



## 20 - Arc Guard Systems

### Arc Guard Systems.....20.1 - 20.14

#### Selection

Arc Guard System, description.....	20.6
Arc monitor .....	20.2
Current sensing unit.....	20.2
Description, Current sensing unit.....	20.1
Description, Arc monitor .....	20.1
Description, Arc monitor with detectors .....	20.4
Description, Current sensing unit.....	20.5
Detectors with optical plastic cable.....	20.2
Flush mounting set.....	20.3
Information label .....	20.3
Mounting bracket.....	20.3
Mounting kit .....	20.3
Optical plastic cable .....	20.2

#### Circuit diagrams

Arc Guard System application .....	20.11
Arc monitor .....	20.9
Current sensing unit.....	20.10

#### Technical data

Arc monitor .....	20.7
Current sensing unit.....	20.7
Detector and optical fiber cable.....	20.8

#### Dimensions

Arc monitor .....	20.12
Bracket for fiber optic sensors.....	20.12
Current sensing unit.....	20.12
Detector with optical cable .....	20.12
Mounting kit .....	20.13





# Arc monitor • Current sensing unit Arc Guard Systems

## **ABB** Arc Guard Systems Arc monitor Current sensing unit Accessories



### Function

The purpose of the arc guard system is to quickly disconnect the energy source if an arcing fault should occur. The watchful eye of the arc monitor detects any large increase in light intensity. The detector transfers light from the arc through a state-of-the-art solid state electronics package. Within an interval of one to two milliseconds, the detector sends a trip signal to the disconnecting upstream circuit breaker located in the switchgear, bypassing delays caused by the selective features of relaying schemes. This protects your equipment and personnel.

### Current sensing unit

The detectors can also be sensitive to other forms of intense light, such as camera flashes, lightning, direct sunlight, switching arcs in circuit breakers and other large apparatus. By combining the arc monitor with a current sensing unit set just over the normal operating level, a current dependent condition is introduced which prevents triggering from irrelevant light sources. This prevents nuisance tripping the switchgear and causing an unintentional power outage.

### Insensitivity to interference

A switchgear environment is often subjected to extreme electromagnetic interference, especially during an arcing fault. High currents in the busbars and cables, switching arcs in contactors and circuit breakers generate fields that interfere with communication between

relays and meters. Fiber optic cables eliminate the risk of electromagnetic interference. All communication between the detectors, arc monitor and the current sensing unit are through fiber optics. Fiber optic signal transmission makes the systems immune to interference.

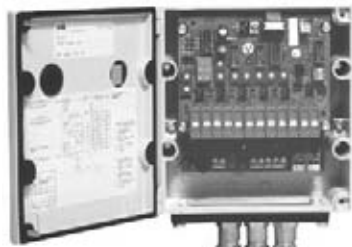
### System security

The arc guard system is a product that seldom (or never!) has to take action, but which must then always operate with absolute dependability. Its performance should be checked after installation and subsequently at certain intervals, e.g. once a year. The design of the system makes it easy to check. The procedure is described in the instructions provided with the equipment.

### Approvals

- Underwriters Laboratories  
File #E155370
- Factory Mutual system  
Reference FMRC J.I. 1B1A4.AF
- Lloyds Register of Shipping  
Cert. #97/00189
- Det Norske Veritas  
Cert. #A-6702
- Germanischer Lloyd  
Cert. #99.342-97
- CE Marked
- Earthquake tested according to ANSI / IEEE  
C37.98 – 1987

# Arc Guard System TVOC



AGS-AM...



AGS-CS240



AGS-DP...



AGS-CP...

## Arc monitor

Power supply voltage	Reference code	Catalog number	List price
60 – 220 VDC and 60 – 240 VAC, 50 – 60 Hz	1SFA 663 001 R1001	AGS-AM240	<b>\$ 3,843</b>
24 – 48 VDC	1SFA 663 001 R1002	AGS-AM48	

Receives the light signal sent by the detector via fiberoptic cables and sends a trip signal to the upstream circuit breaker within 1-2 ms. The DC powered design has reverse polarity protection.

## Arc monitor — simplified version

Power supply voltage	Reference code	Catalog number	List price
60 – 220 VDC and 60 – 240 VAC, 50 – 60 Hz	1SFA 663 001 R1003	AGS-AM240/4	<b>\$ 3,160</b>
24 – 48 VDC	1SFA 663 001 R1004	AGS-AM48/4	

Only 4 detector inputs. Unable to utilize current sensing unit.

## Current sensing unit

Power supply voltage	Reference code	Catalog number	List price
24, 48, 60, 110, 125 and 220 VDC	1SFA 663 002-A	AGS-CS240	<b>\$ 2,452</b>
110 – 125 VAC and 240 VAC, 50 – 60 Hz			

Provides a safeguard against nuisance tripping by requiring both a rapid change in current as well as a signal from the light detector before a trip signal can be transmitted to the upstream circuit.

## Detectors with optical plastic cable

Cable length	Reference code	Catalog number	List price
1m	1SFA 663 003 R1010	AGS-DP1	<b>\$ 197</b>
2m	1SFA 663 003 R1020	AGS-DP2	<b>212</b>
4m	1SFA 663 003 R1040	AGS-DP4	<b>235</b>
6m	1SFA 663 003 R1060	AGS-DP6	<b>260</b>
8m	1SFA 663 003 R1080	AGS-DP8	<b>289</b>
10m	1SFA 663 003 R1100	AGS-DP10	<b>314</b>
15m	1SFA 663 003 R1150	AGS-DP15	<b>381</b>
20m	1SFA 663 003 R1200	AGS-DP20	<b>448</b>
25m	1SFA 663 003 R1250	AGS-DP25	<b>527</b>
30m	1SFA 663 003 R1300	AGS-DP30	<b>591</b>

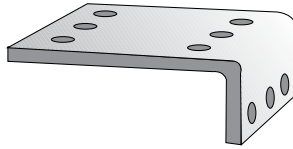
The detectors transfer light from the arc via the fiberoptic cable to the Arc Monitor.

## Optical plastic cable — plastic (provided with plug-in socket terminals)

Cable length	Reference code	Catalog number	List price
0.5m	1SFA 663 004 R1005	AGS-CP5	<b>\$ 84</b>
1m	1SFA 663 004 R1010	AGS-CP1	<b>92</b>
2m	1SFA 663 004 R1020	AGS-CP2	<b>105</b>
4m	1SFA 663 004 R1040	AGS-CP4	<b>134</b>
6m	1SFA 663 004 R1060	AGS-CP6	<b>160</b>
8m	1SFA 663 004 R1080	AGS-CP8	<b>189</b>
10m	1SFA 663 004 R1100	AGS-CP10	<b>214</b>
15m	1SFA 663 004 R1150	AGS-CP15	<b>281</b>
20m	1SFA 663 004 R1200	AGS-CP20	<b>356</b>
25m	1SFA 663 004 R1250	AGS-CP25	<b>437</b>
30m	1SFA 663 004 R1300	AGS-CP30	<b>514</b>

For connection between units:

- Current sensing unit to arc monitor
- Arc monitor to arc monitor
- Current sensing unit to current sensing unit



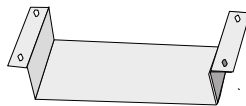
AGS-MB



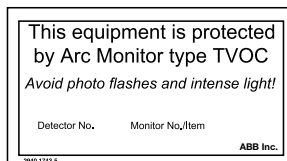
AGS-MK...



AGS-FMS



AGS-FMS



AGS-LABEL

## Mounting bracket

Application	Reference code	Catalog number	List price
For mounting detectors. Detectors are secured to the bracket by means of cable straps.	1SFA 663 006 R1010	AGS-MB	<b>\$ 10</b>

1 Set includes 5 brackets and 10 cable straps.

## Mounting kit

Application (enclosure depth)	Reference code	Catalog number	List price
600 mm	1SFA 663 006 R1001	AGS-MK600	<b>\$ 43</b>
800 – 1000 mm	1SFA 663 006 R1002	AGS-MK1000	<b>52</b>

## Flush mounting set

Application	Reference code	Catalog number	List price
For arc monitor and current sensing unit mounting through the door	1SFA 663 006 R1015	AGS-FMS	<b>\$ 128</b>

Includes mounting bracket, gasket and screws.

## Information label

Description	Reference code	Catalog number	List price
Label to apply to the front of the switchgear cubicle. Text: "This equipment is protected by Arc Monitor Type TVOC"	1SFA 663 005 R1001	AGS-LABEL	<b>\$ 20</b>

1 Set includes 10 pcs.

## 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 NEMA 1 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 but must be used in conjunction with special Arc Monitors.

#### 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 Arc Monitors 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.

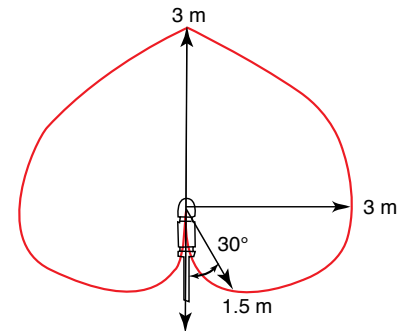
For DC supply, ABB's relay type RXMS (Cat. No. RK 216 263-...) with 4 ms pickup time is suitable. Where a greater load capacity is required this relay can be connected in parallel with relay type RXMH (Cat. No. RK 223 067-...).

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).



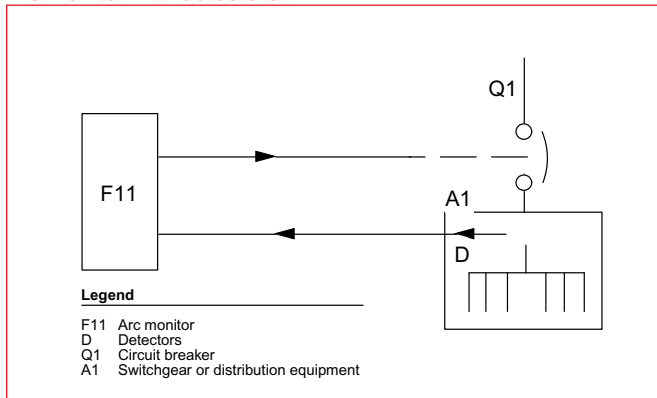
Arc monitor

#### Detection area



Polar diagram of detector in three dimensions

#### Arc monitor with detectors



## Description

### Current sensing unit

Arc Guard  
Systems

#### Description

- Has terminals for a number of different supply voltages.
- Connects to current transformers located at suitable positions in the busbar system of the installation to be monitored.
- The unit incorporates a selector switch and potentiometer for testing and checking purposes.
- Power consumption is approximately 11 W.
- Optical signal transmission
- If several current sensing units are needed, these can be connected in series using optical cables.
- LEDs indicate when the current exceeds approximately 70% and 100% of the set value.

#### Connection to current transformers

The unit is to be connected to current transformers with a rated secondary current of 1, 2 or 5 A.

*Note that current transformers for relay protection are to be used since these do not saturate as quickly as ordinary current transformers. To minimize the operating time, the current transformers should not saturate until twice the set current has been reached.*

The unit can be either 1, 2 or 3-phase connected (to one, two or three current transformers). However, in three-phase systems single-phase connection should be avoided. Even though arcs generally spread to all three phases, valuable time may be lost before the current rises to the trip value if the arc is struck in one of the phases in which the current is not sensed by the unit.

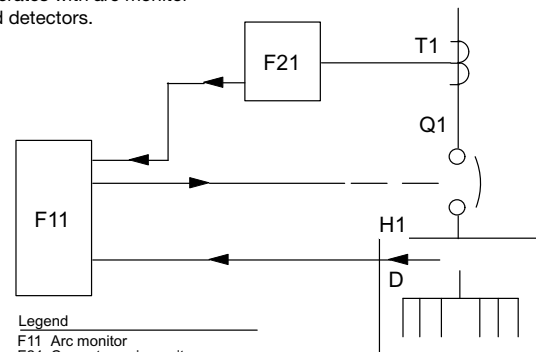
The unit imposes insignificant load on the current transformers, approximately 0.7 VA, so current transformers that are also applied for other purposes can often be used.



Current sensing unit

#### Current sensing unit

Operates with arc monitor and detectors.

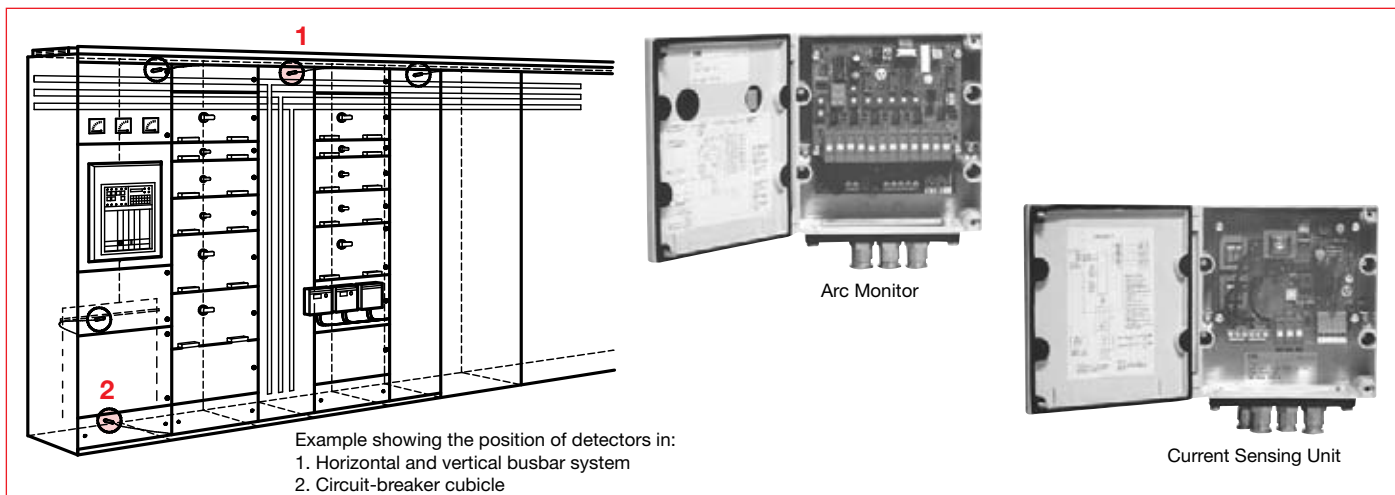


#### Legend

- F11 Arc monitor
- F21 Current sensing unit
- T1 Current transformers, 3 CTs
- Q1 Circuit breaker
- H1 Switchgear or equipment
- D Detectors



## Arc Guard System TVOC Description



### Arc faults

Most short circuit faults in LV and MV switchgears are accompanied by an electric arc. An arc fault always leads to considerable damage to equipment and personnel unless it is distinguished very fast. The fault should be disconnected as fast as possible and in less than 0.1 s to avoid serious damages and give involved person a fair chance to survive the accident without severe damages. This is a demand found in the electrical safety rules in all CE countries, ref. IEC364-4-42.

The Arc Guard System TVOC is an aid to quickly detect an arc fault and trip the incoming circuit-breaker. The main advantage with the Arc Guard System is that it can trip instantaneously, i.e. override other tripping functions.

### Function

The Arc Guard System TVOC is used for high-speed tripping of the main circuit-breaker in the event of an arc fault.

### Arc Monitor with detectors

The unit reacts to short-circuit arcs and immediately transmits a tripping signal.

- A maximum of nine detectors can be connected to each Arc Monitor unit. (Max. four detectors for the simplified version).
- Normally only one detector is required in each compartment
- The Arc Monitor can be located anywhere in the switchgear.
- For practical reasons, the length of the optical fibre cables should be kept to a minimum.

Should an arc occur, the detector concerned transmits the light to the Arc Monitor and a solid state contact in it operates within a millisecond. This contact is connected in series with the shunt release of the circuit-breaker. Even if the over-current release of the circuit-breaker is delayed to provide selectivity, this does not influence the operation of the Arc Monitor.

### Current Sensing Unit

In addition to the light produced by arcs, the Arc Monitor is also sensitive to other sources of intense light such as photo flashes, sunlight directly on the detector, intense lamp light close to a detector or normal arc light from such large items as circuit-breakers. By combining the Arc Monitor with a Current Sensing Unit, a current logic condition is introduced that prevents circuit-breaker tripping by non-relevant light sources.

### EMC feature

The switchgear and controlgear equipment in which the Arc Guard System is intended to be placed generally represents a severe environment in terms of electromagnetic interference. High currents in busbars and cables, switching of inductive loads, arcs from switching equipment etc. generate electromagnetic fields of considerable strength.

Electrical wires act as antennas and pick up electrical interference voltage. By using optical fibres the Arc Monitor installation is not sensitive to electromagnetic interference.

The basic EMC publications IEC 61000 define different electrical environment classes and corresponding test levels. A switchgear is generally regarded as a more severe electrical environment than a typical industrial electrical installation. The Arc Guard System TVOC is tested according to the test level for severe industrial environment or switchgears with mixed signal and power cables.

The Arc Guard System is tested according to following standards:

- IEC 61000-4-2, level 3
- IEC 61000-4-3, level 3
- IEC 61000-4-4, level 4 and corresponding part of SS 436 15 03, PL4
- IEC 61000-4-5, level 4/3
- IEC 61000-4-6, level 3
- IEC 61000-4-11
- IEC 61000-4-12, level 4/3

The Arc Guard System fulfills the requirements for CE-marking according to the EMC-directive 89/336/EEC, tested according to EN 50081-1 and EN 50082-2. The Low Voltage Directive 73/23/EEC. The Arc Guard System is UL Listed.

### System security

The Arc Guard System is a product to ensure highest possible safety level and is expected to operate with absolute dependability. The system is provided with testing functions and it should be checked at regular intervals. The test procedure is described in the instruction manual.

### Description of the Arc Guard System

The two units of the Arc Guard System TVOC, the 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 Monitors and detectors is via optical fibre cables.

The simplified version of the Arc Guard System is specially suited for substations.

Note: The simplified version of the Arc Guard System can not be used with the Current Sensing Unit.



# Technical data

## Arc monitor

### Current sensing unit

#### Arc monitor

Triac outputs (Static outputs)	Disconnectible terminals	
Largest load current:		
Continuously	0.7 A	
For 200 ms	30 A	
Smallest recommended load current (temperature $\geq 25^{\circ}\text{C}$ )	DC	45 mA at stated polarity
	AC	80 mA
(temperature $\geq -25^{\circ}\text{C}$ )	DC	80 mA at stated polarity
Residual current, $I_r$ at 220	VAC at DC	8 mA
		0.5 mA
		The output is connected in parallel with 10 ohm in series with 0.1 $\mu\text{F}$
For other voltages	AC	$I_r = \text{Volts} \times \text{Hz} \times 0.0006 \text{ (mA)}$
Peak withstand voltage	600 V	
Power supply voltage	Max. 250 V	
Signal relay outputs (K1, K2)	AGS-AM...	
	240, 48	240/4, 48/4
Thermal rated current, $I_{th}$	5 A	5 A
Rated operational current, $I_o$		
Utilization category per IEC 947-5-1:		
AC 15 $V_e = 250 \text{ V}$	1.5 A	1.5 A
DC 13 $V_e = 48 \text{ V}$	1.0 A	1.0 A
110 V	0.4 A	0.4 A
220 V	0.2 A	0.2 A
Minimum switching load	5 VDC, 10mA	5 VDC, 10mA
Optical inputs	Quantity	
For light detectors	9	4
From Current Sensing Unit or other Arc Monitor	1	—
Optical outputs		
To another Arc Monitor	1	—
To breaker fault unit	1 Not used	—
Indications		
Operating voltage available	Decimal point on digital display lights up relay K2 energizes.	
Upon tripping	Digital display lights up. The display shows which detector was activated (1 – 9). Relay K1 energizes	
Control devices/settings:		
External (on door)		
Pushbutton		
- Reset button	Manual resetting	
Internal (on the printed circuit board)		
Change-over switch		
- Switching on and off of Current sensing unit	On/Off	
- Manual reset of signal relay	On/Off	
Trimming potentiometers		
- Sensitivity setting	Normally not to be adjusted	
Supply voltage:	See ordering information	
Permitted variation	+/-20 % at DC +/-10 % at AC	
Internal fuse	0.8 A delayed (5 x 20 mm)	
Main fuse	max 10 A fast	
Power consumption	6 W	
Ambient temperature	-25°C thru +55 °C	
Operating times:		
From detection to switched on triac outputs	approximately 1 ms (dependent on light intensity)	
From detection to making relay contact	< 10 ms	
Current conditions from input to output	< 0.3 ms (with 1 m optical cable)	
Degree of protection	NEMA 1 / IP54	
Start-up time for power on	< 50 ms at 60V for AGS-AM240 < 50 ms at 24V for AGS-AM48	

#### Current sensing unit

Rated current		
Reconnectible, for connection of external current transformers with secondary rated current	1, 2 or 5 A	
Load on the external current transformers	0.2 VA connected for 1 A 0.7 VA connected for 5 A	
The current sensing unit withstands a maximum of:		
Continuously	1 x rated current	
For 1 second	15 x rated current	
Optical outputs:		
To arc monitor/current sensing unit	Qty: 2	
Optical inputs:		
From other current sensing unit	Qty: 1	
Indications:		
• Signal to arc monitor or current sensing unit	Green LED lights up for normal current level (< set overcurrent level)	
• Pre-warning	Yellow LED lights up for normal current, switched off at > 70% of set overcurrent level	
• Test position	Red LED	
Control devices/settings: (on the printed circuit board)		
Change-over switch		
Test position	On/Off	
Optical input is used or not	On/Off	
Trimming potentiometers		
Setting of overcurrent level	0.5 – 3.5 x rated current	
Simulation of overcurrent level in test position		
Supply voltage	See ordering information	
Permitted variation	+/-20 % at DC +/-10 % at 110-127 VAC +10 / -15 % at 230 VAC	
Power consumption	1 W at 24 V 11 W at 220 V	
Ambient temperature	-25°C thru + 55 °C	
Operating times		
From overcurrent occurring to actuating optical outputs:		
At currents $\geq 2 \times$ set overcurrent level		
3-phase supply.	< 2 ms	
1-phase supply.	< 8 ms	
Current conditions from optical input to optical outputs	< 0.3 ms	
Degree of protection	NEMA 1 / IP54	
Detector spectrum	400 – 850 nm, short plastic fiber 400 – 720 nm, long plastic fiber	
Interference testing	According to EMC publications IEC1000 and Low Voltage Directive 73/23/EEC, the product is CE-marked.	



# Technical data

## Detector and optical fiber cable

### Detector and optical fiber cable

Ambient temperature	
Continuous	-25...+70 °C
Short-time	-25...+85 °C
Smallest bending radius	
Optical cable of plastic fiber	
after installation	45 mm
while handling	10 mm
Material	
PMMA with a sheath of PE and PVC	

### Terminals

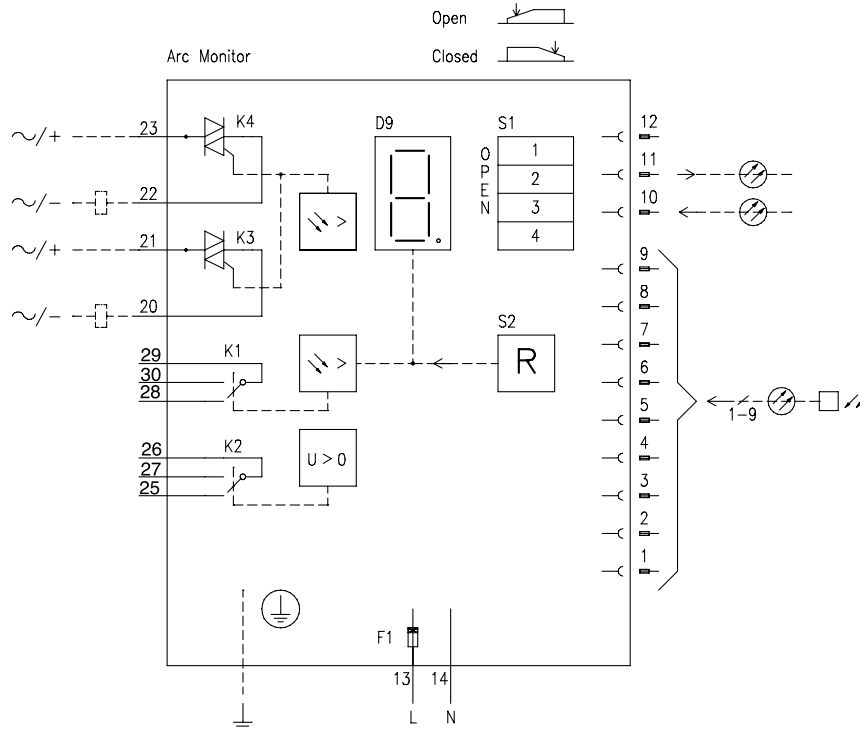
	Terminal	Cross section of connectible cables AWG ① / mm²
Arc monitor	13, 14, 25 – 30 20 – 23	10 / 4 12 / 2.5
Current sensing unit	1 – 6 10 – 14	10 / 4 12 / 2.5

① AWG estimated.

## Circuit diagrams

### Arc monitor

#### Arc monitor (AGS-AM240, AGS-AM48)



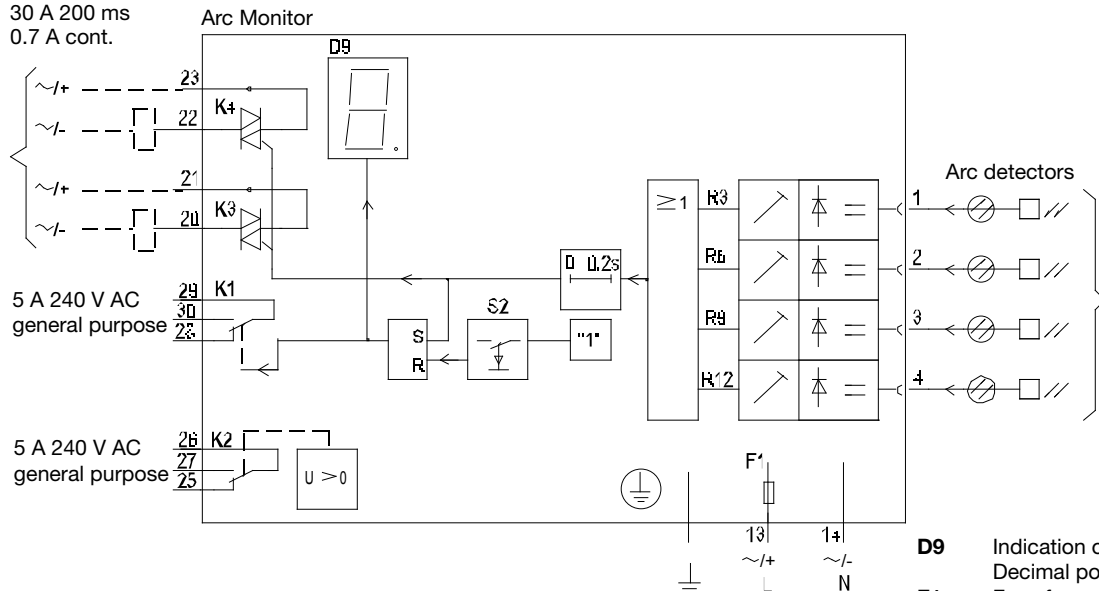
- 1...9** Detector input
- 10** Input current signal from a Current Sensing Unit or another Arc Monitor
- 11** Output current signal to another Arc Monitor
- 12** Not used
- D9** Display for activated detector  
Decimal point lights up during operation.
- F1** Fuse for supply voltage
- K1** Indication Arc Monitor has tripped
- K2** Indication Arc Monitor in operation
- K3, K4** Solid state trip contacts for circuit-breaker
- S1** Switch for:  
1 Closed: Current signal used,  
Open: Current signal not used  
2 Closed: Manual reset K1 (via S2)  
Open: Automatic reset K1 after 200 ms  
3 and 4 Not used
- S2** Manual reset button for K1 and D9

#### Terminals

- 13,14** Power supply
- 20...23** Solid state trip contacts
- 25...30** Indication contacts

#### Arc monitor, simplified version (AGS-AM240/4, AGS-AM48/4)

250 V AC/DC  
30 A 200 ms  
0.7 A cont.



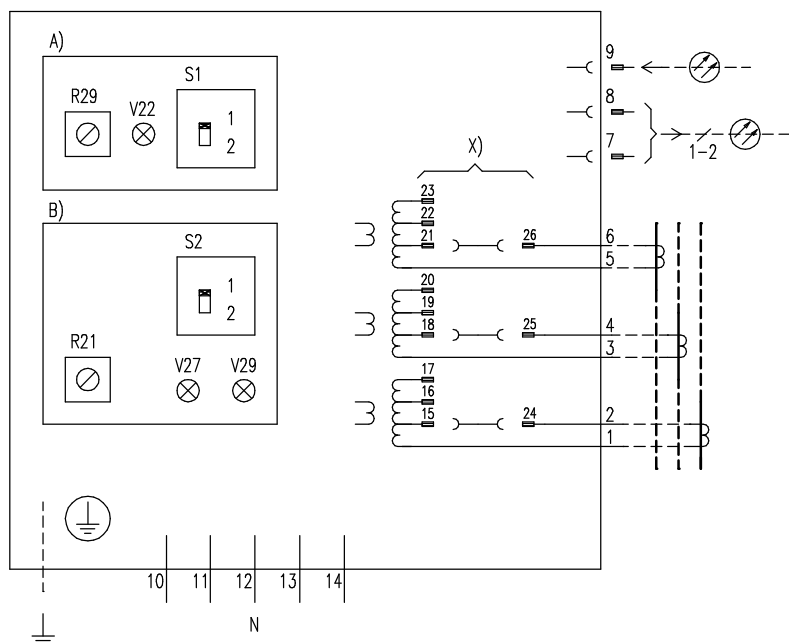
- D9** Indication of activated detector  
Decimal point illuminated at operation
- F1** Fuse for power supply. 0.8 A T
- R...** For adjustment of sensitivity
- S2** Reset button
- K1** Relay for trip indication
- K2** Relay for in service indication
- K3, K4** Solid state contacts (triacs) for tripping circuit-breakers

## Circuit diagrams

### Current sensing unit

### Arc Guard System with two separated circuit breakers

#### Current sensing unit (AGS-CS240)



#### Power supply terminals

<b>10 and 12</b>	24 V DC
<b>11 and 12</b>	60 V DC
<b>11 and 12</b>	48 V DC Interconnection 11-13
<b>13 and 12</b>	110 V-125 V AC/DC
<b>14 and 12</b>	220 V DC, 230 V AC

#### A) Testing facilities:

<b>R29</b>	Simulating a test current
<b>S1</b>	1 = Test position 2 = Operation position
<b>V22</b>	Red ON = S1 in test position OFF = S1 in operation position

#### B) Setting facilities:

<b>R21</b>	Overcurrent setting
<b>S2</b>	1 = Input 9 not used 2 = Input 9 used
<b>V27</b>	Yellow ON = Load current less than 70% of set overcurrent level OFF = Load current more than 70% of overcurrent level
<b>V29</b>	Green ON = Load current less than set overcurrent level OFF = Load current more than set overcurrent level

#### X) Current range bridge connections:

<b>1A:</b>	24-17, 25-20, 26-23
<b>2A:</b>	24-16, 25-19, 26-22
<b>5A:</b>	24-15, 25-18, 26-21 On delivery

#### Terminals

<b>1...6</b>	Current transformer terminals
<b>7...8</b>	Output current signal to another Current Sensing Unit or Arc Monitor
<b>9</b>	Input current signal from another Current Sensing Unit

#### Arc Guard System with two separated circuit breakers (Suitable for AGS-AM240, AGS-AM48)

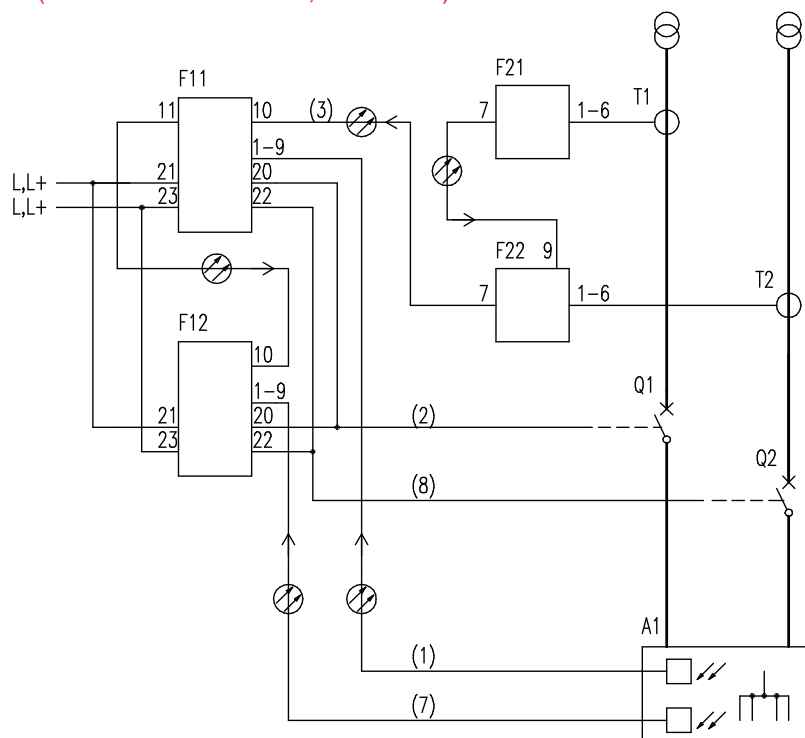
#### Parallel connection of Arc Monitors

In installations with more than one Arc Monitor. Current sensing function is transmitted to next Arc Monitor via fibre cable (4).

#### Several Current Sensing Units

The Arc Monitor can be linked with several Current Sensing Units by connecting the Current Sensing Units in series.

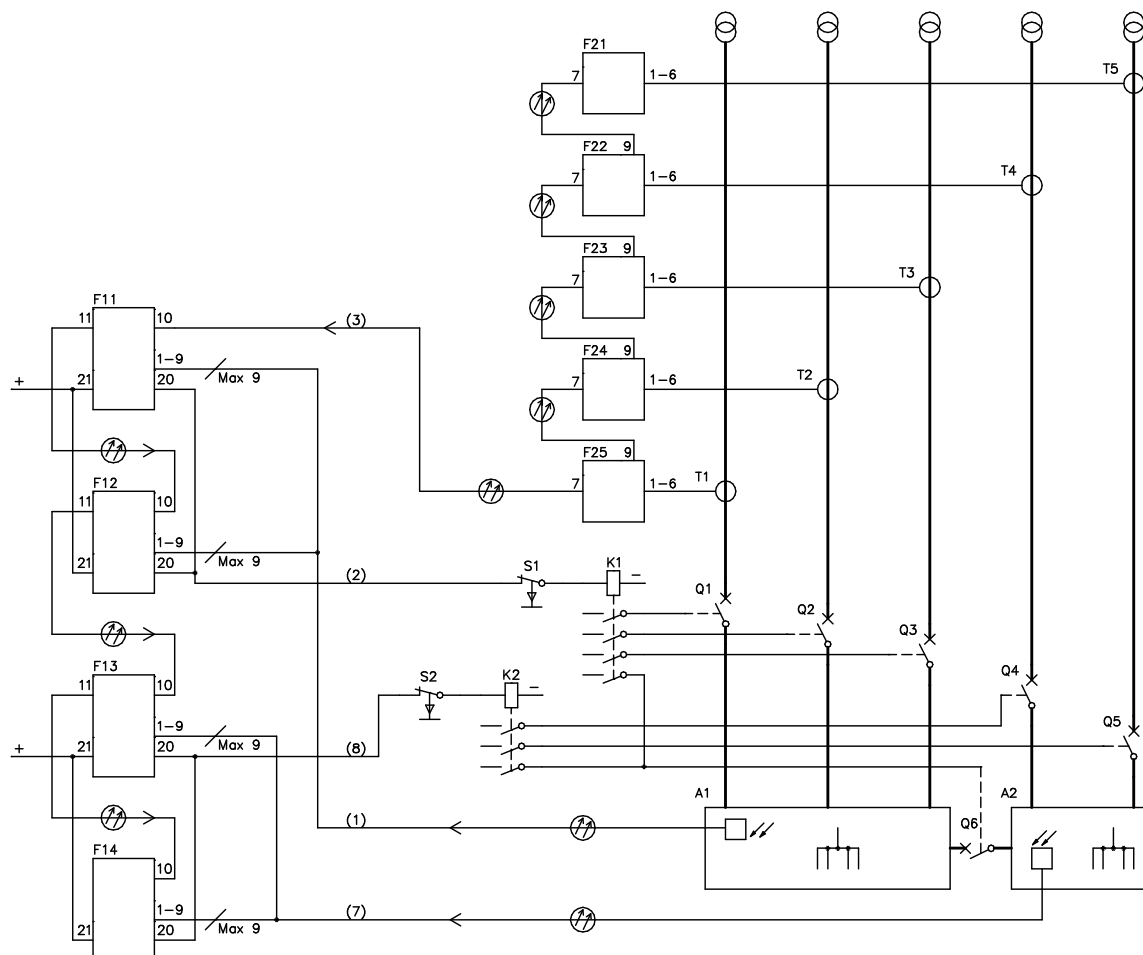
<b>A1</b>	Switchgear or similar
<b>F11, F12</b>	Arc Monitor
<b>F21, F22</b>	Current Sensing Unit
<b>Q1, Q2</b>	Circuit-breaker
<b>T1, T2</b>	Current transformers
<b>(1), (7)</b>	Detector cables (optical fibre cable)
<b>(2), (8)</b>	Trip circuit for circuit-breaker (electric cable, separately powered)
<b>(3)</b>	Current signal to Arc Monitor (optical fibre cable)
<b>(4)</b>	Current signal is transmitted to second Arc Monitor via optical cable



## Circuit diagrams

### Arc Guard System application

#### Arc Guard System with current measuring in five incoming feeders (Suitable for AGS-AM240, AGS-AM48)



**A1, A2** Switchgear or similar  
**F11...F15** Arc Monitor  
**F21...F25** Current Sensing Unit  
**K1, K2** Fast tripping relay  
**T1...T5** Current transformers  
**Q1...Q5** Circuit-breaker  
**Q6** Bus coupler

**(1), (7)** Detector cables (optical fibre)  
**(2), (8)** Trip circuit for circuit-breaker  
 (electric cable, separately powered)  
**(3)** Current signal to Arc Monitor  
 (optical fibre cable)

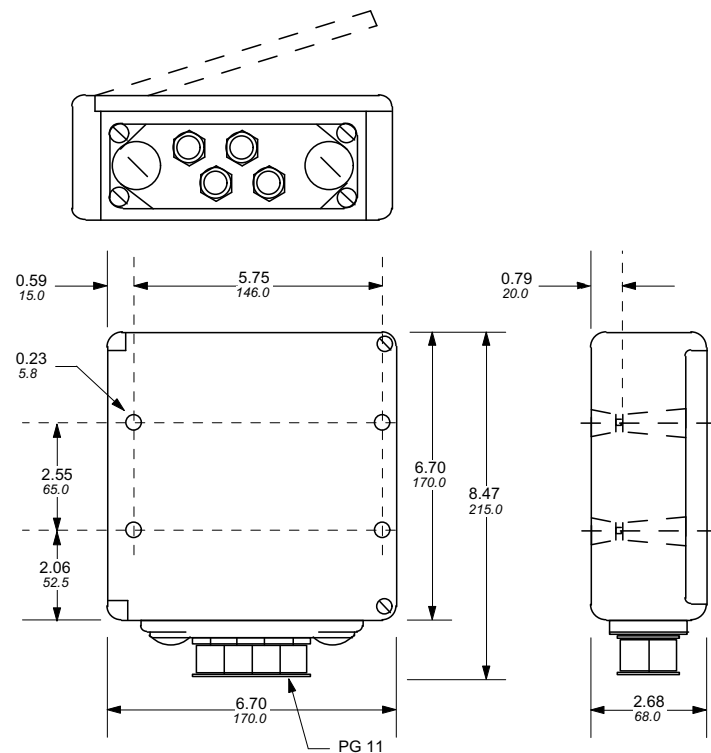
## Approximate dimensions Arc Guard System

00.00 00.00 Inches  
[Millimeters]

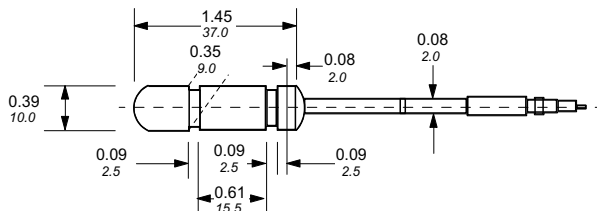
### Arc monitor

#### Current sensing unit

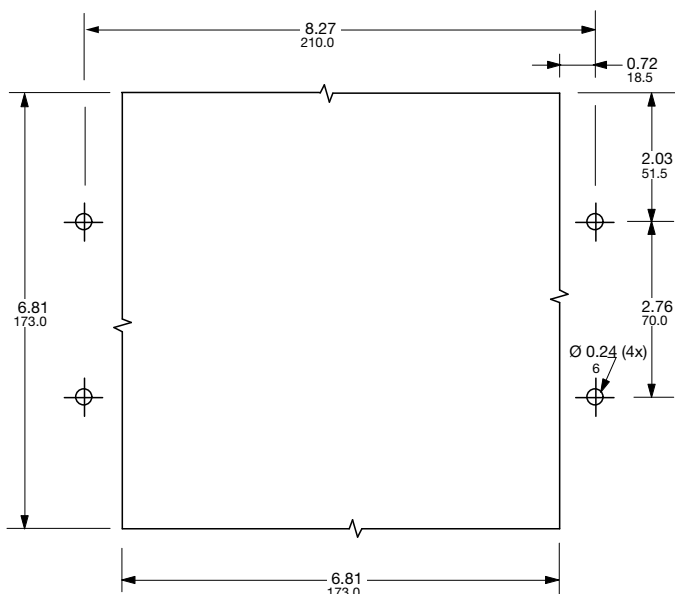
A flange with 6 tapped holes (size 18.6 mm) 4 cable glands (sealing diameter 5.5 – 8.5 mm) and 2 plastic blank plugs are supplied.



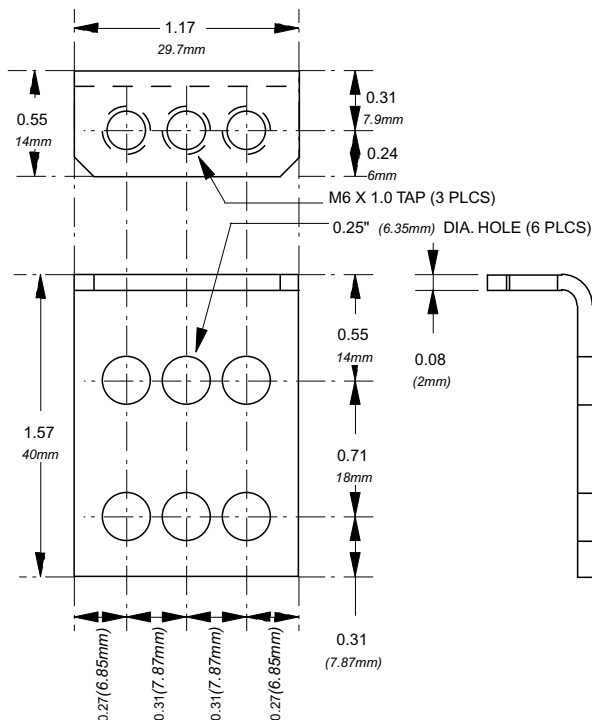
### Detector with optical cable



### Front panel cut-out for flush mounting set



### Bracket for fiber optic sensors



# Approximate dimensions Arc Guard System

Arc Guard  
Systems

00.00 → Inches  
00.00 → [Millimeters]

## Mounting kit

