Important Note on Product Liability | Standards and Regulatory Compliance

Safety Risk of mating PV Connectors from different Manufacturers within a PV system

TO WHOM IT MAY CONCERN

Dear valued customer

The worldwide acceptance of Photovoltaics (PV) is based on the industry's cost-efficient, reliable and proven safe method for generating clean energy. Within a PV system, PV electrical connectors are key components for ensuring a long-term stable, predictable and dependable electrical and mechanical operation. The transmission of electrical power through the PV connector must happen in a manner which protects the PV system against hazards (i.e. prevention of electrical shock, fire hazards, and personal injury due to mechanical and environmental stresses). As a consequence, the connector contributes to the expected return on investment from the PV system.

It is common in the PV industry to have modules, Power Conversion Equipment (PCE), and other PV System Components certified by a third-party test laboratory according to the currently valid product safety standards (for example UL and IEC). It is also possible that several PV connector manufacturers are listed in the documentation for the certified end product. This might imply that PV connectors from different manufacturers can be safely mated, which is not the case. As addressed in several international publications, connections made with PV connectors from different manufacturers has been proven to create situations that can compromise the safety of a PV system and result in fire or electric shock.[1]

Clarification on misleading information
Some manufacturers of modules or PCE may indicate that mating PV connectors from different manufacturers will result in a well-performing and predictable electrical connection. This is not the case. A PV connector is defined as the combination of a mating part and its associated counterpart. Thus both connector parts have been designed and manufactured to exclusively work together. So a PV connector not mated with its associated counterpart cannot be relied upon to perform to its required electrical, mechanical and environmental specifications. This fact is widely recognized by independent, accredited third-party laboratories and corresponds to our 25+ years of in-house testing and experience in the PV industry. PV connectors are not designed and qualified to operate with PV connectors from other manufacturers. They are also not certified for such kind of end use as shown by the standards appended to this document.

Responsibility to be compliant
As installer, operator, or owner of a PV system the responsibility to be compliant to standards and regulations might lie with you. This responsibility includes compliance to local regulations (e.g. national electric codes) as well as to national and international standards. These regulations and standards linked to PV installations uniformly exclude electrical connections made by PV connectors from different manufacturers.

Statements referring to the term "MC4 compatible"
We have encountered statements, including testing documents from third party laboratories, which imply that certain PV connector manufacturers who have tested their connector to be "compatible" with Original MC4 or MC4-EVO 2 connectors made by Stäubli. These are unilateral statements which are not supported by Stäubli as owner of the Original MC4 product portfolio.

This attempt to declare mating "compatibility" between connectors from two manufacturers leads inevitably to an uncontrolled cross-mating of various product quality levels. Compliance to the electrical, mechanical

[1] For further information, see IEC TR 63225 or the normative references listed in the appendix of this document

Stäubli Electrical Connectors AG
Stockbrunnenrain 8
4123 Allschwil/Switzerland

Tel. +41 61 306 55 55
Fax +41 61 306 55 56
ec.ch@staubli.com
www.staubli.com/electrical

UBS AG 4002 Basel
BIC: UBSWCHZH80A CHE-105.826.901 MWST
CHF → IBAN: CH09 0024 5245 7505 3401 F
EUR → IBAN: CH25 0024 5245 7505 3460 Z

and climatic requirements cannot be guaranteed. The safety and reliability of the PV system will decrease (performance loss, downtime, maintenance costs, arcing, fire). As addressed above, Stäubli connectors mated with third-party connectors lose all relevant IEC and UL certification in their end use application and may interfere with your national electrical code and local regulations.

Further statements made by TÜV Rheinland and UL underline this fact. TÜV Rheinland stresses that compatibility can be confirmed “only for products of the same type family from the same manufacturer” and that the current certificate for the MC4 connector family is based “on positive results of tests on products with corresponding mating parts of the Original MC4 portfolio.

Test reports supplied by independent test institutes confirming any compatibility between Stäubli MC4 connectors and connectors of other manufacturers are misleading. Such documents are based on the combinations of tested products and linked solely to the lot number tested and listed in the report. Hence, these reports are not to be considered as certificates and do represent no generic statement in respect of the safety and reliability of the product combination. As uninvolved, but strongly concerned party, Stäubli rejects any liability claims or technical conclusions regarding cross mating configuration based on such test reports.

PV connector product liability excluded
As market leader, and with over 360 GW connected electrical power within the PV industry, Stäubli hereby draws your attention to the existing regulations and standards and emphasizes the fact that our PV connector portfolio (i.e. Original MC4 and MC4-Evo 2) may not be mated with products from other PV connector manufacturers.

The responsibility for any damage and liability for any claims resulting from negative effects of the described interconnection lies exclusively with the person or entity that has recommended or performed such misuse of our products. Stäubli may not be held liable for any damage resulting from such actions.

Sincerely,

Stäubli Electrical Connectors AG
Allschwil, Switzerland on March 25, 2021

Matthias Schuerch
Head of Global Product Management
Alternative Energies

Joachim Hirmke
Head of Engineering Alternative Energies

Appendix | International Standards addressing described topic

International Installation Standards for PV Systems

Reference	IEC 62548:2016
Title	**Photovoltaic (PV) arrays - Design requirements**
Clause	7.3.9 Plugs, sockets and connectors “Plugs and socket connectors mated together in a PV system shall be of the same type from the same manufacturer, i.e. a plug from one manufacturer and a socket from another manufacturer or vice versa shall not be used to make a connection.”
Reference:	IEC 60364-7-712:2017
Title	**Low voltage electrical installations - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems**
Clause	712.526 Electrical connections “Male and female connectors mated together shall be of the same type from the same manufacturer i.e. a male connector from one manufacturer and a female connector from another manufacturer or vice versa shall not be used to make a connection.”

International Product Safety Standards for PV Connectors

Reference	UL6703
Title	**Connectors for Use in Photovoltaic Systems**
Certification No	UL File E343181 (Original MC4, Original MC4-Evo 2)
URL	https://iq.ulprospector.com

Conditions of Acceptability:

“These devices have only been assessed for UL Recognition with specific types of mated connectors within their product family. They have not been assessed to operate with any other similar devices from any other manufacturer. “

Reference	IEC 62852:2014+A1:2020
Title	**Connectors for DC-application in photovoltaic systems – Safety requirements and tests**
Certification No	R 60127190 (Original MC4), R 60127169 (Original MC4-Evo 2)
URL	https://www.certipedia.com

Stäubli Electrical Connectors AG
Stockbrunnenrain 8
4123 Allschwil/Switzerland

Tel. +41 61 306 55 55
Fax +41 61 306 55 56
ec.ch@staubli.com
www.staubli.com/electrical

UBS AG 4002 Basel
BIC: UBSWCHZH80A CHE-105.826.901 MWST
CHF → IBAN: CH09 0024 5245 7505 3401 F
EUR → IBAN: CH25 0024 5245 7505 3460 Z