

# Arc Flash Protective Relay

## Installation Instruction



**Version:1.0**

**Revision 2023.04**

## **1. Preparation before installation**

### **1. Determining the installation position and on-site inspection**

According to the project configuration, check the geographical distribution of the switchgear, and determine the installation positions of the host, CT, and optical fiber. It is usually installed in the busbar PT cabinet or excitation PT cabinet with sufficient space. During the on-site inspection, it is required to check to prevent other items from occupying the space.

### **2. Determining the path of the arc probe fiber**

The busbar is located in the later part of the switchgear, and the optical fiber needs to pass through the front half to connect to the host. It needs to drill holes on the bulkhead to pass through the optical fiber, and connect to the secondary wiring hole/bus duct on the top of the switchgear to the host.

### **3. Using PVC pipe to protect the optical fiber**

If the switchgear is divided into two rows, some optical fibers need to be connected to the host through the cable trench. To protect these fibers, use PVC pipe to pass them through. Therefore, it is necessary to prepare a suitable PVC pipe as a fiber optic conduit.

### **4. Measuring fiber lengths and determine required quantities**

After determining the positions of the host, CT, and optical fiber, it needs to measure the length of the optical fiber from each arc starting probe to the host and summarize the number of required fibers. When repairing on site, it needs to bring the correct amount of fiber.

### **5. Planning current CT wiring mode**

Planning the current CT wiring method before construction, including using a group of CTs alone or using a group of CTs in series with other protection CTs.

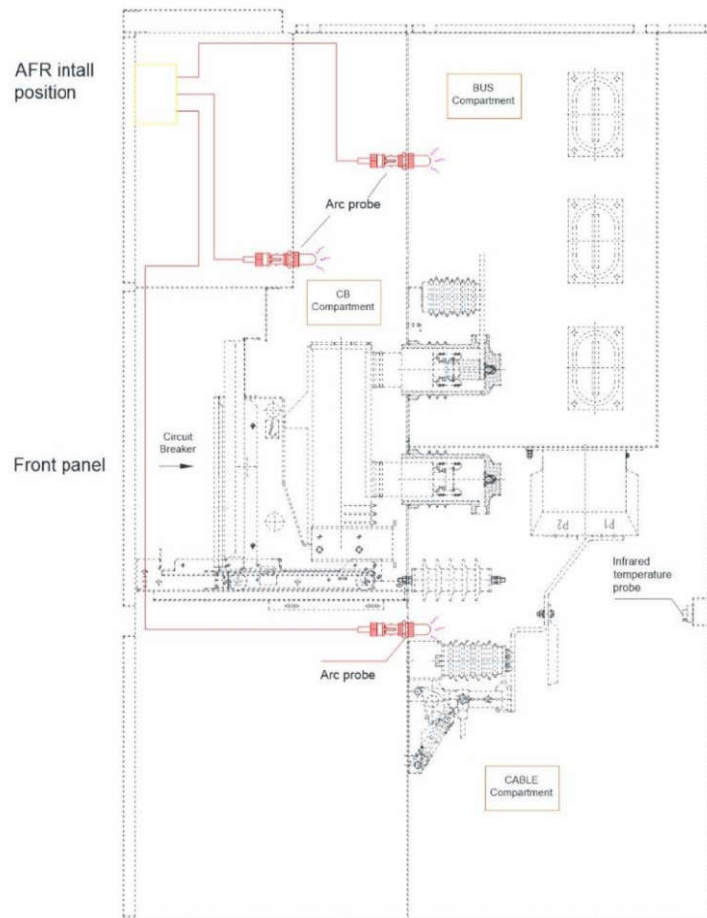
### **6. Preparing the list of items for installation**

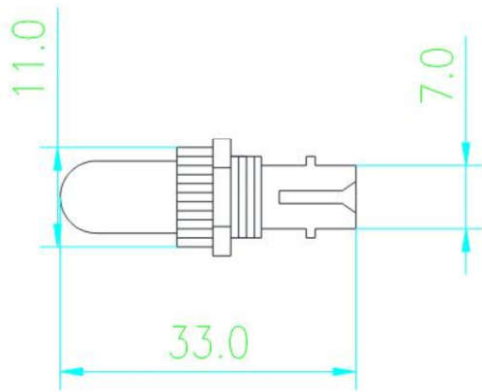
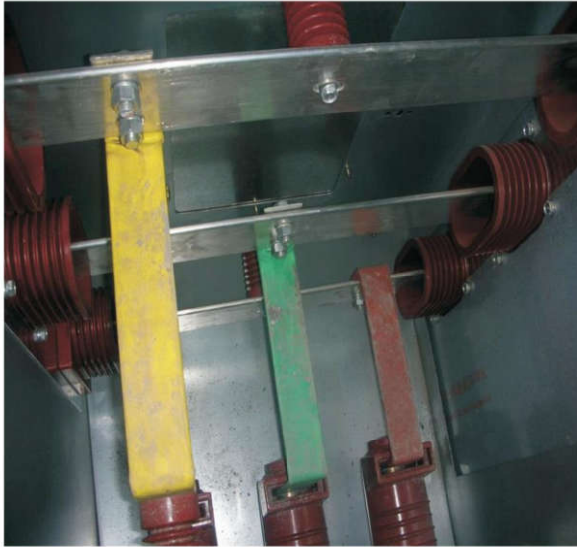
Screws, nuts, gaskets and shrapnel needed to fix the probe bracket; cable ties needed to tie the optical fiber; positioning pieces needed to fix the optical fiber; PVC pipes required for laying the optical fiber; tightening screws The required wrench and pliers; and the three tools needed to make fiber optic splices (wire strippers, crimping pliers, and cutting pliers). In addition, you need to prepare the flash and its charger as experimental supplies.

## 2. On-site installation

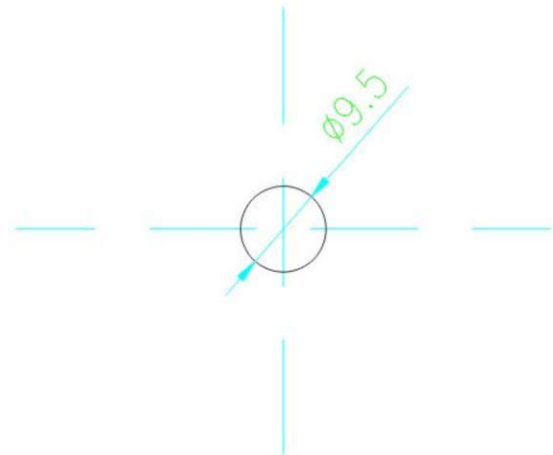
### 1. Arc light probe installation principles

The installation principle of the arc light probe is to make the busbar in the switchgear completely within its monitoring range, preferably placed in the upper left corner or upper right corner facing the busbar. Refer to the figure below, the left picture is the busbar in the switchgear, and the right picture is the arc probe placed in the upper right corner of the switchgear.





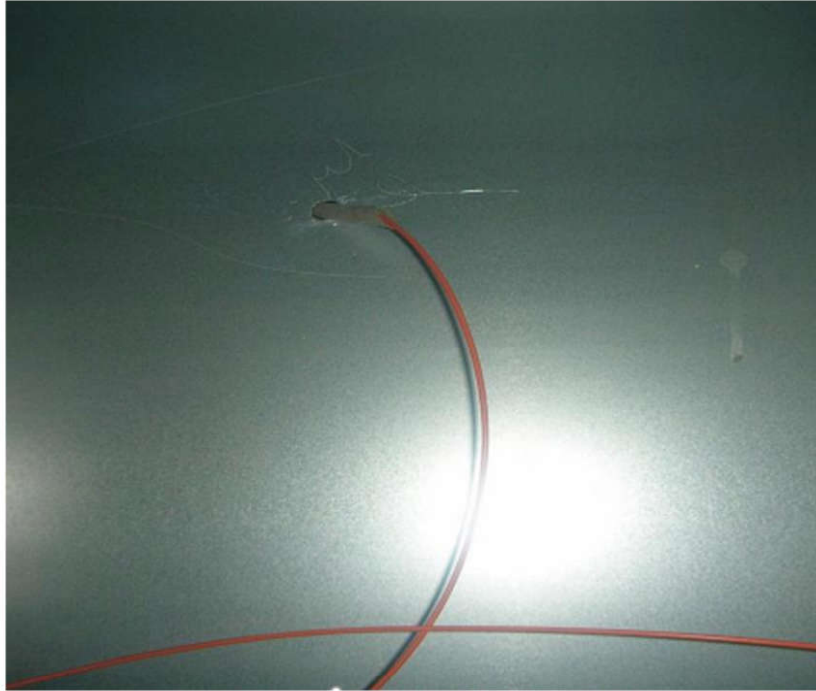
Probe head



Hole size

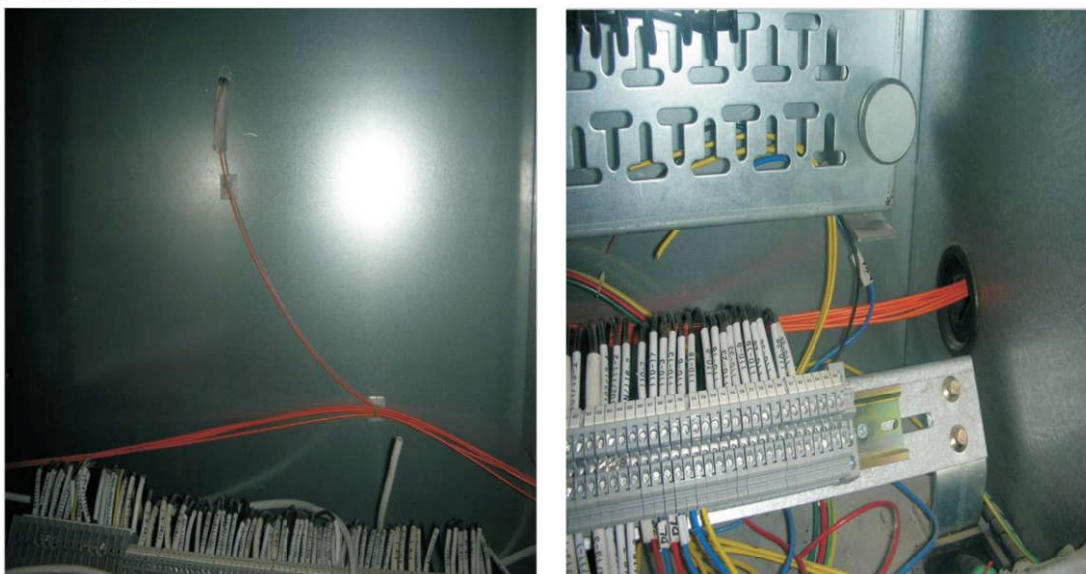
## 2. Steps and Precautions for Installing Optical Fiber on the Switchgear

Open front door of switchgear, use electric drill to bore hole in front partition for optical fiber. Hole may be rough and have burrs when fiber passes through. To prevent damage to fiber's outer skin, use combustion casing with resistance. See figure below for details.



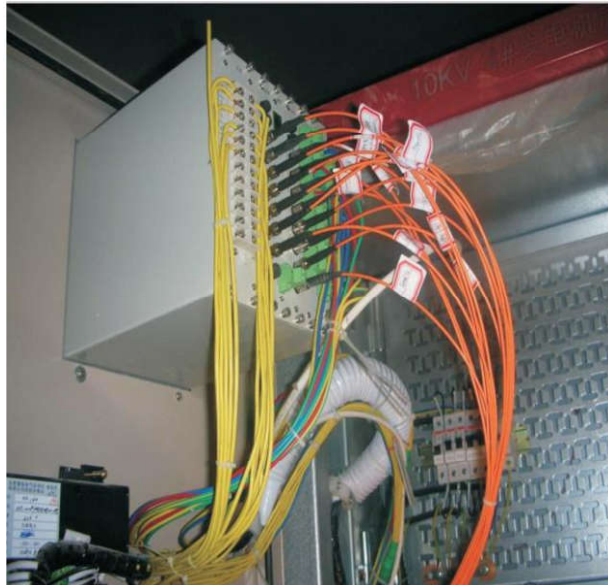
## 3. Optical fiber bundling method and schematic diagram for connecting the probe

All the optical fibers connected to the probe must be bundled neatly, pass through the wiring holes in turn, and finally connected to the master control unit or arc unit. The following two pictures are for reference.



#### 4. Optical fiber numbering principles

Each optical fiber needs to be numbered, usually based on the number of the switchgear or the method of describing the position of the probe. After numbering, use label paper or numbering tubes to stick (or wrap) on the optical fiber. In this way, when the arc protection is activated, we can quickly lock the specific switchgear according to the probe address reported by the device, and quickly find out the fault location.



## 5. Probe Installation for Connecting Busbars

Sometimes due to space constraints, the busbars need to be divided into 2 rows, so there must be connecting busbars above the 2-section busbars, and probes need to be installed here. Usually, 2 contrasting probes can be installed at both ends of the busbars. See the following figure for details.

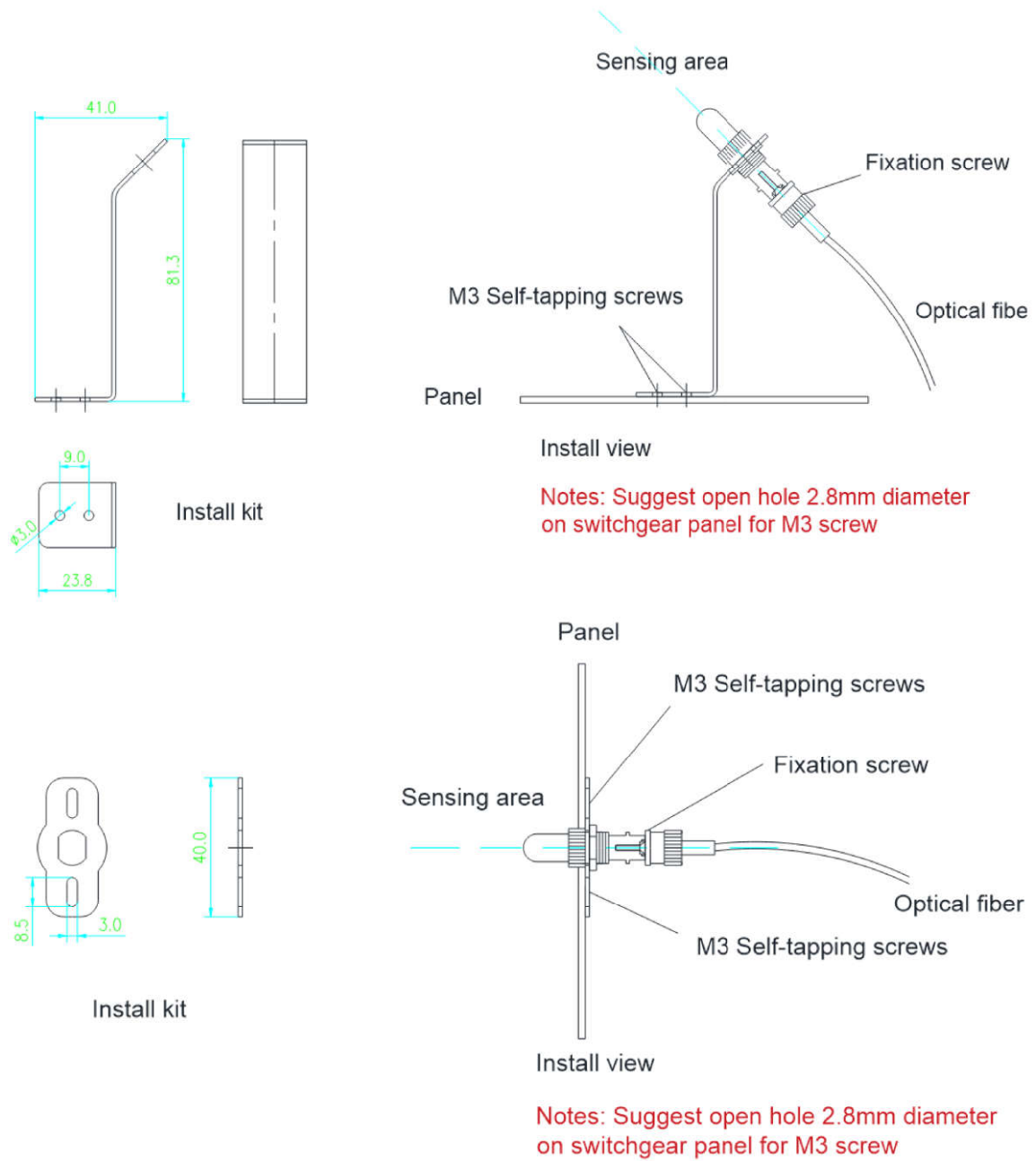


## 6. Tips and Considerations for Installing Probes

When installing the probe, if the space of the connection cabinet is small, the installation location should be reasonably selected, and the probe should be kept away from the busbar as far as possible, and the search angle should be maximized. Use switchgear screw holes instead of cutouts. The optical fiber routing should also follow the trend. If there is a small hole at the corner to facilitate the passage of the optical fiber, there is no need to open another hole.



**Panel installation method and size (unit: mm)**





## 7. Fiber laying skills

The optical fiber needs to be protected in a PVC pipe through the cable trench, and the corner is connected with a hose. See Figure below.

