General description
Arc monitor with detectors

Introduction
The two units of the Arc Guard System™, arc monitor, and the current sensing unit are each built into a light-alloy enclosure provided with a hinged door.
Communication between the units and between arc monitor and detectors is through optical cables.

Optical fiber cables
The optical fiber cables cannot be cut or joined and they must be run in smooth curves during installation. Optical fiber cables and detectors with optical fiber cables are available in certain standard lengths, see page 2. Greater lengths than these can be quoted on request.

Detectors
Each detector consists of a lens arrangement for collecting light. An optical fiber cable is connected to the lens. The detector monitors a large space angle. The polar diagram should be regarded as three-dimensional since the detector is sensitive to light from all directions, with the exception of a small area behind the detector.

Factory testing has shown that arc light reflected between metallic surfaces is also sufficient to cause tripping. However, we do recommend one detector per each enclosed switchgear compartment.

The detectors are connected to the arc monitor by means of plug-in sleeve terminals.

A maximum of nine detectors can be connected to an arc monitor. If more detectors are required, up to twelve units may be connected in parallel.

Arc monitor
• Available for AC and DC power
• Photodiodes are used for sensing light.
• The two output stages are triacs triggered via a pulse transformer. In this way, detectors and output stage are electrically isolated from other electronic equipment.
• The arc monitor has two separate relay outputs. Each relay has one change-over (Form C) contact function. Relay K1 is used for EXTERNAL TRIP indication and relay K2 is used for POWER ON indication.
• A switch is included for selection of automatic relay resetting (after approximately 200 ms) or manual resetting of relay K1.
• A digital display, visible through the window in the door, is lighted when the triac outputs are activated and shows which detector has caused tripping. The display and relay are reset using a pushbutton accessible from the outside. The arc monitor can trip even if it is not reset.
• Terminals are provided for connection of the arc monitor's own power supply and for connections to the circuit-breaker trip coil. There are units for plug-in connection of optical fiber cables from the detectors and for communication with any current sensing unit.
• The power consumption of the unit is approximately 6 watts. Energy is stored in the unit for operation up to 200ms should the supply voltage fail, which is sufficient to activate the output even if voltage disappears in conjunction with the short circuit for which the arc monitor operates.

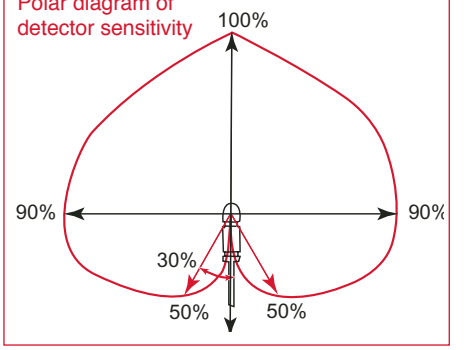
Tripping of several breakers
For tripping several breakers an additional relay is often required. This must be as fast as possible so as not to delay tripping and thus make damage worse.

For DC supply, ABB's relay type RXMS (Cat. No. RK 216 263-...) with 4 ms pickup time is suitable. Where a greater load capacity is required this relay can be connected in parallel with relay type RXMH (Cat. No. RK 223 067-...).

The current to the intermediate relay must be interrupted since the triacs of the arc monitor have no breaking capacity for DC. This can be done by having a pushbutton or time-lag relay break the circuit or by connecting the signal relay contact K1 of the arc monitor in parallel with the triacs. Then activate automatic reset inside arc monitor (DIP-switch S1.2).

Arc monitor

Polar diagram of detector sensitivity



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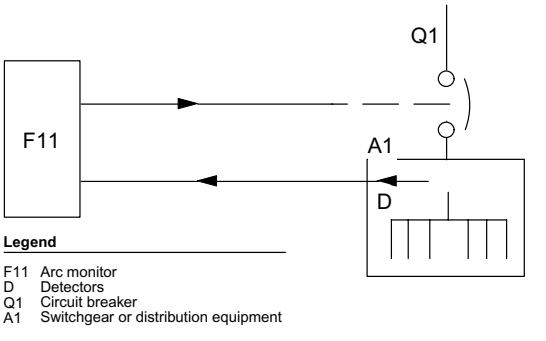

Legend

F11 Arc monitor
D Detectors
Q1 Circuit breaker
A1 Switchgear or distribution equipment