: Built-in LED for visual feedback and alarm if sensor is unplugged, broken wire, or damaged. Indication shall be on the Arc-Flash Relay and Sensor.
- Sensor Trip Indication: Sensor shall indicate which sensor detected an arcing condition and tripped relay. Indication shall be on the Arc-Flash Relay and Sensor.

1.4 Sensor Location
Coordinate with switchgear manufacturer to optimally mount 1 or 2 sensors per cubicle to cover all horizontal and vertical bus bars, breaker compartments, drawers, and anywhere that there is potential for an arc-fault.

1.5 Current Transformers
Current transformers reduce the chance of nuisance tripping by setting a user-definable threshold for phase currents.
- Inputs: 3-phase 5 A secondary (10 A continuous, 75 A for 1 s)
- Burden: <0.25 VA, inputs @ 5 A
- Current range: 1.5-15 A

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1.6 Display
Front-panel and sensor LED's shall indicate sensor health and which sensor detected the arc fault.

1.7 Supply Voltage
- AC: 85 to 230 VAC
- DC: 12 to 50 VDC, 100 to 250 VDC
  - The unit can charge a 24 V backup/trip battery – Lead-acid-gel cell
- Operating Temperature: -25 to 70° C

1.8 Indication Contacts
Three Form C (N.O. / N.C.), (5 A Resistive, 250Vac or 30Vdc)

1.9 IGBT Response Time
- Normal Operation: < 1 ms
- On power-up, DC Supply: 2 - 4 ms
- On power-up, AC Supply: 35 - 40 ms

1.10 Trip Coil Output
IGBT switch, 200 µs on time, 1-5 s pulsed (configurable, thermally protected). Configure trip coil to trip main circuit breaker as shown on control schematics. The Arc-Flash Relay shall continuously monitor the health of the wires and trip coil and alarm if faulty.
- One Form A (N.O.), (IGBT Switch)

1.11 Safety Features
Redundant internal trip circuit – Relay shall have a redundant internal trip circuit that is independent on the microprocessor or its software. Any failure in the primary path (microprocessor) will cause the unit to automatically switch to its redundant path in order to ensure arc flash protection even in case of microprocessor failure or during microprocessor initialization right after power up of the relay.

1.12 Software / Communications
Windows®-based PC Software shall be installed on relay and not on a PC. Upon plugging in a USB cable to relay, relay shall be identified as an external drive in Windows® Explorer. Configuration files and relay data (light and current) shall be viewed on a graph over time. The Arc-Flash Relay shall have minimum Modbus® RTU communications.

1.13 Certifications
The Arc-Flash Relay shall have the following certifications: UL, CSA, and CE.

1.14 Manufacturer & Warranty
Littelfuse, or approved equal. The Arc-Flash Relay shall have a minimum of five (5) year warranty.