

MC4连接器 MA231 (cn) 安装说明

适用于:
PV-KST4/...-UR
PV-KBT4/...-UR

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产品概览



1	插座 Socket	PV-KBT4/2.5...-UR
2	金属针 Contact	PV-KBT4/6...-UR PV-KBT4/10...



5	插座 Socket	PV-KBT4/5...-UR
6	金属针 Contact	PV-KBT4/8II-UR

可选配件



9	插座密封盖 Socket sealing cap	PV-BVK4
11	安全锁扣 Safety lock clip	PV-SSH4

MC4 connector MA231 (en) assembly instructions

Valid for:
PV-KST4/...-UR
PV-KBT4/...-UR

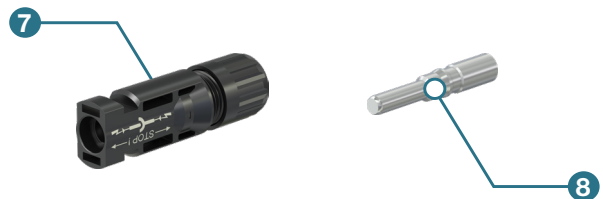
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Product overview



3	插头 Plug	PV-KST4/2.5...-UR
4	金属针 Contact	PV-KST4/6...-UR PV-KST4/10...



7	插头 Plug	PV-KST4/5...-UR
8	金属针 Contact	PV-KST4/8II-UR

Optional accessories



10	插头密封盖 Plug sealing cap	PV-SVK4
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安全须知

安装说明的重要性

不遵守安装说明和安全须知可能会导致因电击、电弧、火灾或系统故障而危及生命的人身伤害。

- 请完全按照安装说明的要求进行操作。
- 只可按照本安装说明和技术参数使用和安装产品。
- 安全妥善地保管安装说明，并将其移交给后续用户。

应用范围

该连接器对光伏阵列直流 (DC) 电路中的部件进行电气连接。该连接器可用于光伏系统以外的用途，例如，可作为低压直流 (LVDC) 部件。如果该部件被用于其他用途，则要求和规格可能与本文件中描述的有所不同。

- 要了解更多信息，请联系史陶比尔。
www.staubli.com/electrical

对人员的要求

仅电工或接受过电气指导的人员可以装配、安装和调试该系统。

- 电工是指接受过适当的专业培训，并具有适当的知识和经验的人员，能够识别和避免可能来自电力的危险。电工能够选择和使用合适的个人防护设备。
- 受过电气指导人员是指在电工的指导或监督下，能够识别和避免可能来自电力的危险的人员。

安装和装配的先决条件

- 切勿使用有明显损坏的产品。
- 仅应使用史陶比尔认可的工具、材料和辅助设备。
- 仅经过认证的光伏电缆才可装配到连接器上。

安全装配和安装

隔离或断开连接后，带电部件仍然通电

- 只有在光伏阵列或光伏组件断电的情况下才能安装本产品。

连接或断开连接

- 在连接或断开连接器之前，一定要切断光伏系统的电源。
- 切勿切断有负载的连接器。
- 切勿将史陶比尔连接器的公端或母端与其他制造商的连接器相连接。
- 连接器受污染时，切勿插合。
- 使用规定的工具解锁连接器。

切勿调整或修理部件

- 连接器仅可安装一次。
- 切勿在连接器装配好后进行调整。
- 更换有缺陷的部件。

Safety instructions

Importance of the assembly instructions

NOT following the assembly and safety instructions could result in life-threatening injuries due to electric shock, electric arcs, fire, or failure of the system.

- Follow the entire assembly instructions.
- Use and install the product only according to this assembly instructions and the technical data.
- Safely store the assembly instructions and pass them on to subsequent users.

Intended use

The connector electrically connects components within the DC circuits of a PV array.

The connector can be used for purposes other than those in a PV system, e.g., as a LVDC component. If the component is used for other purposes, then the requirements and specifications may be different from the ones described in this document.

- For more information, contact Stäubli
www.staubli.com/electrical

Requirements for personnel

Only an electrician or electrically instructed person may assemble, install, and commission the system.

- An electrician is a person with appropriate professional training, knowledge, and experience to identify and avoid the dangers that may originate from electricity. An electrician is able to choose and use suitable personal protective equipment.
- An electrically instructed person is a person who is instructed or supervised by an electrician and can identify and avoid the dangers that may originate from electricity.

Prerequisites for installation and assembly

- NEVER use an obviously damaged product.
- ONLY tools, materials and auxiliary means approved by Stäubli shall be used.
- ONLY approved PV cables shall be assembled to the connector.

Safe assembly and mounting

Live parts can remain energized after isolation or disconnection

- ONLY Install the product when the PV module is de-energized.

Mating and disconnecting

- ALWAYS de-energize the PV system before mating and disconnecting the connectors.
- NEVER disconnect the connectors under load.
- NEVER connect male or female part of Stäubli connector with connectors of other manufacturers.
- NEVER mate contaminated connectors.
- Use of tool is required to open locking-type connector.

Do NOT modify or repair component

- Mount connectors only once.
- Do NOT modify connectors after assembly.
- Replace defective connectors.

安装注意事项

说明
必须遵守国家或地方的电缆安装规定。

说明
如果要将本连接器用于光伏阵列以外的低压直流应用, 请查阅《史陶比尔技术说明报告》中的信息。
[Link](#)

关于安装的一般注意事项

- 必须为未插合的连接器安装密封盖(以防止环境影响(湿气、灰尘等))。
- 切勿插合被污染的连接。
- 连接器不得与任何化学品接触。
- 连接器应安装在避免直接日晒的位置。

电缆布线和电线管理

- 电缆从连接器出来应预留至少20(0.75 inches)毫米距离再进行弯折。
- 连接器不得位于电缆的最低点, 此处会有水聚集。

注意事项
弯折请参阅电缆制造商规格, 获取最小弯曲半径。

Notes on installation

Note
The local/national installation instructions regarding cables have to be observed.

Note
If the connector is to be used in low-voltage DC applications other than those in a photovoltaic array, please consult the information as provided in the Stäubli Technical Description Report.
[Link](#)

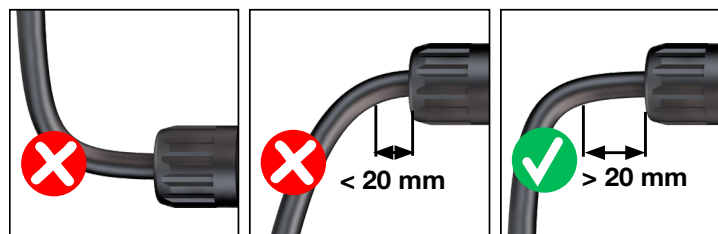
General notes on installation

- Unmated connectors must be protected from environmental impact (moisture, dirt, dust, etc.) with sealing caps.
- Do not mate contaminated connectors.
- Connectors must not come into contact with any chemicals.
- Connectors should be installed so that the exposure to direct sunlight is minimized.

Cable routing and wire management

- Cable management must allow a minimum of 20 mm (0.75 inches) of cable that exits directly from the cable seal without bending or stress.
- Do not allow that the connector is at the lowest point of cabling where water can collect.

Note
Refer to cable manufacturers specification for minimum bending radius.



被污染/损坏的连接器

- 确保连接器或插头连接器不会因环境影响(例如土壤、水、昆虫、灰尘等自然物质)而受到污染。
- 切勿让连接器的表面受到污染(如贴纸、油漆、热缩管)。
- 切勿将连接器直接置于屋顶表面。
- 连接器不得位于滞水中。
- 不得将电缆扎带直接安装在连接器本体上。

Contaminated/damaged connectors

- Make sure that the connector or plug connector does not become contaminated due to environmental influences (e.g. natural substances such as soil, water, insects, dust).
- Do not allow the connector to be contaminated on its surface (e.g. stickers, paint, heat shrink tubing).
- Do not allow that the connector is directly on the roofing surface.
- Do not allow that the connector is in standing water.
- Do not allow cable ties to be mounted directly on the connector body.

机械压力

- 检查确认连接器没有受到永久性机械拉伸负荷或振动的影响。
- 电缆管理不得使连接器受到应力。
- 连接器应避免被移动, 并应与机械负载 (例如光伏跟踪系统的移动部件) 隔离。

热应力

- 确保连接器不会受到过大的热应力。
- 安装连接器时, 应确保其有足够的散热空间。
- 禁止在空气流通不畅的区域 (例如, 大型线束、分体式线束或其他外壳) 安装连接器。
- 禁止直接埋入连接器。

Mechanical stress

- Check that the connectors are not subjected to a permanent mechanical tensile load or vibration.
- Connectors shall not be under strain from cable management.
- Connectors shall be constrained from dynamic movement and isolated from mechanical load, e.g. from moving components of a PV-Tracker system.

Thermal stress

- Ensure that the connector is not exposed to excessive thermal stress.
- Install the connector in such a way that sufficient heat dissipation is ensured.
- Installation in areas that restrict the air flow (e.g. in large bundles, in split looms or other housings) is not permitted.
- Direct burial of the connector is not permitted.

所需工具

(图 1)
剥线钳 PV-AZM...



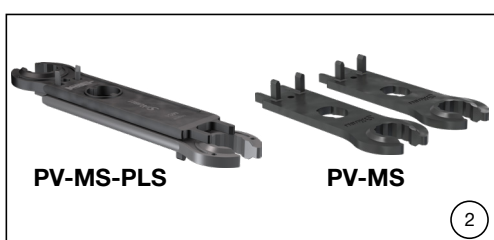
电缆截面积 Conductor cross section		型号 Type	订货号 Order No.
mm ²	AWG		
1.5/2.5/4/6	–	PV-AZM-156	32.6027-156
4/6/10	–	PV-AZM-410	32.6027-410
–	12/10/8	PV-AZM-128	32.6027-128
–	10/8/6	PV-AZM-106	32.6027-106

(ill. 1)
Stripping pliers PV-AZM...

注意事项
操作说明 MA267,
www.staubli.com/re-downloads.html

Note
Operating instructions MA267,
www.staubli.com/re-downloads.html

(图 2)
组装和解锁工具
PV-MS-PLS, 订货号 32.6058
或
开口扳手组合 PV-MS
订货号 32.6024

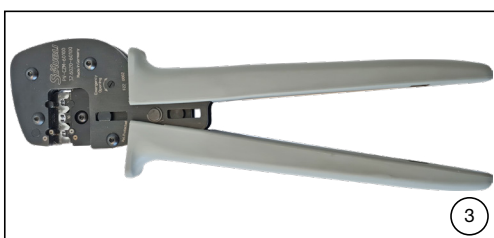


(ill. 2)
Assembly and unlocking tool
PV-MS-PLS, Order No. 32.6058
or
Open-end spanner set PV-MS,
Order No. 32.6024

注意事项
操作说明 MA270,
www.staubli.com/re-downloads.html

Note
Operating instructions MA270,
www.staubli.com/re-downloads.html

(图 3)
压接钳 PV-CZM-6x100 包括定位块和压接模具



(ill. 3)
Crimping pliers PV-CZM-6x100 incl.
locator and crimping die.

注意事项
操作说明 MA704,
www.staubli.com/re-downloads.html

Note
Operating instructions MA704,
www.staubli.com/re-downloads.html

(图 4)
压接钳 PV-CZM-2x100 包括定位块和压接模具



(ill. 4)
Crimping pliers PV-CZM-2x100 incl.
locator and crimping die.

注意事项
操作说明 MA251,
www.staubli.com/re-downloads.html

Note
Operating instructions MA251,
www.staubli.com/re-downloads.html

根据所选连接器使用对应的压接模具和定位块

Assign the crimping pliers die and locator according to the connector chosen

表1

型号 Type	电缆截面积 Conductor cross section	开口式金属针 Open crimp contacts (B型压接) B-Crimp	封闭式金属针 Closed crimp contacts* (O型压接) O-Crimp	压接钳 Crimping pliers					
				PV-CZM-61100* 32.6020-61100	PV-CZM-60100* 32.6020-60100	PV-CZM-64100 32.6020-64100	PV-CZM-63100 32.6020-63100	PV-CZM-23100 32.6020-23100	PV-CZM-22100 32.6020-22100
PV-KBT4/2,5...-UR, PV-KST4/2,5...-UR	2.5 mm ²	•		•					
	14 AWG	•		•		•			
PV-KBT4/6...-UR, PV-KST4/6...-UR	4 mm ²	•		•	•				•
	12 AWG	•		•	•	•			•
	6 mm ²	•		•	•				•
	10 AWG	•		•	•	•			•
PV-KBT4/5...-UR, PV-KST4/5...-UR	14 AWG		•			•	•	•	
	12 AWG		•			•	•	•	
	10 AWG		•			•	•	•	
PV-KBT4/8II-UR, PV-KST4/8II-UR	8 AWG		•			•	•	•	•
PV-KBT4/10II, PV-KST4/10II	10 mm ²	•			•				

❗ 注意事项

有关开口式金属针, 相关定位块和压接模具的信息, 请查看 操作说明 MA704, www.staubli.com/re-downloads.html
* 通用压接钳不可用于O型金属针 (PV-KST4/5...; PV-KBT4/5...; PV-KST4/8...; PV-KBT4/8...)
如果您使用的是带筒形压接器的蓝色钳子, 请参考用户手册 MA251。

❗ Note

For related crimping die and locator information, please see the operating instructions MA704, www.staubli.com/re-downloads.html
In case you have the blue set of pliers with barrel crimps in use, please consult user instruction MA251.



(图 5)
扭矩工具套组
PV-WZ-TORQUE-SET,
订货号 32.0065

(ill. 5)
Torque tool set
PV-WZ-TORQUE-SET,
Order No. 32.0065



(图 6)
测试棒 PV-PST
订货号 32.6028

(ill. 6)
Test plug PV-PST
Order No. 32.6028



(图 7)
电缆切割工具 PV-WZ-KS,
订货号 32.6080

(ill. 7)
Cable cutter PV-WZ-KS,
Order No. 32.6080

❗ 注意事项
操作说明 MA705,
www.staubli.com/re-downloads.html

❗ Note
Operating instructions MA705,
www.staubli.com/re-downloads.html

存放

- 将连接器部件存放在温度恒定 (-30 °C 至 +60 °C) 且相对湿度低于 70% 的环境中。
- 部件不得因直接降雨、冷凝或类似情况而受潮。
- 不得让部件接触酸、碱、气体、丙酮或其他化学腐蚀性物质。

Storage

- Store the components at a constant storage temperature in the range of -30 °C to +60 °C and at less than 70 % relative humidity.
- The components must not be exposed to moisture due to direct rainfall, condensation or similar.
- Do not allow components to come into contact with acids, alkalis, gases, acetone or other chemically aggressive substances.

连接器选型指南

ⓘ 注意事项

如果所用电缆直径符合两个型号的外径尺寸界限，请使用较小的密封圈。

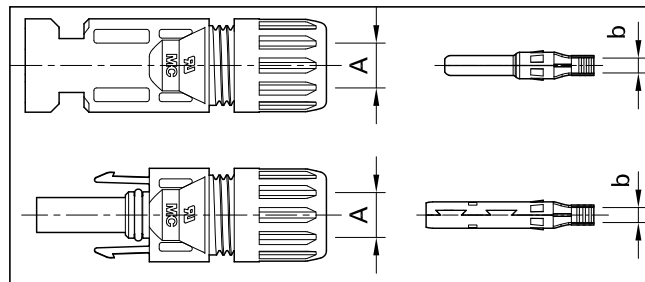
电缆准备

对于 IEC 应用，可以连接符合 IEC 60228 5 类或 6 类的柔性绝缘电缆。对于 UL 应用，务必应用 B 类或以上的电力电缆。

⚠ 注意

建议使用镀锡导线。切勿使用无保护（外露*）或已生锈的导体。所有史陶比尔光伏电缆均具有高品质的镀锡导体。出于安全考虑，史陶比尔禁止使用 PVC 电缆或 H07RN-F 型号的未镀锡电缆。

* 以下产品可以接受使用裸露的铜电缆（B 类或以上）：
PV-KBT4/5...-UR, PV-KST4/5...-UR, PV-KBT4/8II-UR 和
PV-KST4/8II-UR



(图 8)

- 检查尺寸 A 和 b，参见第 7 页的表 2 和第 8 页的表 3。

ⓘ 注意事项

支持使用表 2 或 3 未提及的其他电缆组合。请联系史陶比尔。

TÜV-Rheinland检测认可的连接器选型

连接到连接器的电缆应适用于光伏系统且应符合 IEC 62930 的要求

表2/Tab. 2

A: ø 电缆直径范围 [mm] A: ø range of the cable [mm]	导线截面积 Conductor cross section			
	2.5 mm ²	4 mm ²	6 mm ²	10 mm ²
5.0 – 6.0	PV-KxT4/2,5I-UR	PV-KxT4/6I-UR	PV-KxT4/6I-UR	PV-KxT4/10I
5.5 – 7.4	PV-KxT4/2,5X-UR	PV-KxT4/6X-UR	PV-KxT4/6X-UR	PV-KxT4/10X
7.0 – 8.8	PV-KxT4/2,5II-UR	PV-KxT4/6II-UR	PV-KxT4/6II-UR	PV-KxT4/10II
b: 控制尺寸 b: control dimension	~4 mm	~5.8 mm		~6.5 mm

ⓘ 注意事项

在选择光伏电缆时需要考虑以下事项：
- 光伏电缆的护套材料必须符合 IEC 60664-1 中 1 级绝缘标准的规定。

Guideline for connector configuration

ⓘ Note

If the outer diameter of the selected cable fits in the range of two different sealing sizes, please select the smaller size.

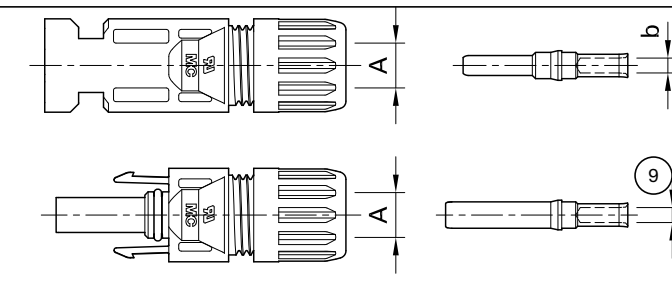
Cable preparation

For IEC applications cables with flexible conductors of class 5 or 6 according to IEC 60228 shall be connected. For the UL approved range applications power cables of class B or higher shall be connected.

⚠ Attention

It is recommended to use tinned copper conductors. Do not use uncoated (bare*) nor already oxidized copper conductors. All Stäubli solar cables have high-quality, tinned conductors. For safety reasons, Stäubli prohibits the use of PVC cables and the use of non-tinned cables of type H07RN-F.

* For bare copper conductors, class B or higher, select the following products: PV-KBT4/5...-UR, PV-KST4/5...-UR, PV-KBT4/8II-UR and PV-KST4/8II-UR.



(iii. 8)

- Check dimensions A and b, see Tab. 2 on page 7 and tab. 3 on page 8.

ⓘ Note

In case that other diameters than those mentioned in Tab. 2 and Tab. 3 are used contact Stäubli.

Choose connector configuration verified by TÜV-Rheinland

Cables connected to the connector shall be suitable for use in photovoltaic systems and shall comply with the requirements of IEC 62930.

使用UL认证电缆时的连接器选型

连接到连接器的电缆应适用于光伏系统且应符合 ZKLA (PV-线) 或 TYLZ (USE-2) 的要求。仅适用于铜导体。

表3/Tab. 3

电缆类型 Type of cable	TYLZ (USE-2)		
额定电压 [V] DC Rated voltage [V] DC	600		
	Open crimp contacts		
A: 光伏电缆外径 [mm] A: Outer Ø PV wire [mm]	AWG14	AWG12	AWG10
4.80 – 6.20	PV-KxT4/2,5I-UR	PV-KxT4/6I-UR	PV-KxT4/6I-UR
6.20 – 7.00	PV-KxT4/2,5X-UR	PV-KxT4/6X-UR	PV-KxT4/6X-UR
7.00 – 8.60	PV-KxT4/2,5II-UR	PV-KxT4/6II-UR	PV-KxT4/6II-UR
8.30 – 8.56			
绞线数量 Quantity of stranding	19 – 49	7 – 65 *	7 – 78 *
b: 控制尺寸 [mm] b: control dimension [mm]	4	5.8	5.8

电缆类型 Type of cable	ZKLA (PV-wire)		
额定电压 [V] DC Rated voltage [V] DC	600/1000/1500		
	Open crimp contacts		
A: 光伏电缆外径 [mm] A: Outer Ø PV wire [mm]	AWG14	AWG12	AWG10
5.60 – 6.20	PV-KxT4/2,5I-UR	PV-KxT4/6I-UR	PV-KxT4/6I-UR
6.20 – 7.00	PV-KxT4/2,5X-UR	PV-KxT4/6X-UR	PV-KxT4/6X-UR
7.00 – 8.60	PV-KxT4/2,5II-UR	PV-KxT4/6II-UR	PV-KxT4/6II-UR
6.00 – 8.80			
绞线数量 Quantity of stranding	19 – 49	7 – 65 *	7 – 78 *
b: 控制尺寸 [mm] b: control dimension [mm]	4	5.8	5.8

* 首选导体绞线: 19-65

Selection of connector configuration when using cables certified at UL

Cables terminated to the connectors shall be suitable for use in photovoltaic systems and shall comply with the requirements of ZKLA (PV-wire) or TYLZ (USE-2). Intended for use with copper conductors only.

Closed crimp contacts			
AWG14	AWG12	AWG10	AWG8
PV-KxT4/5I-UR	PV-KxT4/5I-UR	PV-KxT4/5I-UR	
PV-KxT4/5X-UR	PV-KxT4/5X-UR	PV-KxT4/5X-UR	
PV-KxT4/5II-UR	PV-KxT4/5II-UR	PV-KxT4/5II-UR	
			PV-KxT4/8II-UR
7 – 49	7 – 65	7 – 37	7 – 168
~3	~3	~3	~4.4

Closed crimp contacts			
AWG14	AWG12	AWG10	AWG8
PV-KxT4/5I-UR	PV-KxT4/5I-UR	PV-KxT4/5I-UR	
PV-KxT4/5X-UR	PV-KxT4/5X-UR	PV-KxT4/5X-UR	
PV-KxT4/5II-UR	PV-KxT4/5II-UR	PV-KxT4/5II-UR	
			PV-KxT4/8II-UR
7 – 49	7 – 65	7 – 78	7 – 168
~3	~3	~3	~4.4

* preferred conductor stranding: 19-65

说明

如果您选择的电缆同时适用于表2和表3列出的选型并且符合第13页的技术参数, 您可以将其作为双认证电缆 (TÜV Rheinland 和 UL) 来使用。

Note

If your chosen cable is suitable for both configurations listed in Tab. 2 and 3 as well as in the technical data on page 13, it can be used as a double certified cable according TÜV Rheinland and UL.

说明

对于加拿大: 安装应符合 CSA C22.1-2021《加拿大电气规范》第一部分第25版修订日期为2021年3月《电气安装安全标准》。该连接器与电缆导体连接时的载流量应当是基于电缆导体温度为75°C或更高。该连接器仅适用于B类和C类多股铜导体 (参见 NFPA NEC 70第9章表10, 2023版)。

Note

For Canada: Installation shall be in accordance with CSA C22.1-2021, Canadian Electric Code, Part I, Edition 25, Revision Date 03/2021, Safety Standard for Electrical Installations. The connectors/devices are intended to be wired with conductors where the ampacity is based on a conductor temperature of 75°C or higher. The connector is suitable for use only with Class B and C stranded copper conductors (See NFPA NEC 70, Chapter 9, Table 10, Edition 2023).

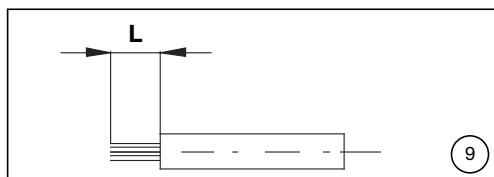


表4/Tab. 4

型号/Type	长度/Length "L"
PV-KxT4/2,5...	6 mm – 7.5 mm
PV-KxT4/6...	6 mm – 7.5 mm
PV-KxT4/5...	8.5 mm – 10 mm
PV-KxT4/8...	8.5 mm – 10 mm
PV-KxT4/10...	6 mm – 7.5 mm

剥线

(图 9)

- 根据表 4 提及的范围, 剥掉电缆的绝缘层 (长度 L), 并检查。

⚠ 注意

剥离电缆时切勿切断单股铜丝!

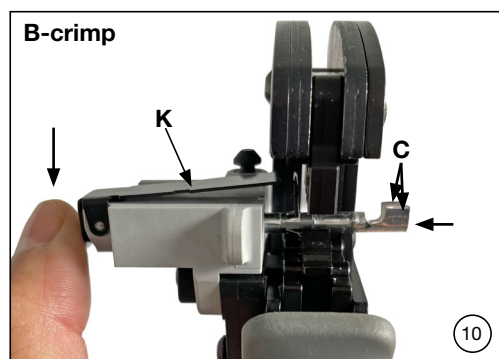
Stripping the cable

(ill. 9)

- Strip cable insulation (length L) according to ranges mentioned in Tab. 4 and check.

⚠ Attention

Do not cut strands when stripping the cable.



(图 10)

用于压接开口压接式插针 (B-Crimp)
PV-KT4/2.5...-UR; PV-KXT4/6...-UR
或 PV-KXT4/10...。

- 打开并握住夹钳 (K)。
 - 将插针置于适当的截面积范围内, 使其完全位于定位装置内。
 - 向上旋转压接片 (C), 使其呈“U”形。
 - 松开夹钳 (K)。
- 压接完成。

Crimping

(ill. 10)

For crimping open crimp contacts
(B-Crimp)
PV-KxT4/2.5...-UR; PV-KxT4/6...-UR
or PV-KxT4/10...

- Open clamp (K) and hold tight.
 - Insert the contact in the appropriate cross-section range so that it is completely in the positioning device.
 - Turn the crimping flaps (C) upwards so that they look like an “U”.
 - Release clamp (K).
- The contact is locked.

ⓘ 注意事项

操作说明 MA704,
www.staubli.com/re-downloads.html

ⓘ Note

Operating instructions MA704,
www.staubli.com/re-downloads.html



(图 11)

用于压接闭合压接式插针 (O-Crimp)
PV-KxT4/5...-UR 或 PV-KxT4/8II-UR

- 将插针置于适当的截面积范围内。

对于 PV-KxT4/5... 和 PV-KxT4/8...:

- 将插针置于合适的定位器位置, 根据导体截面积进行压接。

(ill. 11)

For crimping closed crimp contacts
(O-Crimp)
PV-KxT4/5...-UR or PV-KxT4/8II-UR

- Place the contact in the appropriate cross-section range.

For PV-KxT4/5... and PV-KxT4/8...:

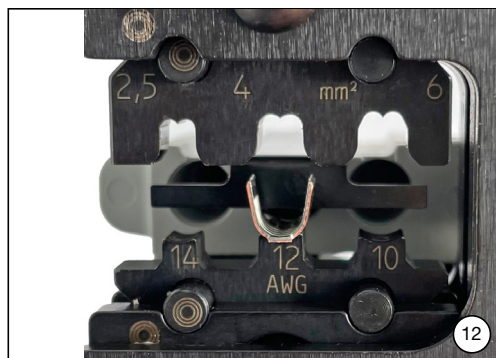
- Place contact into the appropriate locator position, based on conductor cross-section to be crimped.

ⓘ 注意事项

操作说明 MA251/704,
www.staubli.com/re-downloads.html

ⓘ Note

Operating instructions MA251 or
MA704,
www.staubli.com/re-downloads.html

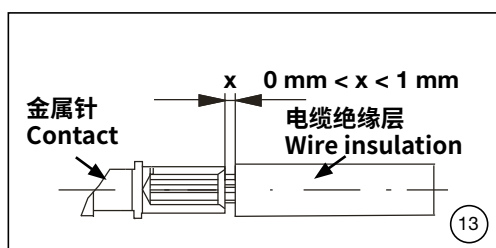


(图 12)

- 放置金属针并固定到正确位置。

(ill. 12)

- Press the crimping pliers gently together until the crimping flaps are properly located within the crimping die.



(图 13)

⚠ 注意

必须保持金属针和电缆绝缘层之间的距离X

(ill. 13)

⚠ Attention

The distance **x** between the crimped contact and the wire insulation must be maintained.

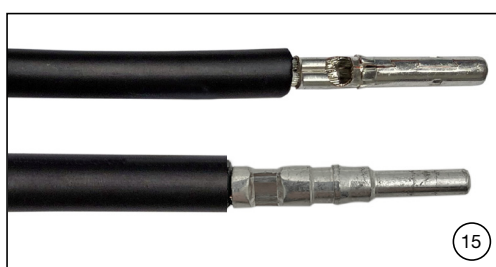


(图 14)

- 插入剥皮后的电缆末端,使电缆导体与金属针的压接套充分接触
- 再压紧压接钳。
- 打开压接钳,并取出压接完成的电缆。

(ill. 14)

- Insert the stripped lead end until the lead strands come up against the locator.
- Completely close the crimping pliers.
- Open the crimping pliers and the clamp to remove the crimped lead.



(图 15)

根据 IEC 60352-2 编写标准,目视检查压接。

请确认:

- 所有铜丝均插入压接套
- 压接套没有变形或缺失
- 压接形状对称
- 在连接侧或压接侧,导线可见。

(ill. 15)

Visually check the crimp according to the criteria written in IEC 60352-2.

Confirm that:

- all of the strands have been captured in the crimp sleeve
- the crimp sleeve is not deformed or missing any portion of the crimp flaps
- that the crimp is symmetrical
- a "brush" of conductor strands are visible on the contact side of crimp.

安装检查

(图 16)

- 将压接的插针插进公/母绝缘外壳, 直至啮合。将压好的触头从后方插入绝缘体中直到啮合在一起。
- 轻轻拉动拉回导线, 检查金属部分是否正确连接。



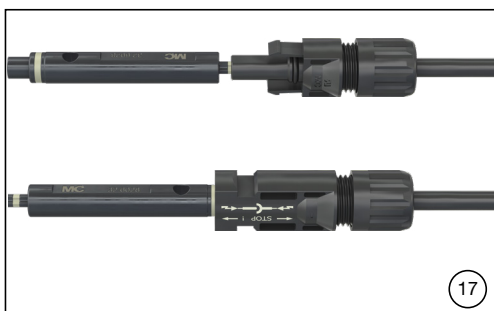
Assembly check

(ill. 16)

- Insert the crimped contact into the insulator of the male or female coupler until engaged. You will typically hear a “click” sound once fully engaged.
- Pull gently the cable to verify that the metal part is correctly engaged.

(图 17)

- 将测试棒正确的一端最大限度地插入公/母连接器。如果触头位置正确, 测试棒上的白色标记必须仍然可见。



(ill. 17)

- Insert the appropriate end of the test pin into the male or female coupler as far as it will go. If the contact is assembled properly the white mark on the test pin must still be visible.

电缆格兰头装配

(图 18)

- 使用工具 PV-MS 或 PV-MS-PLS, 预先拧紧电缆格兰头。
- 使用扭矩工具组拧紧电缆格兰头, 同时用组装和解锁工具支撑绝缘外壳前部。扭矩值必须与所使用的光伏电缆匹配。

拧紧扭矩须与使用的光伏电缆匹配。典型值在 3.4 N m 与 3.5 N m 之间¹⁾。

¹⁾ 史陶比尔建议使用校准的扭矩扳手进行组装。根据 NFPA 国家电气规范 (NEC 2017) 章节 110.14(D) 要求使用校准的扭矩扳手。



Cable gland assembly

(ill. 18)

- Pre-tighten cable gland with open-end spanner.
- Tighten cable gland using the torque tool set while holding up the insulator front with assembly and unlocking tool.

The tightening torque must be appropriate for the solar cables used. Typical values are between 3.4 N m and 3.5 N m¹⁾.

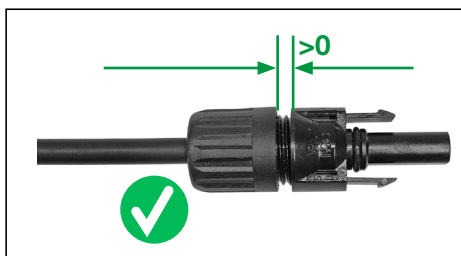
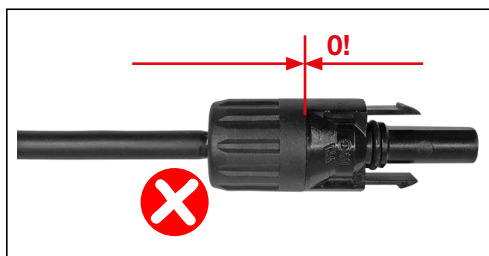
¹⁾ Stäubli recommends to use a calibrated torque wrench for assembly. The NFPA National Electric Code (NEC 2017) requires the use of a calibrated torque wrench in section 110.14(D).

注意

关于部件的安装我们建议在 -15°C 至 35°C 的环境温度下进行。

Note

For assembly of components an ambient temperature between -15 °C and 35 °C is recommended.



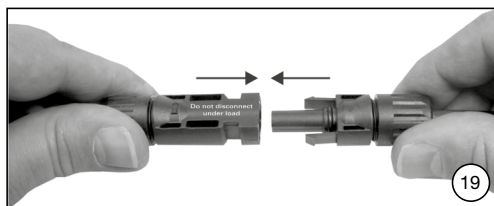
注意

切勿将螺帽拧到底, 需留有间隙。

Note

Do not bottom out the capnut.

插入和拔出 (无安全锁扣PV-SSH4)

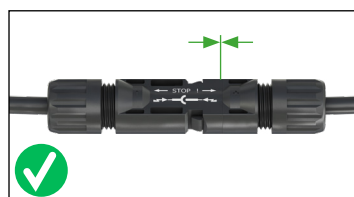
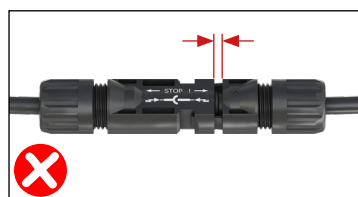


插入 (图 19)

- 连接电缆连接器, 直到听到“喀哒”声为止。
- 轻轻拉动连接器以便确认是否正确啮合。(使用最大力 max. 20 N)。

Mating (ill. 19)

- Mate the connectors until a „click“ can be heard.
- Check correct engagement by gently pulling the connector (maximum pulling force: 20 N).

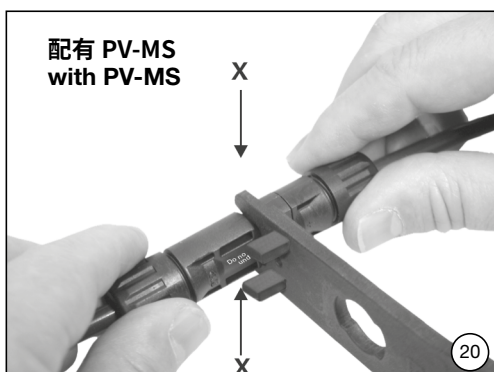


⚠ 注意

不得安装未完全啮合的连接器, 因为这可能会导致夹/测试夹永久偏移, 进而丧失锁定功能。无论何时都必须验证正确装配插合。

⚠ Attention

Assembly of not fully engaged connectors is not permitted as this could lead to a permanent deflection of clips and thus to a potential loss of the locking function. The correct mating has to be verified.



插入和拔出 (有安全锁扣PV-SSH4)

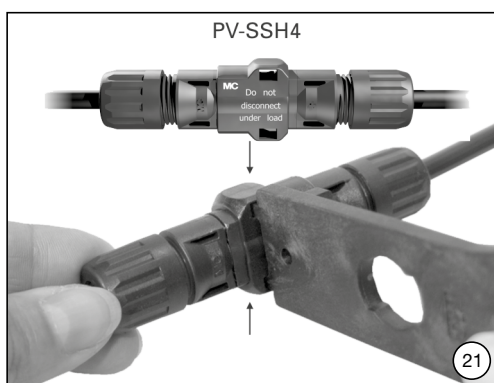
拔出 (图 20)

- 使用组装和解锁工具进行断开连接。

Disconnecting (ill. 20)

- Use assembly and unlocking tool to disconnect.

Mating and disconnecting the cable coupler once safety lock clip PV-SSH4 is involved



插入 (图 21)

- 连接电缆连接器, 直到听到“喀哒”声为止。
- 将连接器公母互插直至啮合。轻轻拉动连接器以便确认是否正确啮合。(使用最大力 max. 20 N)。

Mating (ill. 21)

- Mate the connectors until a „click“ can be heard.
- Check correct engagement by lightly pulling on the connector (maximum pulling force: 20 N).

拔出

- 将安装与解锁工具PV-MS 或 PV-MS-PLS 推入 PV-SSH4 附带的开口中, 插入插座锁扣中, 并断开耦合。
- 断开连接器连接。

Disconnecting

- Push the unlocking pins of assembly and unlocking tool into the openings provided in PV-SSH4 and onto the locking clips of the socket.
- Separate the connectors.

技术参数

Technical data

型号名称	Type designation	PV-KBT4/xy-UR PV-KST4/xy-UR
连接系统	Connector system	Ø 4 mm
额定电压: IEC 62852:2014 + Amd1:2020 2 PfG 2330/03.2023 UL 6703	Rated voltage: IEC 62852:2014 + Amd1:2020 2 PfG 2330/03.2023 UL 6703	DC 1100 V ¹⁾ DC 1500 V ^{1), 2)} DC 1500 V ³⁾
额定电流 IEC (85 °C)	Rated current IEC (85 °C)	22,5 A (2,5 mm²) 39 A (4 mm²/6 mm²) 45 A (10 mm²)
额定电流 (UL)	Rated current (UL)	30 A (14 AWG) ⁴⁾ 35 A (12 AWG) ⁴⁾ 50 A (10 AWG) ⁴⁾ 70 A (8 AWG) ⁴⁾
额定脉冲电压	Rated impulse voltage	12 kV (DC 1000 V) 16 kV (DC 1500 V)
环境温度范围	Ambient temperature range	-40 °C...+85 °C (IEC) -40 °C...+85 °C (UL)
运输/存储温度范围	Transportation/storage temperature range	-30 °C...+60 °C
运输/存储相对湿度	Transportation/storage relative humidity	< 70 %
温度上限	Upper limiting temperature (ULT)	105 °C (IEC)
最大工作温度 (UL 6703)	Max. operating temperature (MOT) acc. to UL 6703	+85 °C ⁴⁾
防护等级, 已插合	Degree of protection, mated	IP65/IP68 (1 m, 1 h)
防护等级, 未插合	Degree of protection, unmated	IP2X
过压类别	Overvoltage category	III
连接器的接触电阻	Contact resistance of plug connectors	0,25 mΩ
锁紧系统	Locking system	Locking type
安全等级 (IEC)	Safety class (IEC)	II: DC 1100 V 0: DC 1500 V
连接系统	Contact system	MULTILAM
连接类型	Type of termination	压接/Crimping
插拔次	Number of mating cycles	100
触头材料	Contact material	铜、镀锡/Copper, tin plated
绝缘材料	Insulation material	PC/PA
阻燃等级	Flame class	UL94-V0
盐雾试验, 严酷等级6	Salt mist spray test, degree of severity 6	IEC 60068-2-52
耐氨性 (参考DLG)	Ammonia resistance (according to DLG)	6076F (1500 h, 70 °C/70 % RH, 750 ppm)
获得 TÜV-Rheinland 认证, 依据 IEC 62852:2014 + Amd.1:2020	TÜV-Rheinland certified according to IEC 62852:2014 + Amd.1:2020	R 60127190
获得 TÜV-Rheinland 认证 依据 2 PfG 2330/03.2023	TÜV-Rheinland certified according to 2 PfG 2330/03.2023	R 60087448
获得UL认证, 依据UL 6703 ⁵⁾ 和 CSA C22.2. No. 182.5 (cULus Listed and UL Recognized) ⁶⁾	UL certified according to UL 6703 ⁵⁾ and CSA C22.2. No. 182.5 (cULus Listed and UL Recognized) ⁶⁾	E343181
获得JET认证, 依据 IEC 62852:2014	JET certified according to IEC 62852:2014	1625-C4304-302
CQC 认证	CQC certified	2013003030Z
最高工作海拔高度, 依据 IEC 62852:2014 + Amd.1:2020	Max. operating altitude above sea level according to IEC 62852:2014 + Amd.1:2020	5000 m; AK 60159411
温度等级, 依据 IEC TS 63126:2020	Temperature Level according to IEC TS 63126:2020	Level 2; AK 60158515

¹⁾ 连接到连接器的电缆应适用于光伏系统且应符合 IEC 62930 的要求。

Cables connected to the connector shall be suitable for use in photovoltaic systems and shall comply with the requirements of IEC 62930.

²⁾ 只能用于配有限制进入通道的 PV 系统/Only for use in PV-systems in access-restricted areas.

³⁾ 有关适用的电缆外径, 请参见本装配说明中的表 3。/For applicable cable diameter please see table 3 in this assembly instructions.

⁴⁾ 工程审议: 与额定电流相关的应用场景必须经过终端使用产品的验证, 且不得超过产品的最大工作温度。

Engineering considerations: Application associated current ratings have to be verified in the products end-use and shall not exceed the maximum operating temperature.

⁵⁾ 连接器仅当按照这些组装说明中指定的方式组装时, 才被视为符合UL6703第1版2021年6月10日修订版的要求。/The connector is considered to be in compliance with UL6703, Edition 1, Revision Date 06/10/2021 only when assembled in the manner specified by these assembly instructions.

⁶⁾ PV连接器也获得了cULus认证, 即使PV连接器外壳上印有UL认证组件标志 (UR)。/The PV connectors have also been certified as cULus Listed products even if the UL Recognized Component Mark (UR) is molded on the PV connector housing.

备注/Notes:

制造商/Manufacturer:
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Stockbrunnenrain 8
4123 Allschwil/Switzerland
Tel. +41 61 306 55 55
Fax +41 61 306 55 56
mail ec.ch@staubli.com
www.staubli.com/electrical