CHINT XINHUI

Cu&Al Connection Harness

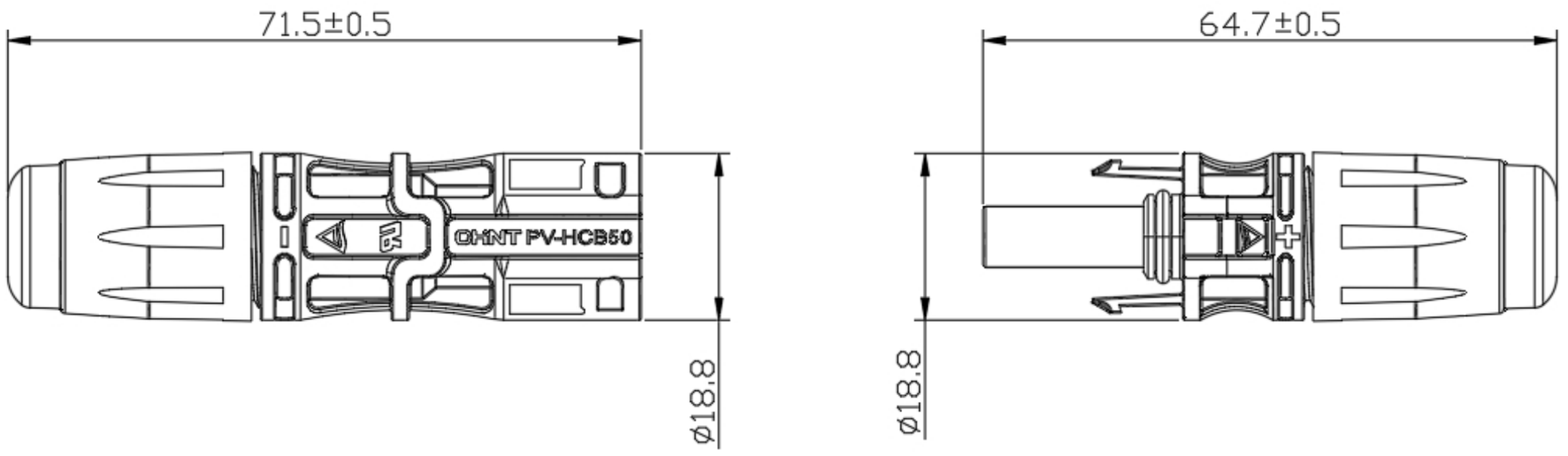
PV-HCB50

新品发布

New Product Release

www.chintxhpv.com

Outline Dimensions



Technical Parameters

Product Name	PV-HCB50
Rated Voltage	1500 V
Rated Current	46 A / 54 A
Protection Level	IP66 / IP68 (1 m，1h)
Application Class	Class A
Contact Resistance	⩽0.35 mΩ
Temperature Range	- 40 ℃ ～ + 85 ℃
Electrical Connection	Two-Stage Riveting Multi-Surface Electrical Contact
Application Scenarios	PPP 58205A:2021
Cable Standard	PPP 11029A
	TÜV 2PfG 2642
Al Wire Specifications	6 mm²，84 / 0.3 mm
	10 mm²，80 / 0.4 mm
	7 / 1.35 mm (Compatible but cable application does not comply with relevant standards)

Product Advantages

1、Patented Innovation Worry-Free Cu&Al Connection

Addresses bridging issues between aluminum and copper wires, as well as aluminum-to-aluminum connections.

2、Industry-First Two-Stage Crimping

Features two-stage riveting, multi-surface electrical contact, nearly 500 N tensile strength, ultra-low contact resistance, ensuring stability and reliability.

3、Enhanced Safety

Electrical connectors utilize a tin-plating process, tight riveting, and IP68-rated sealing design to prevent electrochemical corrosion.

4、Wide Compatibility

Compatible with MC4-type connectors (factory verification required for third-party connectors).

5、High Current Capacity

Ensures no separation of copper and aluminum under high-current loads.No abnormal temperature rise at riveting points.

Product Advantages

6、Ease of Plug-in Connection

Quick and secure connection with standard PV module connectors.

7、Cost Reduction and Market Adaptation

As aluminum replaces copper in PV applications, this connector accelerates market adoption as a cost-effective solution.

8、Wide Application Scenarios

Suitable for all photovoltaic connection systems.

9、Retains Key Features of Traditional Connectors

Supports high current and excellent sealing performance.Design closely resembles traditional connectors.

10、High Performance in Harsh Conditions

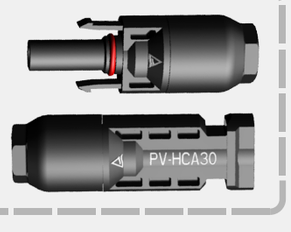
Superior resistance to external tensile forces and extreme temperature conditions，improved durability under cyclic stress compared to standard copper connectors.

Product Selection

PV-HCA30

Rated Current: 35 A

Rated Voltage: 1000 V



PV-HCB40

Rated Current: 40 A

Rated Voltage: 1500 V
2000 V

NEW
PV-HCB40P

Rated Current: 46 A / 54 A

Rated Voltage: 1500 V

NEW
PV-HCB40-1

Rated Current: 46 A / 54 A

Rated Voltage: 1500 V

Cable Size
6 / 10 mm²

Compatible Products

Stäubli
MC4(1000 V)
MC4 EVO2(1500 V)

PV-HCA30

Rated Current: 35 A

Rated Voltage: 1000 V

PV-HCB40

Rated Current: 40 A

Rated Voltage: 1500 V
2000 V

NEW
PV-HCB40P

Rated Current: 46 A / 54 A

Rated Voltage: 1500 V

NEW
PV-HCB40-1

Rated Current: 46 A / 54 A

Rated Voltage: 1500 V

Cable Size
6 / 10 mm²

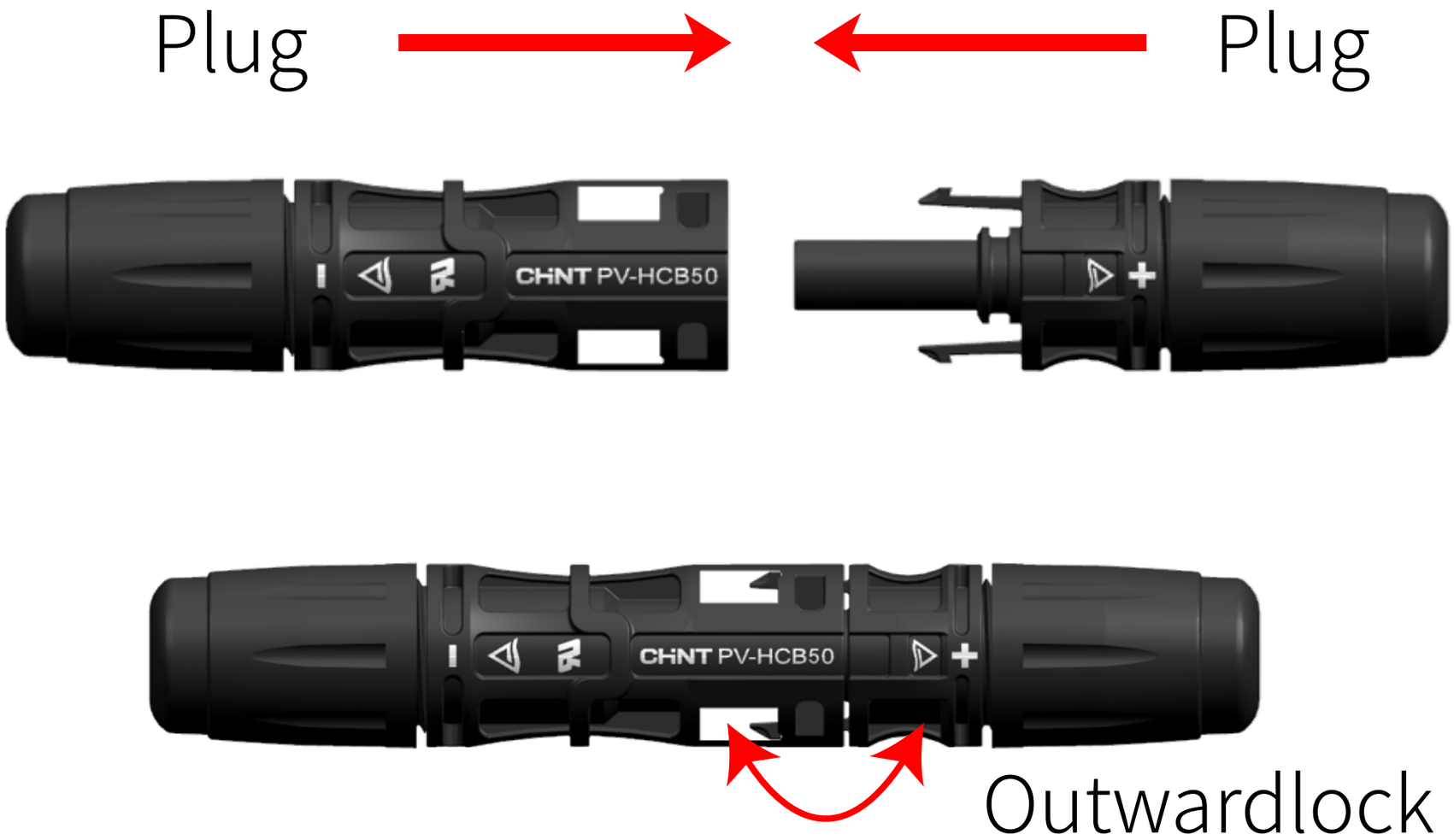
Compatible Products

Stäubli
MC4(1000 V)
MC4 EVO2(1500 V)

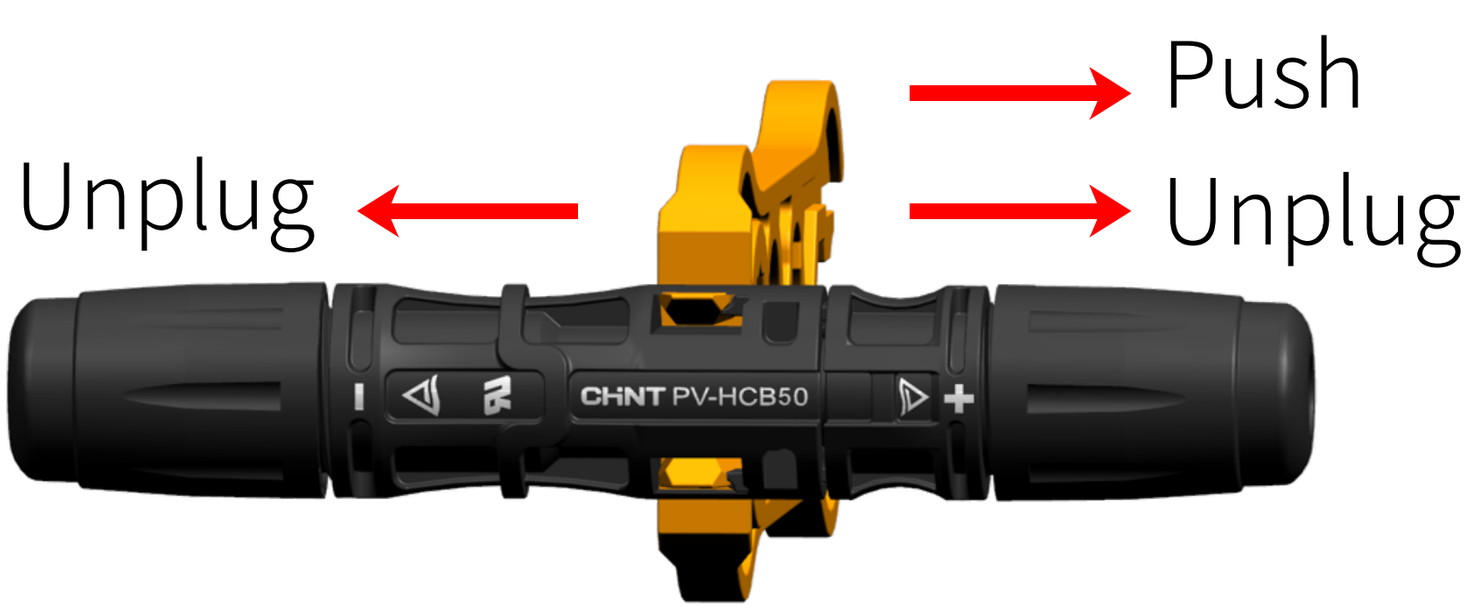
Note:
This product is compatible with 6/10 mm² outer diameter cables. Other sizes can be customized.

Operation method

1、The positive and negative connectors are plugged together (as shown in the diagram).



2、Insert the specialized tool (PV-MS-PLS/2) into the locking slot of the connector and push backward. Simultaneously, pull the positive and negative connectors in opposite directions to disengage them.



Safety Instructions

⚠ CAUTIONS

1、The product must be crimped and assembled using professional equipment at the factory.

2、Connectors must not come into direct contact with silicone or potting compounds; connector cables must not be subjected to hanging or pulling heavy loads.

3、Handle the products with care during loading, unloading, and transportation, and avoid subjecting them to heavy external pressure to prevent damage.

4、Personnel should wear appropriate electrostatic discharge (ESD) equipments during handling.

5、Unless a maintenance is required, frequent connection and disconnection of the system should be avoided.

Safety Instructions

⚠ CAUTIONS

6、Connectors must not be plugged or unplugged under load during maintenance，refer to the warning label on the connector diagram above.

7、Outdoor maintenance should be performed by qualified professionals.

8、Electrical installation instructions should include detailed descriptions of wiring methods based on the U.S. National Electrical Code (ANSI/NFPA 70).

9、During installation, ensure that cable tensile and torsional strength comply with operational standards; the cable should not be pulled at an angle less than 110 degrees relative to the connector; the cable and connector assembly must have a tensile strength greater than 150 N; the bending radius of the cable must be at least 5 times its outer diameter (5 od).

10、If the customer uses our connectors with substandard or incompatible connector sourced from the markets, resulting in quality issues, our company assumes no liability.

11、The warning label “Do not disconnect under load” must be printed on the connector surface!

Cu&Al Wiring Harness Solutions

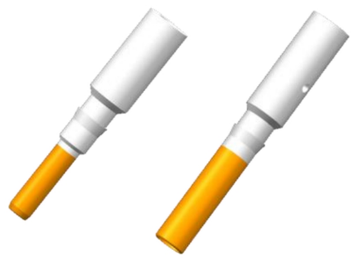
1、Compatibility Issues with Conventional Connector Mating

Product Iteration	Welding Scheme	Welding Method	Drawbacks of the Scheme
/	Traditional Scheme	Cu&Al Friction Welding	a. Friction-welded products have a defect rate of approximately 0.05% (due to oil contamination, dust) b. Effective electrical contact area varies significantly, difficult to inspect, resulting in unstable current-carrying capacity
First Generation	Mating Scheme	Cu&Al Friction Welding	a. Friction-welded products have a defect rate of approximately 0.05% (due to oil contamination, dust) b. Effective electrical contact area varies significantly, difficult to inspect, resulting in unstable current-carrying capacity
Second Generation	Mating Scheme	Cu-Clad Al Profile Upsetting	a. High energy consumption, long processing cycles, and lack of surface precision and quality b. Difficult manufacturing process for negative pins (with drum-shaped contact terminal)
Third Generation	/	Industry-First Two-Stage Crimping	A groundbreaking alternative to friction welding and copper-aluminum casting. Two stages ensures superior safety and reliability.

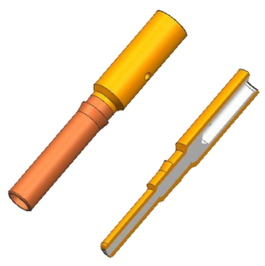
Cu&AI Wiring Harness Solutions

2、Traditional Copper-Aluminum Connection techniques such as friction welding and upsetting are incompatible with conventional pure copper connectors

Origin: Derived from electric power fitting market Cu&AI Friction Welding

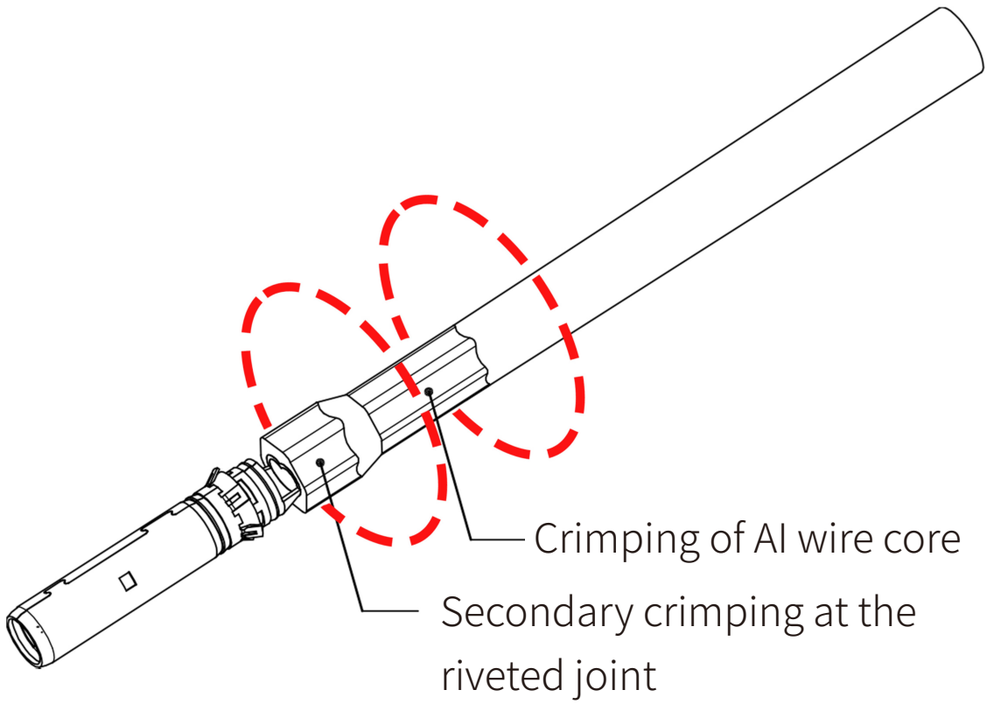


First Generation Mating Scheme Cu&AI Friction Welding



Second Generation Mating Scheme Cu-Clad AI Profile Upsetting

3、Industry-First Two-Stage Crimping: Utilizes pins and designs compatible with conventional copper connectors



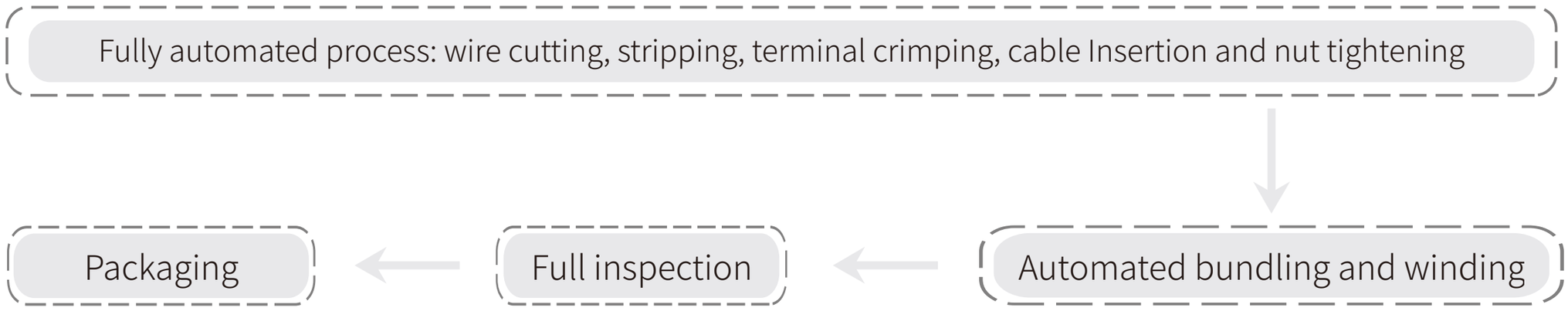
Industry First, Technological Breakthrough：
Dual-stage riveting, multi-surface electrical contact, nearly 500N tensile strength, and ultra-low contact resistance ensure stability and reliability；

Cross-Brand Compatibility Assurance：
Customizable connector housings and in-house developed contact pins are rigorously tested at the factory before shipment, ensuring safe and reliable mating；

Solutions for On-Site Construction Risks：
Addressing issues such as non-standard crimping, lengthy construction cycles, and reduced quality due to outdoor environments. Chint Xinhui's copper-aluminum connection harness adopts a fully automated production process. The complete harness assembly is finished internally, allowing for direct plugged in on-site, which significantly reduces construction time, enhances quality, and minimizes risks；

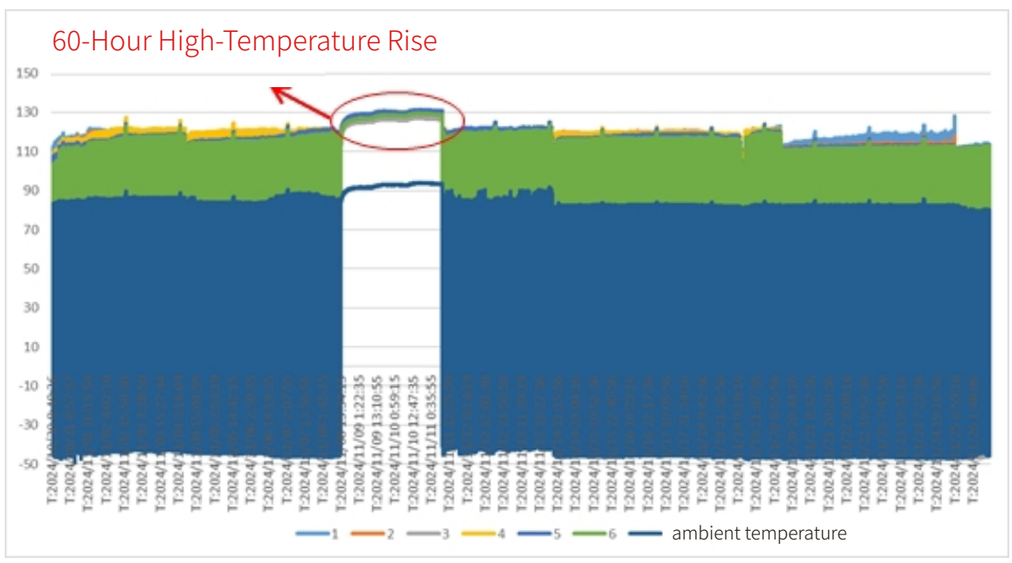
Cu&AI Wiring Harness Solutions

4、Chint Xinhui Wiring Harness System Production Process

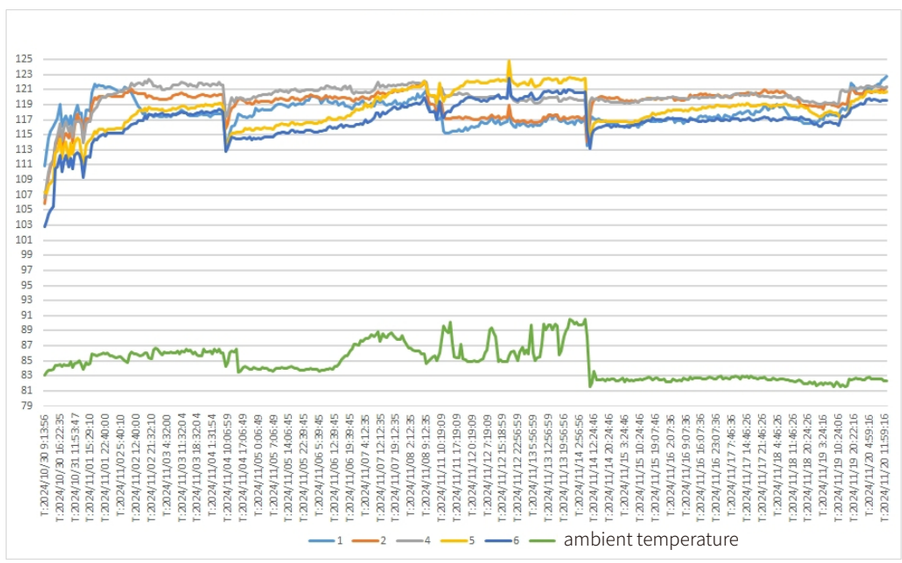


5、Enhanced Safety with Rigorous Testing, Exceeding the Performance of Existing Connector Products

45 A High-Low Temperature Cycling Test: Over 500 cycles

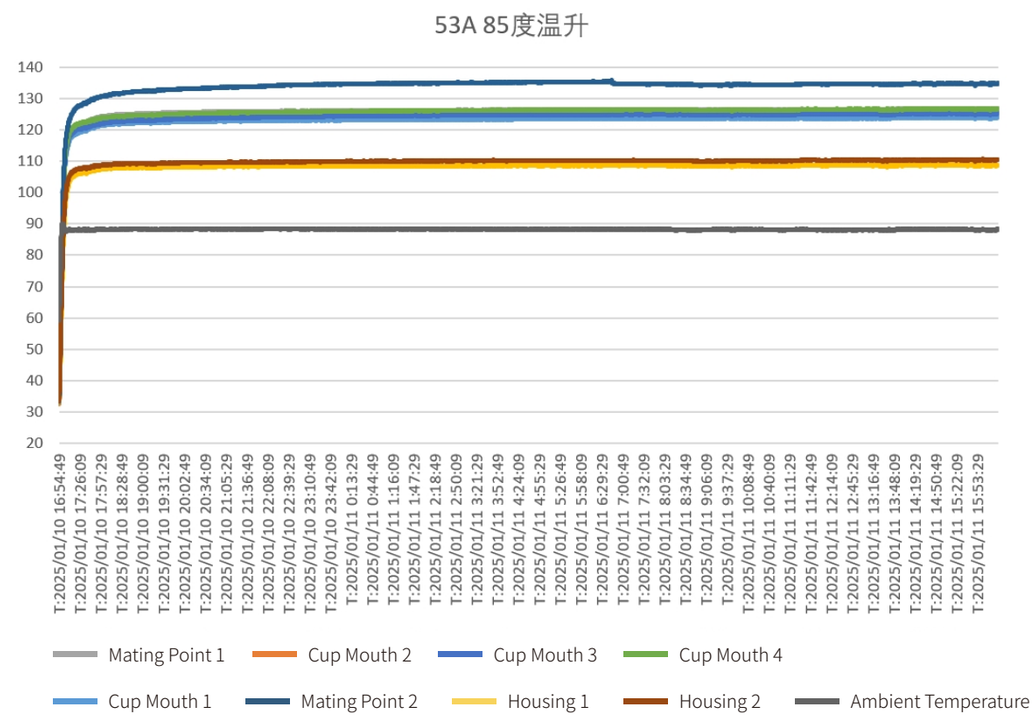


45 A Temperature Change Trend Per Cycle



Thermal Cycling (TC) Test - - Exceeds IEC standards by over 2 times

53A 85度温升



【Temperature Rise Test】

Rated current reaches 53 A

outperforming conventional connectors

浙江正泰鑫辉光伏有限公司质量检测中心

理化试验报告

报告编号	B241211xh1hg106008	样品编号	S20241211XHLH0007-1-1
委托单位	浙江正泰鑫辉光伏有限公司	供应商名称	开博
样品名称	铝线线束	图样代号	/
型号规格	6平方84股	检验批号	/
样品状态	样品状态完好，符合检测要求。	样品数量	1批
检测标准	GB/T33765-2017		
检测设备	弯曲试验机。		
检测项目	线缆弯曲		
检测项目	技术要求	检测结果	单项判定
线缆弯曲	90° 左右摇摆	实测数据： 开博6平方84股铝线线束在未通电的情况下进行90° 左右摇摆弯曲测试32000下停止摇摆	符合
以下空白。			

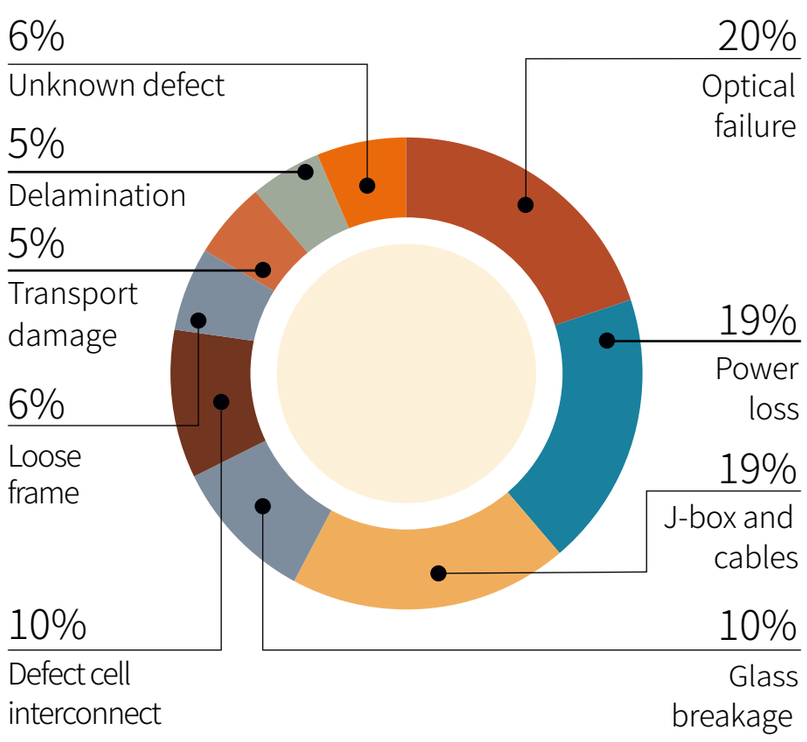
【Aluminum Wire Swing Test】

Over 30,000 cycles tested

Construction Risk

1、Connector Failure Rate

Connector failures account for up to 19 % of all PV power plants failures



Based on IEA-PVPS (2014a)

2、Increased Operational Costs

Inconsistent skill levels among construction personnel

High labor costs and recruitment challenges

Slow construction pace with quality issues

Long procurement lead times and increased inventory management costs

Difficulties in on-site transportation

Construction Risk

3、Increased Construction Risks

Variations in tolerances from different manufacturers.No unified industry standards or certifications to guarantee compatibility

Cross-Brand Compatibility Issues

Scratches on cable insulation reduce durability and weather

Cable Damage and Excessive Bending During Installation

Variations in on-site tools and operator experience lead to poor crimping quality

Improper Crimping of PV Connectors

Current PV projects require workers to measure and cut long connector harnesses on-site, slowing deployment

Extended On-Site Construction Cycles

4、Thin-Film PV Modules and Glass Curtain Wall Applications

Replacing 6mm² AI wire with 4mm² Cu wire, Or 2.5mm² Cu wire with 4 mm² AI wire, significantly reduces costs and weight.

5、Full-Scale PV Power Plants Applications

We offer several solutions for replacing Cu wires with Al wires: Replacing 4 mm² Cu wire with 6 mm² AI wire; 6 mm² Cu wire with 10 mm² AI wire; 10 mm² Cu wire with 16 mm² AI wire. Jumper cables, as standard components in PV plant design, can be replaced in bulk. Replacing 4 mm² Cu wire with 6 mm² Al wire improves harness quality while significantly reducing costs.

Product Information Statement

The product functionalities, technical parameters, operating instructions, and illustrative descriptions provided in this manual are compiled based on the latest knowledge available during the product development phase. In line with our ongoing product optimization and technological innovation strategies, the Company reserves the right to modify and improve product designs, software algorithms, and service content without prior notice.

The test data, performance metrics, and application cases mentioned in this manual reflect interim results obtained under specific testing environments. Actual outcomes may vary depending on usage scenarios, and such information shall not constitute legally binding quality commitments.

Users are advised that iterative updates to product functionalities may result in temporal discrepancies between the manual content and the latest product specifications. It is recommended to regularly visit the official website (http://www.chintxhpv.com) to access the most up-to-date technical documentation.

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CHINT XINHUI

Green connected world

Innovation shares value

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