

## Application Note No. 008

# Cause analysis of DC wiring failure

### Version History

- Version 01 (2020-07-19)

Initial Release

### 1. DC Connectors of different brands are plugged into each other

Although different brands of DC connectors look similar in appearance, they can also be connected each other during installation. However, but due to the inconsistencies in the specifications of the external packaging of different terminals, the specifications of internal conductors, dimensions and tolerances; if two different brands of terminals are mixed to be used, it will cause the contact resistance of the connector increases, the temperature increases, and the IP rating decreases during the inverter running; and meantime heat generation and the decrease of insulation resistance will directly cause the temperature of the connector to rise during inverter running, accelerate the aging of the plastic and even catch fire.



### 2. Terminal core does not match

In the male and female heads of the MC4 DC connector, there is no matching terminal core (that is, the male and female heads are both same type pins), resulting in unreliable connection in the DC connector, and the contact resistance is very large. The core heat increased significantly and burned the terminals.



### 3. Irregular crimp

Poor crimp quality of connectors is another common problem. Due to the difference between the tools used on site and the operating experience, the crimping quality is poor. The most common situation is that the cable copper wire is bent, part of the copper wire is not crimped in, and the crimped part is the cable insulation layer.



### 4. The terminal is not connected tightly

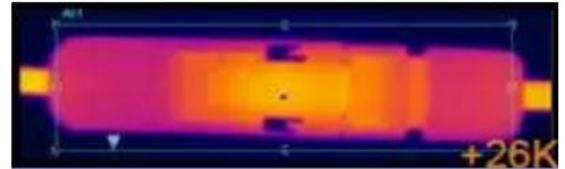
When the male connector and the female connector are connected, if the installer does not hear a "click" sound, it means that the male connector and the female connector are not reliably connected. This will lead to the following situations:

a) The string is open, no current is input into the inverter in the string, and the utilization rate of the PV module is low, resulting in low power generation efficiency of the system;



The terminals are not connected tightly

b) The contact resistance is very large, and there is a significant heating effect after passing the current, and the temperature rise causes the terminal to burn out;



## 5. DC Connector floating

The connector is suspended in the air for a long time, and it shakes due to the influence of wind, which may cause damage to the shell. If the early plug connection is not tight, it is easy to disconnect and fall off. The common solution is to fix the connector on the bracket or component backplane.



## 6. Wiring

Irregular wiring will cause a large force between the connector and the cable, which may easily cause breakage or seal failure during long-term operation. The common solution is to lengthen the wiring slightly to ensure that the 20 mm cable from the cable seal is not bent or compressed.





### Conclusion:

In the construction process of the power station, it is very important to do the wiring of the DC cables. It is related to the quality and benefit of the entire power station, and it also determines the workload of the later power station operation and maintenance. In the construction process, pay attention to control the construction process to avoid the above six situations. Don't sacrifice the quality of the project due to the tight schedule, and the gain will not be worth the loss.