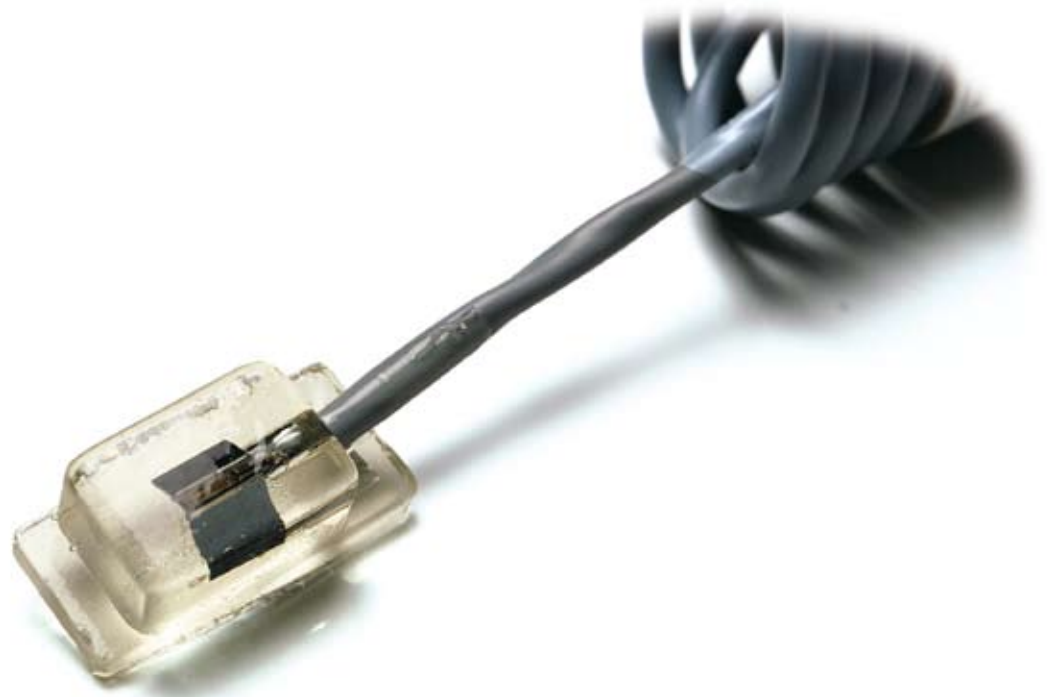


# Arc-fault Protection System

## Protection of Switchboards



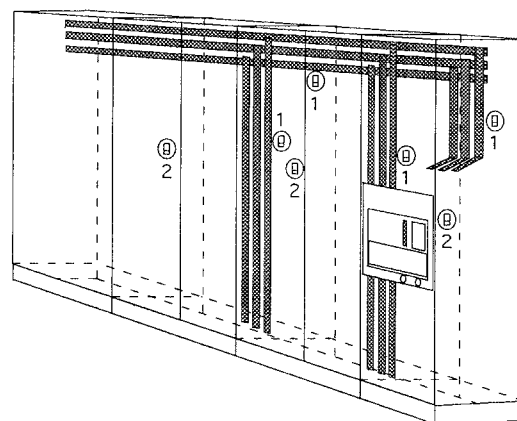
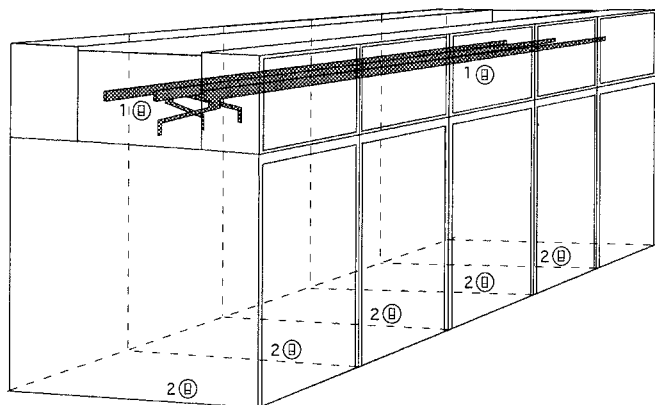
- Improve personnel safety.
- Minimize production down time.
- Reduce damage to material and the cost of repair or replacement.

Arcing faults in switchboards can cause severe damage against material as well as personnel.

The main issue is that no two arcing are the same, and it is therefore very difficult to know in advance how to prevent them. Whenever arcing occurs the pressure generated by the rapid increase in temperature is strong enough to break off cabinet doors. Further the light of the arcing, ultraviolet, and infrared, is dangerous for personnel, eyes and skin.

All of the above points should be taken into consideration in the Total Cost of Ownership, TCO, of a switchboard, and by using the SELCO Arc Detecting Relays you will be able to reduce these costs and eliminate the points listed.

# Arc-fault Protection System



The SELCO Arc-fault Protection System is based on experience with arc protection since 1962. The system units are built into boxes all fitting 35mm DIN-rails. Front plates are dimensioned to fit into the 45mm slot in the cover plates of a DIN-system.

The Arc Detecting Relay is connected to light sensitive detectors suitably placed in the various cubicles or drawers inside the switchboard. The Overcurrent Relay is used if overcurrent protection is required as well.



## Arc Detecting Relay/ Current Relay/Time Relay

To be placed in the switchboard or in connection with it. It is recommended that the Arc Detecting Relay, the Current Relay and the Time Relay are installed in the relay box or otherwise separated from the circuit breaker to be tripped.

## Junction box for parallel connection

To be installed considering the length of the detector cables (5 metres). Junction boxes with indication are installed so that the LED's are fully visible. Max. 2 junction boxes per Arc Detecting Relay.

## Arc Detectors

Installation: 1-2 pcs. per cubicle or drawer, see drawings on page 4.  
At horizontal/vertical bus bars (1) and in breaker/cable compartments (2).

# Arc-fault Protection



## D0100 Arc Detecting Relay for 24-220V DC battery supply

For use with:

- A0200
- A0300
- D0400
- D0500
- D0700

The D0100 is a detecting relay which can monitor up to 16 arc detectors in parallel through D0400 or D0500 Junction Boxes. In case of an arcing fault, the relay generates a fast tripping pulse, less than 1msec., to the circuit breaker(s) supplying the installation. The arcing time is thus reduced to the mechanical opening time of the circuit breaker. The relay is solid state with complete isolation between input and output. Thus the relay and the circuit breaker may have different pilot voltages.

The TEST-position on the relay is used to test the tripping without opening the circuit breaker. The 2 free signal contacts are for remote indication of arcing fault trip and indication for absence of pilot voltage - or for indication of the TEST-function is activated.

The sensitivity to light is adjustable on the front plate SENS.ADJ knob within 1-12mA. The range is 2.000-24.000lux enabling you to use the sensors under different light conditions, indoor light, sunlight etc. The preset is 6mA/12.000lux.



## D0400 Junction Box

For use with:

- D0100
- D0900
- A0200
- A0300

The D0400 is for connection of up to 8 detectors in parallel without indication.



## A0200/A0300 Detector

For use with:

- D0100
- D0900
- D0400
- D0500

The A0200/A0300 both reacts on light and is available with 180° or 360° characteristic. To be installed in each cubicle/drawer and should be shielded from normal switching arcs. Detectors are supplied with 5m, 10m or 15m of cable and a mounting bracket.



## D0900 Arc Detecting Relay for AC supply

For use with:

- D0400
- A0200
- A0300

The D0900 is a detecting relay which can monitor up to 16 arc detectors in parallel through D0400 Junction Box.

In case of an arcing fault, the relay generates a fast tripping pulse, less than 1 mSec., to the circuit breaker(s) supplying the installation. The arcing time is thus reduced to the mechanical opening time of the circuit breaker. The relay is solid state with complete isolation between input and output.

The relay has energy stored in a storage capacitor charged with a DC voltage to trip the circuit breaker.

The TEST-position on the relay is used to test the tripping without opening the circuit breaker. The 2 free signal contacts are for remote indication of arcing fault trip and indication for absence of pilot voltage - or for indication of the TEST-function is activated. Both contacts are activated after tripping as the relay normally disconnects its own supply voltage.

The sensitivity to light is adjustable on the front plate SENS.ADJ knob within 1-12mA. The range is 2.000-24.000lux enabling use of sensors under different light conditions, indoor light, sunlight etc. The preset is 6mA/12.000lux.

# Arc-fault Protection



## D0500 Junction Box with Indication

For use with:

- D0100
- A0200
- A0300

The D0500 is designed to connect up to 8 detectors in parallel and has a separate indication of which detector(s) caused tripping by means of a red LED for each detector. The red LED is lit when the light intensity exceeds 6.000lux. on the detector, but it turns off again if the intensity goes below 6.000lux. At 12.000lux. the arc detecting relay is triggered, the active LED's are latched and a yellow LED (TRIP) is turned on. All LED's remain turned on until reset by a common RESET button. Max. 2 boxes per arc detecting relay is allowed



## D0700 Overcurrent Relay

For use with:

- D0100

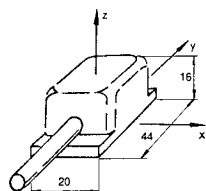
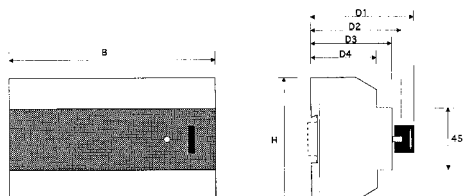
The D0700 is a 3-phase current relay to be used in combination with a DC arc detecting relay. The current setting range is  $1.5-3.0 \times I_n$  (7.5-15A). Each time the set current is exceeded a red LED (TRIP) turns on and an output relay activates. The relay contact - normally closed - opens and cancels the blocking of the arc detecting relay making it able to trip the supply breaker in the case of an arcing fault. The function of the arc detecting relay is thus made dependent on the current at the time of the arcing fault. However arcing time is increased.

## Connection Possibilities

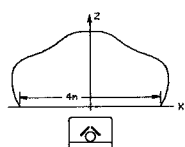
|                                 | A0200 | A0300 | D0100 | D0400 | D0500 | D0700 | D0900 |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|
| A0200 Detector                  |       |       | X     | X     | X     |       | X     |
| A0300 Detector                  |       |       | X     | X     | X     | X     |       |
| D0100 Arc Detecting Relay DC    | X     | X     |       | X     | X     |       | X     |
| D0400 Junction Box              | X     | X     | X     |       |       |       |       |
| D0500 Junction Box w/Indication | X     | X     | X     |       |       |       |       |
| D0700 Overcurrent Relay         |       |       | X     |       |       |       |       |
| D0900 Arc Detecting Relay AC    | X     | X     |       | X     |       |       |       |

# Specifications

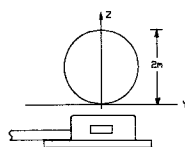
## SELCO Arc-fault Protection System



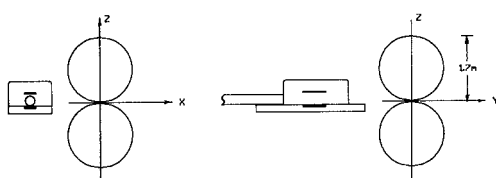
Light intensity from an arc current of min. 3kA detected inside of the curves will trip the breaker.



A0200, 180 degrees



A0300, 360 degrees



### D0100 - Arc Detecting Relay DC

|                      |                                                              |
|----------------------|--------------------------------------------------------------|
| Voltage Supply:      | 24-220V DC from battery.                                     |
| Triac output:        | 250V AC/DC, 8A cont. 25A/ 0.1sec.<br>Min. load current 50mA. |
| Signal contacts:     | 2 free/220V AC/DC 1A max. 50W.                               |
| Sensitivity:         | 1-12mA, pre-set trip 6mA/12000 lux.                          |
| Number of detectors: | Max. 16 pcs.                                                 |
| Response time:       | Less than 1msec.                                             |
| Power consumption:   | 4.3W.                                                        |
| Ambient temperature: | -25 to +70° C.                                               |

### D0500 - Junction Box with indication

|                      |               |
|----------------------|---------------|
| Power consumption:   | 0.6W.         |
| Ambient temperature: | -25 to +70°C. |

### D0700 - Overcurrent Relay

|                      |                                     |
|----------------------|-------------------------------------|
| Voltage Supply:      | 48-220V DC from battery.            |
| Current inputs:      | 3-phase 5A cont., 75A / 1sec.       |
| Burden:              | 0.5VA/input at 5A.                  |
| Current range:       | 1.5-3.0 x I <sub>n</sub> (7.5-15A). |
| Response time:       | 20-30 mSec.                         |
| Power consumption:   | 2.6W.                               |
| Ambient temperature: | -5 to +55°C.                        |

### D0900 - Arc Detecting Relay AC

|                                      |                                                                                                                                                                                                 |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage Supply:                      | 220-250V AC.                                                                                                                                                                                    |
| Thyristor output with stored energy: | Storage capacitor 66 µF charged to 300V DC. E=2.97Wsec. (Joule).<br>Life time min 30 years at 50°C.<br>Min. load current 50mA.<br>Charging time approx. 1 sec.<br>Discharge time approx. 1 min. |

|                      |                                     |
|----------------------|-------------------------------------|
| Trip coil:           | 230V AC.                            |
| Signal contacts:     | 2 free, 230V AC/DC 1A max.50W.      |
| Sensitivity:         | 1-12mA, pre-set trip 6mA/12000 lux. |
| Number of detectors: | Max. 16 pcs.                        |
| Response time:       | Less than 1 msec.                   |
| Power consumption:   | 3.5 W.                              |
| Ambient temperature: | -25 to +70°C.                       |

### Environment

|                |                              |
|----------------|------------------------------|
| EMC standards: | EN50081-1/2 and EN50082-1/2. |
| Enclosure:     | IP31.                        |

### Dimensions

| Item no. | Dim. mm |    |    |    |    |    |
|----------|---------|----|----|----|----|----|
|          | B       | H  | D1 | D2 | D3 | D4 |
| D0100    | 105     | 90 | 75 | 70 | 60 | 49 |
| D0900    | 105     | 90 | 75 | 70 | 60 | 49 |
| D0400    | 72      | 90 | —  | —  | 58 | 48 |
| D0500    | 72      | 90 | —  | 70 | 58 | 48 |
| D0700    | 105     | 90 | —  | —  | 60 | 49 |
| D0800    | 72      | 90 | 75 | 70 | 58 | 48 |

The specifications are subject to change without notice.



## SELCO Worldwide

- SELCO Denmark
- SELCO Subsidiary
- SELCO Representation and area of supply

Argentina  
 Australia  
 Austria  
 Belgium  
 Brazil  
 Bulgaria  
 Chile  
 China  
 Croatia  
 Czech Republic  
 Egypt  
 Finland

France  
 Germany  
 Greece  
 Hong Kong  
 Hungary  
 Iceland  
 India  
 Indonesia  
 Iran  
 Italy  
 Japan  
 Korea

Malaysia  
 Morocco  
 Netherlands  
 New Zealand  
 Norway  
 Pakistan  
 Philippines  
 Poland  
 Portugal  
 Romania  
 Russia  
 Singapore

South Africa  
 Spain  
 Sweden  
 Taiwan  
 Thailand  
 Turkey  
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 U.S.A.

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