



## H4 Plus™ Cu-Al PV Connectors

### BACKGROUND

In solar photovoltaic (PV) installations, copper cables have been the industry standard due to their superior conductivity and longevity. However, the increasing price of copper presents significant cost challenges for large-scale solar projects. Aluminum cables offer a cost-effective alternative, with lower material costs and easier handling due to their lighter weight. Historically, the challenge has been integrating aluminum cables into systems designed for copper conductors, as the two metals behave differently under electrical load and environmental conditions. To address this, Amphenol Industrial Operations (AIO) has introduced the H4 Plus™ Cu-Al PV connector, which enables seamless connections between copper and aluminum cables without compromising on performance or reliability.

### PROBLEM

The adoption of aluminum cables in solar projects, while cost-effective, presents a technical hurdle: aluminum's propensity to oxidize and its lower conductivity compared to copper. When aluminum is used in systems designed for copper, it can lead to increased resistance at connection points, resulting in heat buildup, energy loss, and potential safety hazards such as hotspots. Additionally, the different thermal expansion rates between copper and aluminum create mechanical stress in the connections, which can lead to degradation over time. Solar operators, therefore, need a reliable connector solution that can manage the unique properties of aluminum cables while maintaining system performance and safety.

### AIO SOLUTION

Amphenol's H4 Plus™ Cu-Al PV connectors provide an advanced solution for integrating aluminum cables into photovoltaic systems. These connectors are specifically engineered to join copper and aluminum cables, addressing the conductivity and thermal challenges of mixed metal connections in solar installations.

The H4 Plus™ connectors are designed for compatibility with both copper and aluminum conductors, minimizing contact resistance and reducing the risk of thermal hotspots. By optimizing the electrical interface, they ensure efficient current flow while mitigating power loss and heat generation at connection points, crucial for maintaining system performance and longevity.

Engineered for harsh environments, these connectors are built to withstand UV exposure, extreme temperatures, and moisture, ensuring reliable operation in outdoor solar applications. The tool-free installation design incorporates a secure locking mechanism, which enhances installation speed and reduces labor time without compromising connection integrity.

By employing H4 Plus™ Cu-Al connectors, solar systems can safely and efficiently integrate aluminum cables, capitalizing on material cost savings without sacrificing electrical performance, safety, or long-term durability.