

TVOC

Arc Monitor

1SFA663001R1003, 1SFA663001R1004

1SFA663007R1011 Edition 4 October 2003 (English)

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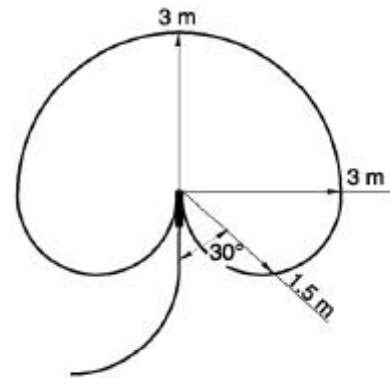
1 Detectors

1 Detectors

1.1 Detectors

Each detector monitors approx. a sphere with a radius of 3 meters. See fig. Backward within an angle of 30° from the detector axis the sensitivity is very much reduced.

For further information regarding location of detectors, see Instruction 5609 189-E.



The figure illustrates how the sensitivity of the detector is reduced for different angles.

1.2 Glass fibre and plastic fibre cables

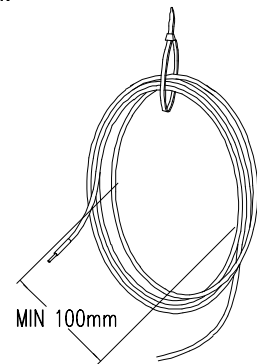
All types have pre-designated lengths and must not be shortened. Excess cable should be wound up and kept as a ring with a diameter of at least 100 mm, as shown in the figure. The cable that has been wound up should not be fastened together in the middle, as this can harm the fibres.

The glass fibre cables are not to be bent in a loop with a radius less than 20 mm occasionally and 50 mm continuously.

The plastic fibre cables are not to be bent in a loop with a radius less than 10 mm occasionally and 45 mm continuously.

These restrictions are to ensure a maximum lifetime for the cables, even at high temperatures.

The ends must be kept clean and, if needed, be wiped off before connecting them to the unit.



1.3 Connection possibilities

Plastic fibre detectors with cat. No. 1SFA 663003R1... or SK 663126-..¹⁾ and glass fibre detectors with cat. No. SK 663125-.. are suitable to Arc Monitors with cat. No. 1SFA663001R1001, ..R1002, ..R1003, 1SFA 663001-A¹⁾, -B¹⁾, SK 663121-..¹⁾ and SK 663122-..¹⁾.

¹⁾ old generations.

2 Arc Monitor

2 Arc Monitor

2.1 Mounting of apparatus

The units should be mounted with the flange opening facing downwards, inside a cubicle or separately on a wall or stand.

2.2 Electrical Installation

The apparatus should be earthed for protection.

Arc Monitor (see diagram 3.1)

The supply voltage is connected to terminals 13 and 14.

The triac outputs, terminals 20, 21 and 22, 23, are used for circuit-breaker tripping.

If a DC voltage is used, the + is to be connected to terminal 21 or 23.

Please observe that a triac cannot break DC.

The signal relay K1, terminals 28,29 and 30, is used for external indication that the unit has tripped.

The signal relay K2, terminals 25,26 and 27, is used for external indication that the unit is in operation.

2.3 Connection of Optical Fibre Cables and Detectors

General

Before the detectors can be connected to the apparatus the protective covers on the input terminals must be removed. Please note that unused optical inputs must have their protective covers left on, to avoid unjustified tripping signals coming from them.

When connecting the detectors to the apparatus the end sleeve of the optical fibre is pressed to the bottom of the connection terminal. Please check that it can not be removed easily by gently pulling the optical cable.

Arc Monitor

The detectors are connected to the detector inputs, i.e. the optical fibre connectors 1...4.

2.4 Checking

Test after installation, performed before the unit goes into use

The supply voltage is switched on.

Arc Monitor

The decimal point on the display will be lit and the relay contact 25 - 26 open, when the supply voltage is on.

A fault is simulated by using a camera flash with a flashing time of approximately 0.5 ms. At normal sensitivity the Arc Monitor will react to a camera flash, guide number = 16 (m) 21 DIN/100 ASA, at a distance of more than 1.5 m from the detector and pointed towards the detector without any object standing in the way.

The test is done for each installed detector and every time it should be checked that the display shows the correct detector number and that the circuit-breaker trips. Reset must be done after each test to allow a new digit to be shown.

Test when in use

To enable a test to be done when the Arc Monitor is in use, the trip circuit can be disconnected by opening the terminals 21 and 23. **Warning:** Since the breaking capacity of the disconnectable terminal blocks are very low, they must not be opened when there is current flowing in the circuit.

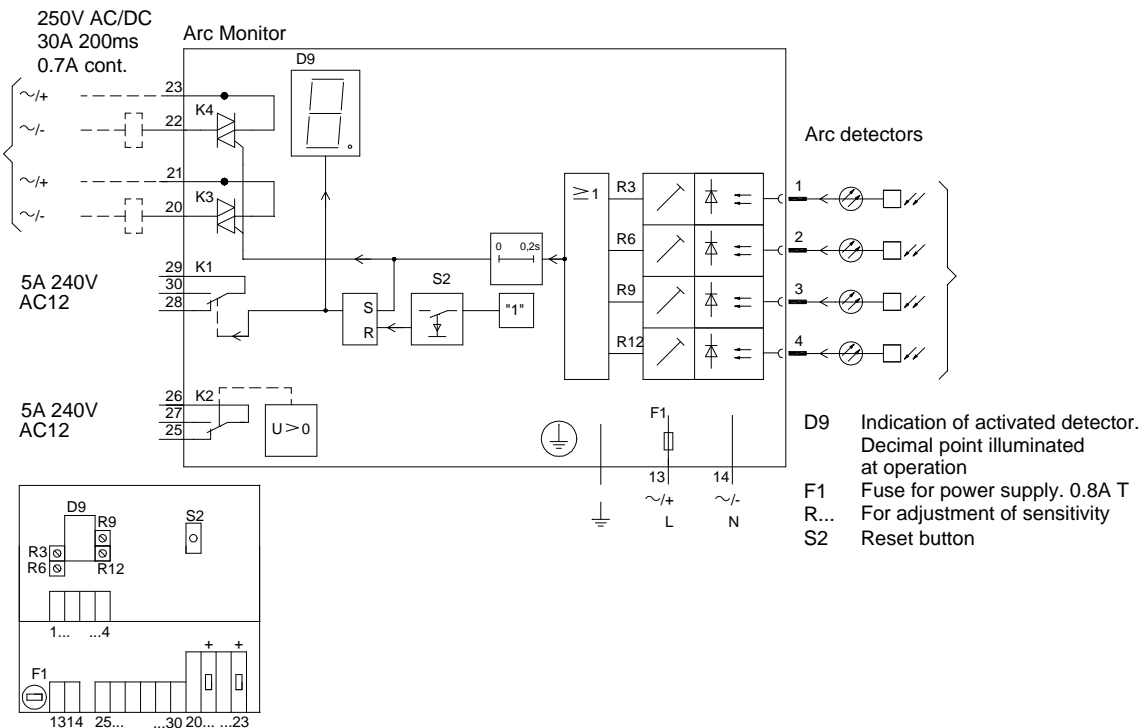
DO NOT FORGET TO RECONNECT THE TERMINALS 21 AND 23 AFTER THE TEST.

A **check of the function** is recommended after every arc fault and should be carried out regularly too, e.g. once a year or at least once every second year. This applies to all units.

3 Diagrams and lay-out

3 Diagrams and layout

3.1 Arc Monitor



3.2 Explanations

- D 9 Indication of activated detector. Decimal point illuminated at operation.
- F1 Fuse for power supply. 0.8 A T
- K3, K4 Solid state contacts (triacs) for tripping circuit-breakers.
- K1 Relay for **trip** indication
- K2 Relay for **in service** indication
- R... Trimming potentiometer for adjustment of sensitivity. Should normally not be adjusted.
- S2 Reset button.

4 Installation of Arc Guard System in MNS

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4.1 Detector location

Location in an apparatus cubicle

The horizontal and vertical busbars in an apparatus cubicle can be monitored by a detector located above the busbars. A single detector is able to monitor the busbars in both the apparatus cubicle and the cable cubicle belonging to it.

To fasten the detector a simple plastic mounting bracket 1SFA663006R1001 or 1SFA663006R1002, should be screwed on to the upper part of the cubicle frame, in the fourth hole from the right side, see fig. 1. The holes in the mounting bracket are suitable for M5 thread rolling screws or ST 5,5 tapping screws. The bend of the mounting bracket should point downwards and the detector should be attached to the upper side of it by a 2.5 mm wide cable strap, see fig. 2. The detector should be attached to the mounting bracket before it is screwed on to the cubicle.

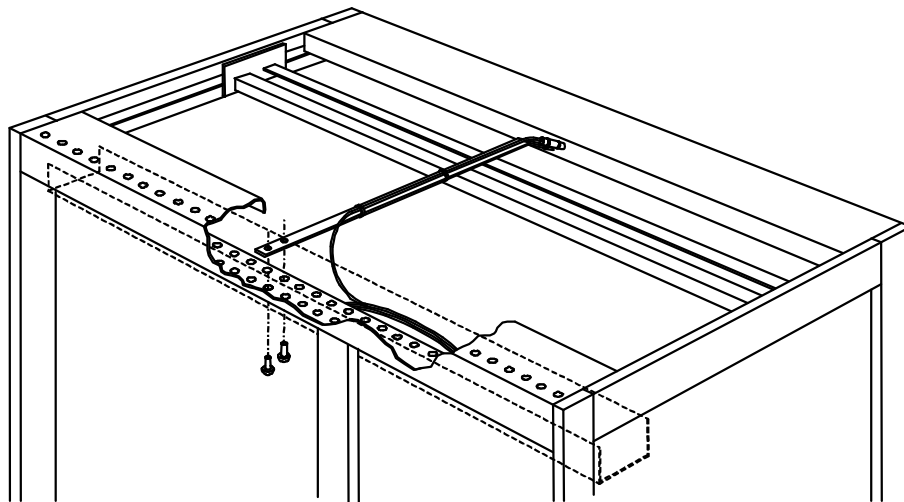


Fig. 1

Mounting bracket

Bracket with Cat. No. 1SFA 663 006R1001 ¹⁾ is intended for cubicle with depth 600 mm. Bracket with Cat. No. 1SFA 663 006R1002 ¹⁾ is intended for cubicle with depth 1000 mm but can be cut to fit depth 800 mm also.

¹⁾ Contains bracket, cable straps and screws.

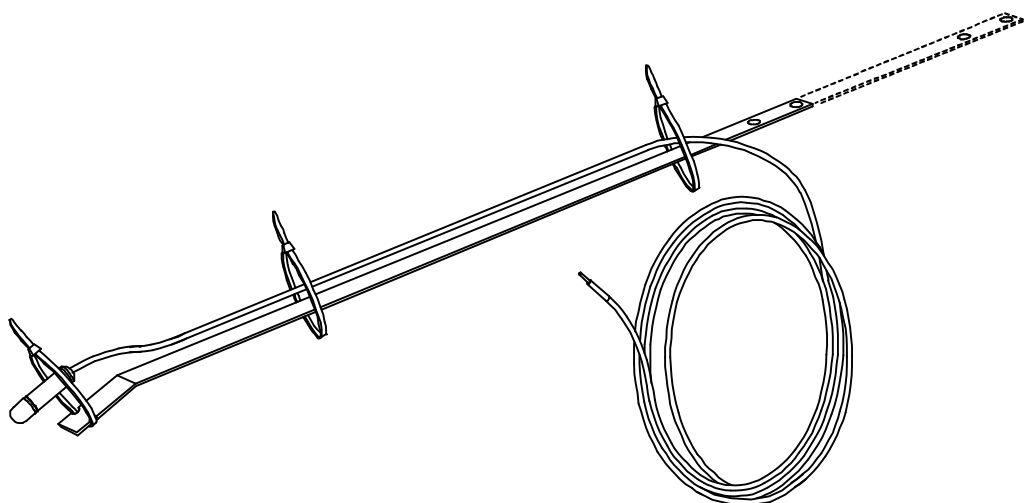


Fig. 2

4 Installation of Arc Guard System in MNS

Location in a circuit-breaker cubicle

In a circuit-breaker cubicle there is a risk of detecting breaking arcs unintentionally, if the detector is placed above the busbars. In such a cubicle it is better to place the detector at the bottom, see fig. 3. The same mounting bracket as for top mounting can be used, but the bend is turned upwards and the detector placed on the upper side. There is a hole (or it has to be drilled, $\varnothing 20\text{mm}$) in the transparent protective sheet in front of the busbars, in which the detector can be located.

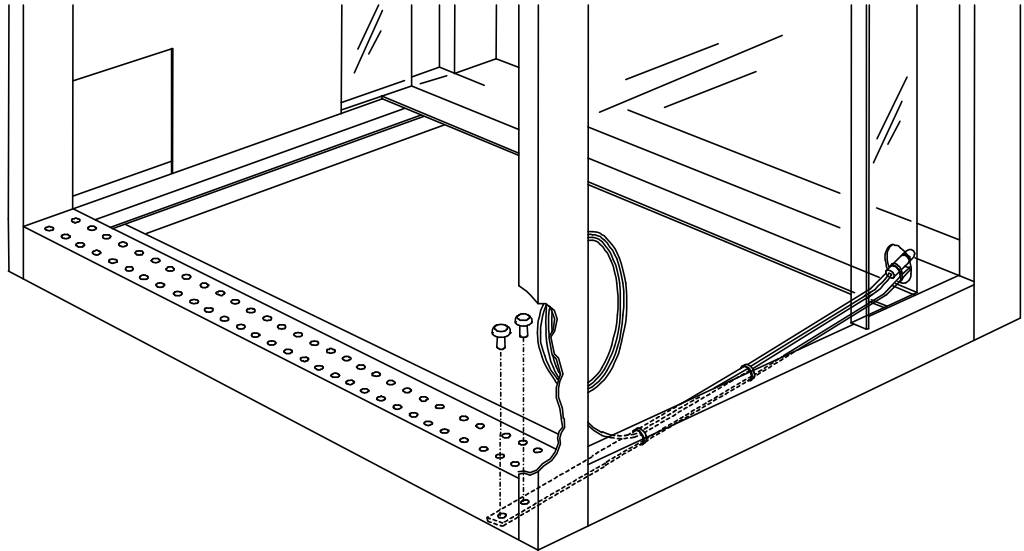


Fig. 3

If many cables are connected to the terminals on the lower side of the circuit-breaker, the arc monitoring should be completed with an additional detector located just behind the front protective sheet, see fig. 4. The detector should be attached to the lower side of the bar behind the protective cover.

The detector bracket 1SFA663006R1001, ...R1002 is not required.

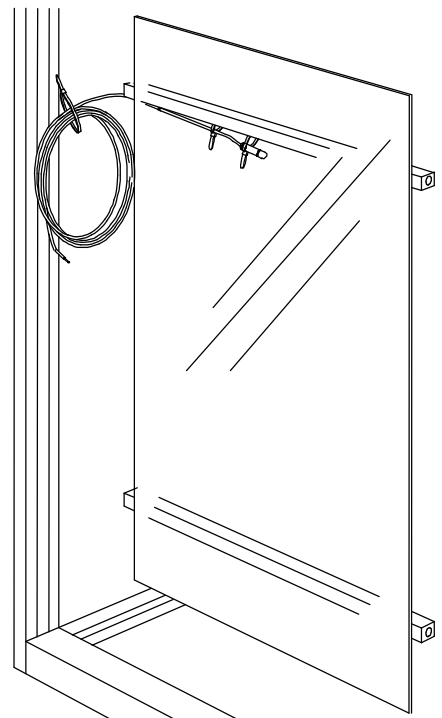


Fig. 4

4 Installation of Arc Guard System in MNS

4.2 Location of units

The Arc Monitors should preferably be placed in a 6-modules fixed apparatus group, where they can be accessed easily. As the viewing angle of the display in the Arc Monitor is very narrow, it is important that they are not placed in the uppermost part of the cubicle.

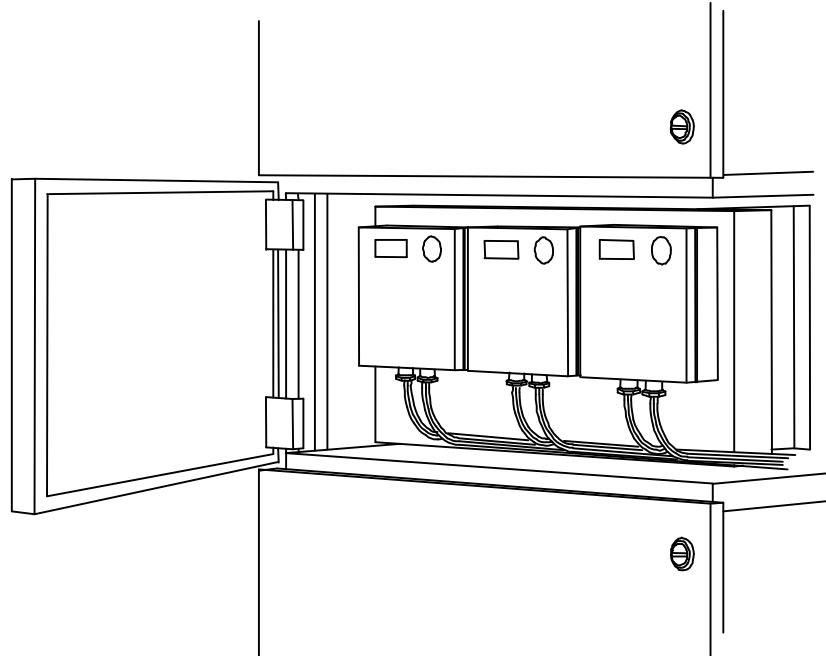


Fig. 5

4.3 Laying of optical fibre cables

Optical fibre cables may be laid together with electrical wires but they are more fragile than such wires. It is very important that the bending radius is larger than the smallest allowable radius. An optical fibre cable must not be exposed to pressure or tensile stress. When fixing the optical fibre cable with cable straps, they must not be tightened so hard that the cable is deformed.

As the optical fibre cables are delivered in fixed lengths, there is often a piece in excess. This should be laid or hung in a ring with a diameter larger than 100 mm. See also paragraph 1.2.

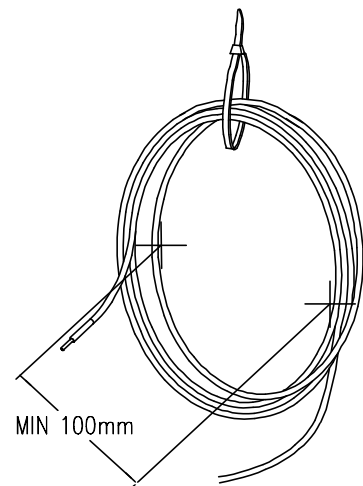


Fig. 6



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