

# INSTRUCTION BOOKLET AQ0x

## Arc Sensors



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# 1 ARC SENSORS

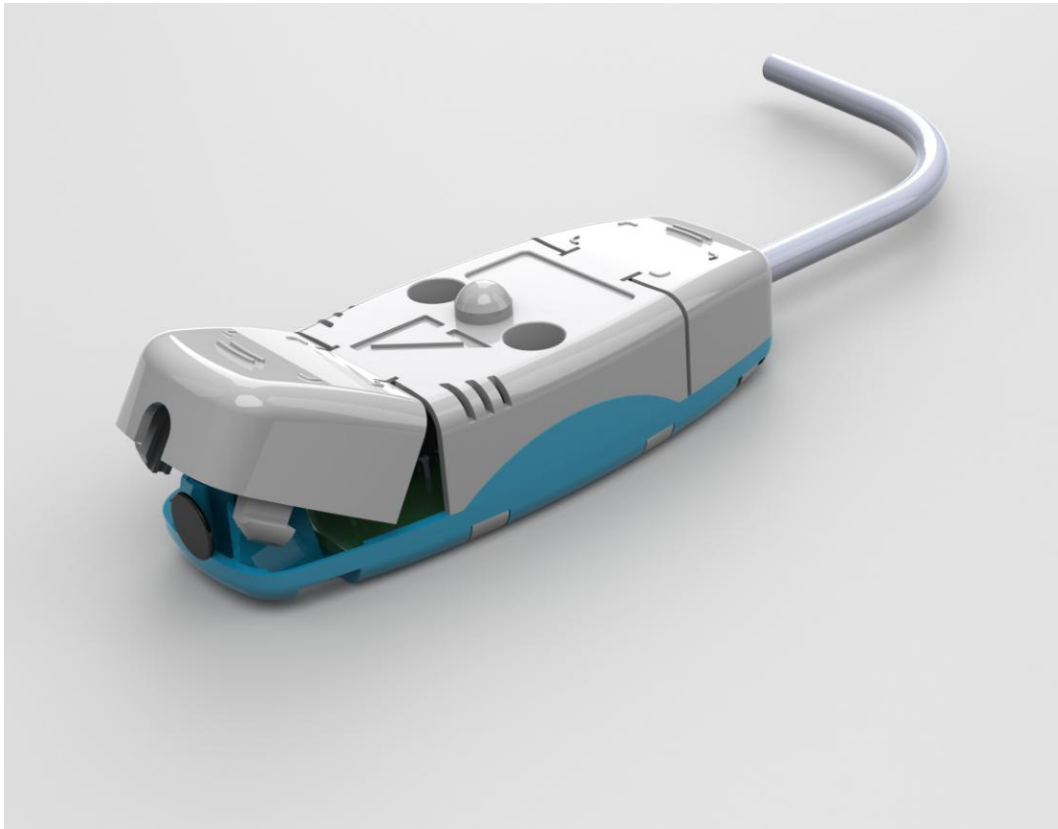
AQ 100 series provides choice of different types of arc sensors to be utilized in different units and different switchgear types according to specific application requirements. Available sensor types are arc light point sensors and arc light fiber optic loop sensors.

Arc light point sensors are typically installed in metal clad compartments providing quick accurate location of the faulted area. Arc light fiber loop sensors are installed typically to cover a wider protected area with one fiber when no need for more exact fault location exists.

## 1.1 ARC LIGHT POINT SENSOR AQ 01

AQ 01 is an arc light point sensor with a light sensitive photodiode element activated by arc light. AQ01 arc sensors should be mounted in the switchgear cubicles in such a way that the light sensitive part covers the protected area as completely as possible. One sensor per closed metal clad compartment should be utilized. In open spaces, such as the bus bar section, arc sensors should be mounted maximum 2 meters apart.

The fixed light sensitivity of the AQ01 sensor is 8000 Lux. Sensor does not require user settings. Detection radius is 180 degrees.



*Figure 1-1: Arc sensor AQ 01*

### 1.1.1 AQ 01 INSTALLATION AND WIRING

AQ 01 is installed either on the compartment wall or through wall. Example of wall mounting is seen in Figure 1-2. AQ 01 is fixed to the wall using two screws. The same screw pattern is utilized in through wall mounting arrangement as well. Unit is turned around and the eye is pushed to the compartment to be protected and two screws are attached from the back side of the sensor. No external mounting plates are needed in any case.



*Figure 1-2: AQ 01 mounted to compartment wall.*

AQ01 comes without connection cable. Connection cable installation at site is simple. Cable connectors are located beneath the covers that can be conveniently detached for fastening the sensor wires. Cover shall be attached after installing the wires. Cable connectors are located at both ends of the sensor for series connecting maximum three sensors in one line. See figure Figure 1-1.

### 1.1.2 AQ 01 TECHNICAL DATA

Light intensity threshold	8000Lux
Detection radius	180 degrees
Mechanical protection	IP 64
Sensor wiring arrangement	2 wires and shield
Sensor cable specification	Shielded twisted pair 0.75mm <sup>2</sup>
Maximum sensor cable length per sensor channel	100 meters
Operating temperature	-20...+85 ° C

## 1.2 ARC LIGHT FIBER OPTIC LOOP SENSOR AQ 06

AQ 06 is an arc light fiber optic loop sensor. AQ 06 fiber is a plastic fiber optic cable. AQ 06 sensors can be ordered in pre-manufactured lengths of 1-40 meters. AQ 06 fiber sensors are distributed through the protected switchgear cells. AQ 06 is not recommended to be cut and/or spliced on site. If cutting/splicing is necessary due to accidental breakage please contact your nearest Arcteq representative.

The fixed light sensitivity of the AQ06 sensor is 8000 LUX. Sensor does not require user settings. Detection radius is 360 degrees.

Note: On request AQ 06 ends can be covered with black rubber part for any requested portion to avoid light detection outside the protected zone. For more information consult your nearest Arcteq representative.

### 1.2.1 AQ 06 TECHNICAL DATA

Light intensity threshold	8000Lux
Detection radius	360 degrees
Maximum length	40 meters
Diameter	1 millimeter
Bending radius	5 centimeters
Operating temperature	-10...+85° C

## 1.3 ARC LIGHT FIBER OPTIC LOOP SENSOR AQ 07

AQ 07 is an arc light fiber optic loop sensor. AQ 07 fiber is a robust fiber optic cable providing practically limited bending radius. AQ 07 contains hundreds of glass fiber drains covered by a plastic tube making it extremely strong. AQ 07 sensors can be ordered in pre-manufactured lengths of 1-50 meters. AQ 07 fiber sensors are distributed through the protected switchgear cells. AQ 07 is not recommended to be cut and/or spliced on site. If cutting/splicing is necessary due to accidental breakage please contact your nearest Arcteq representative.

The fixed light sensitivity of the AQ07 sensor is 8000 LUX. Sensor does not require user settings. Detection radius is 360 degrees.

Note: On request AQ 07 ends can be covered with black rubber part for any requested portion to avoid light detection outside the protected zone. For more information consult your nearest Arcteq representative.

### 1.3.1 AQ 07 TECHNICAL DATA

Light intensity threshold	8000Lux
Detection radius	360 degrees
Maximum length	50 meters
Diameter	1.2 millimeters
Bending radius	1 centimeter
Operating temperature	-40...+85° C



## 1.4 ARC LIGHT FIBER OPTIC LOOP SENSOR AQ 08

AQ 08 is an arc light fiber optic loop sensor. It is developed to withstand temperatures of up to 125 degrees Celsius and is therefore suitable for installation in e.g. wind turbine windings. AQ 08 fiber is a robust fiber optic cable providing practically unlimited bending radius. AQ 08 contains hundreds of glass fiber drains covered by a plastic tube making it extremely strong. AQ 08 sensors can be ordered in pre-manufactured lengths of 1-40 meters. AQ 08 fiber sensors are distributed through the protected switchgear cells. AQ 08 is not recommended to be cut and/or spliced on site. If cutting/splicing is necessary due to accidental breakage please contact your nearest Arcteq representative.

The fixed light sensitivity of the AQ08 sensor is 8000 LUX. Sensor does not require user settings. Detection radius is 360 degrees.

Note: On request AQ 08 ends can be covered with black rubber part for any requested portion to avoid light detection outside the protected zone. For more information consult your nearest Arcteq representative.

### 1.4.1 AQ 08 TECHNICAL DATA

Light intensity threshold	8000Lux
Detection radius	360 degrees
Maximum length	40 meters
Diameter	1.2 millimeters
Bending radius	1 centimeter
Operating temperature	-40...+125° C

## 1.5 SENSOR TYPE DEPENDENCIES

Different sensor types can be utilized in different arc flash protection units of the AQ 100 series. The table below describes the dependencies.

Table 1-1: Arc sensor dependencies

	AQ 01	AQ06	AQ07	AQ08
AQ101	Yes	Yes (with fiber option)	Yes (with fiber option)	Yes (with fiber option)
AQ102	No	Yes	Yes	Yes
AQ110P	Yes	Yes (with fiber option)	Yes (with fiber option)	Yes (with fiber option)
AQ110F	No	Yes	Yes	Yes