

MA275 (中_英) 安装说明

PV母面板插座
PV-ADBP4-S2, PV-ADBP4-S2-UR
PV公面板插座
PV-ADSP4-S2, PV-ADSP4-S2-UR
PV带线母面板插座
MC-K.../PV-ADBP4-S2, MC-K.../PV-ADBP4-S2-UR
PV带线公面板插座
MC-K.../PV-ADSP4-S2, MC-K.../PV-ADSP4-S2-UR

目录	
安全须知	2-4
所需工具	5
剥线	7
压接	7
连接器安装	8
安装检查	9
插入和拔出	10
技术参数	11

MA275 (cn_en) Assembly instructions

PV Female panel receptacle
PV-ADBP4-S2, PV-ADBP4-S2-UR
PV Male panel receptacle
PV-ADSP4-S2, PV-ADSP4-S2-UR
PV Female panel receptacle with cable
MC-K.../PV-ADBP4-S2, MC-K.../PV-ADBP4-S2-UR
PV Male panel receptacle with cable
MC-K.../PV-ADSP4-S2, MC-K.../PV-ADSP4-S2-UR

Content	
<i>Safety Instructions</i>	2-4
Tools required	5
Stripping	7
Crimping	7
Installation of couplings	8
Assembly check	9
Plugging and unplugging	10
Technical data	11

公面板插座
 Male panel receptacle
PV-ADSP4-S2
PV-ADSP-S2-UR



母面板插座
 Female panel receptacle
PV-ADBP4-S2
PV-ADBP4-S2-UR



可选件 / Optional:



PV-SVK4



PV-SSH4



PV-BVK4

安全须知

本装配说明和装配步骤说明是 TÜV 和 UL 认证的重要组成部分和先决条件。

产品可由具备电气技能或受过此方面指导的人员依照适用的安全法规进行装配或安装。
如您未遵守上述警告, 则 Stäubli Electrical Connectors (Stäubli) 不承担任何责任。

仅可使用 Stäubli 指定的组件和工具。自行装配时, 切勿背离本手册所述的制备及装配说明, 否则 Stäubli 无法保证产品安全性或性能达到官方技术参数。请勿以任何方式修改产品。

非 Stäubli 原厂制造但可与 Stäubli 元件插合的连接器和, 以及其他制造商声称“与 Stäubli 兼容”的连接器和, 均不符合长期稳定安全的电连接要求。出于安全考虑, 上述产品不得与 Stäubli 元件插合在一起。因此, Stäubli 对此类连接器 (即未经 Stäubli 批准) 与 Stäubli 元件插合而造成的任何损失不承担任何责任。

Safety instructions

These assembly instructions and the assembly steps and instructions described are an integral part of and prerequisite for certification by TÜV and UL.

The products may be assembled and installed by electrically skilled or instructed persons duly observing all applicable safety regulations.
Stäubli Electrical Connectors (Stäubli) does not accept any liability in the event of failure to observe these warnings.

Use only the components and tools specified by Stäubli. In case of self-assembly, do not deviate from the preparation and assembly instructions as stated herein, otherwise Stäubli cannot give any guarantee as to safety or conformity with the technical data. Do not modify the product in any way.

Connectors not originally manufactured by Stäubli which can be mated with Stäubli elements and in some cases are even described as "and/or MC4-compatible" by certain manufacturers do not conform to the requirements for safe electrical connection with long-term stability, and for safety reasons must not be plugged together with Stäubli elements. Stäubli therefore does not accept any liability for any damages resulting from mating such connectors (i.e. lacking Stäubli approval) with Stäubli elements.



IEC 60417-6042
注意电击风险

Caution, risk of electric shock

请在断电状态下工作
操作电气装置时, 请遵守五项安全规定。
各电气装置确定后, 应按照规定顺序执行以下五项基本要求 (除非另有必要理由):
- 完全分离;
- 确保不会重新连接;
- 确认无工作电压;
- 进行接地和短路;
- 针对临近带电部件提供防护。
任何从事此工作活动的人员均应具备电气技能或受过此方面指导, 或者由同等能力的人员监督。
来源: EN 50110-1:2013

最终应用时, 还应检查电击防护。

Work in a de-energized state
Follow the five safety rules, when working on electrical installations.
After the respective electrical installations have been identified, the following five essential requirements shall be undertaken in the specified order unless there are essential reasons for doing otherwise:
- disconnect completely;
- secure against re-connection;
- verify absence of operating voltage;
- carry out earthing and short-circuiting;
- provide protection against adjacent live parts.
Any person engaged in this work activity shall be electrically skilled or instructed, or shall be supervised by such a person.
Source: EN 50110-1:2013

Protection against electric shock shall be checked in the end-use applications too.



IEC 60417-6070
在负载下请勿断开连接

Do not disconnect under load

在负载下断开: 禁止在负载下断开光伏连接器。可通过关闭直流/交流转换器或切断交流电路, 使其处于无载状态。

Disconnect Under Load: PV plug connections must not be disconnected while under load. They can be placed in a no load state by switching off the DC/AC converter or breaking the AC circuit.

安全指令

Safety instructions



ISO 7000-0434B
注意

Caution

每次使用连接器前,需提前检查外部是否有缺陷(尤其是绝缘层)如有安全疑虑,必须咨询专业人员或更换连接器。

Each time the connector is used, it should previously be inspected for external defects (particularly the insulation). If there are any doubts as to its safety, a specialist must be consulted or the connector must be replaced.

连接器的防水功能可参考相关产品的IP保护等级。但是,它们不适合长期在水下使用。
请勿将连接器直接置于屋顶防水层。

The plug connectors are watertight in accordance with the product specific IP protection class. However, they are not suitable for continuous operation under water. Do not place the plug connectors directly on the roof membrane.

所述额定电压为最大电压值,且仅适于电缆连接器。电缆线束的最终额定电压取决于部件中最低的最大额定电压,以及对其进行评估和认证的相关标准。

Stated voltage ratings are maximum values and pertain only to the cable couplers. The final voltage rating of a cable lead assembly or harness is dictated by the lowest maximum voltage rating of any component contained in the assembly and the relevant standards to which they have been evaluated and certified.

未插合状态的连接器必须使用密封盖(32.0176用于插座,32.0717用于插头)防潮防尘。被污染的公母连接器不应插合使用。

Unmated plug connectors must be protected from moisture and dirt with a sealing cap (32.0716 for sockets and 32.0717 for plugs). The male and female parts must not be plugged together when soiled.

部件不得承受永久性机械拉伸载荷。根据本地电气规范与标准,电缆应使用扎带固定。

The components must never be subjected to a permanent mechanical tensile load. The cable should be fastened with cable ties according to the local Electrical Code standards and norms.

务必遵守规定的安装位置。

The defined mounting position must be complied with.

确认使用正确的编码。

Be sure to use the right coding for your application.

部件和包装材料并非玩具;若吞食小零件可能有窒息危险。包装材料有造成窒息的危险。

Components and packaging materials are not toys; small parts can pose a choking hazard if swallowed. Packaging material can pose a risk of suffocation.

产品使用须严格依照技术参数中给出的规范(例如提供充分的背部通风以确保连接器处于正常的工作温度范围)。

Use only in accordance with the specification provided in the technical data (e.g. compliance with approved temperatures by providing sufficient back ventilation).



产品使用说明或技巧
Useful hint or tip

更多技术参数请见产品目录。

For further technical data please see the product catalog.

存放须知

我们建议将连接器部件存放在温度-30°C 至 60°C, 相对湿度小于 70%的环境中。

部件不能暴露在因降雨、霜降等造成的潮湿环境中。确保单个部件不与酸、碱、汽油、丙酮或其他任何可能影响材质的化学物质接触。

满足以上条件, 则部件自出厂之日起最多可存放两年。

应用范围

光伏连接器及相应工具的预期应用是安全应用及在技术上正确装配连接器的基本要求。

光伏连接器应仅用于光伏电源转换器或光伏发电机(如光伏组件及其连接点和现场接线)。只允许在第 1 页所述的技术规格内应用。只允许合格且经验丰富的人员使用 Stäubli 发放的工具进行装配和应用, 同时应考虑此装配说明、安装标准 DIN VDE-0100-712 (IEC 60364-7-712) 以及国家及国际安全法规。

非恰当使用举例

- 未遵守安全规则
- 未遵守装配说明的安全说明
- 使用非 Stäubli 制造或认可的连接器的

非恰当使用的危害

- 触电导致人员受伤
- 电弧导致失明或严重危险

注意

使用者有责任穿着合适的防护装备工作

Note on storage

We recommend that you store connector components at a temperature between -30°C and +60°C and with a relative humidity of less than 70%.

The components must not be exposed to moisture due to direct rainfall, condensation, etc. Ensure that the individual components do not come into contact with acids, alkalis, gases, acetone, or any other chemical substances that could impact the materials used.

If these conditions are met, the components can be stored for a maximum period of up to two years from the date of manufacture.

Intended use

The intended application of the PV-connector and the corresponding tools is the basic requirement for a safe application and technically correct assembled connectors.

The PV-connector shall only be used on photovoltaic power converters or photovoltaic generators (e.g. photovoltaic modules and their contacts and field wiring). Application is only permitted within the technical specifications.

Assembly and application is only permitted by electrically skilled or instructed persons with tools which have been released by Stäubli, taking this assembly instruction into consideration as well as the installation standard DIN VDE-0100-712 (IEC 60364-7-712) and all national and international safety legislations.

Examples of unintended use

- Failure to observe safety regulations
- Failure to observe the safety instructions of these assembly instructions
- Use of plug connectors not made or approved by Stäubli

Dangers of unintended use

- Injury to persons as a result of electric shock
- Blindness and or fire hazard due to arcing

Note

The wearing of suitable personal protective equipment (PPE) is in the responsibility of the user.



①

所需工具

(ill. 1)
剥线钳PV-AZM...包括内置刀片和六角扳手A/F 2,5 mm。

电缆截面积 1,5/2,5/4/6 mm²
型号 PV-AZM-1.5/6
订货号 32.6027-156

注意事项:
i 操作说明 MA267,
www.staubli.com/electrical

Tools required

(ill. 1)
Stripping pliers PV-AZM... incl. built-in wire stripping blade as well as Allen key 2,5 mm.

Cable cross section: 1,5/2,5/4/6 mm²
Type: PV-AZM-1.5/6
Order No.: 32.6027-156

Note:
i Operating instructions MA267,
www.staubli.com/electrical



②

(ill. 2)
压接钳PV-CZM...包括定位块和压模

压接范围:
1,5/2,5/4 mm² (14/12 AWG)
型号 PV-CZM-18100
订货号 32.6020-18100

压接范围:
2,5/4/6 mm² (14/12/10 AWG)
型号 PV-CZM-19100
订货号 32.6020-19100

压接范围:
4/10 mm² (12 AWG)
型号 PV-CZM-20100
订货号 32.6020-20100

注意事项:
i 操作说明 MA251,
www.staubli.com/electrical

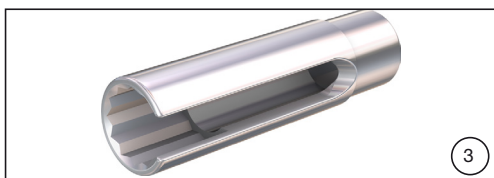
(ill. 2)
Crimping pliers PV-CZM... incl. locator and crimping die.

Crimping ranges:
1,5/2,5/4 mm² (14/12 AWG)
Type: PV-CZM-18100
Order No. 32.6020-18100

Crimping ranges:
2,5/4/6 mm² (14/12/10 AWG)
Type: PV-CZM-19100
Order No. 32.6020-19100

Crimping ranges:
4/10 mm² (12 AWG)
Type: PV-CZM-20100
Order No. 32.6020-20100

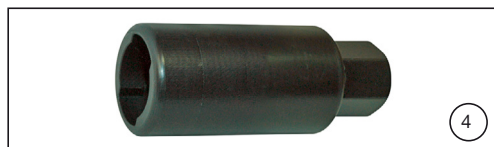
Note:
i Operating instructions MA251,
www.staubli.com/electrical



③

(ill. 3)
插座扳手
PV-WZ-AD/GWD,
订货号 32.6006

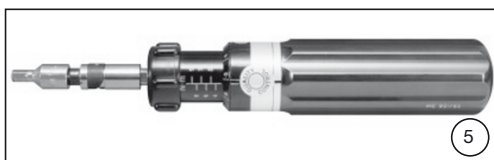
(ill. 3)
Socket wrench insert
PV-WZ-AD/GWD,
Order No. 32.6006



④

(ill. 4)
插座扳手
PV-SSE-AD4
订货号 32.6026

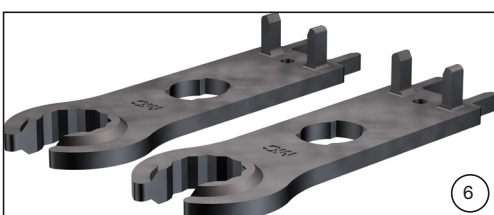
(ill. 4)
Socket wrench insert
PV-SSE-AD4
Order No. 32.6026



⑤

(ill. 5)
扭矩扳手 1/2"
最大 6 Nm (精度 ± 6 %)

(ill. 5)
Torque wrench 1/2"
Max. 6 N m (precision ± 6 %)



⑥

(ill. 6)
PV-MS 开口扳手
1套=2片
订货号 32.6024

(ill. 6)
Open-end spanner set PV-MS
1 set = 2 pieces
Order No. 32.6024



7

(III. 7)
PV-MS-PLS 开口扳手
订货号 32.6058

i 注意事项:
操作说明 MA270,
www.staubli.com/electrical

(III. 7)
Open-end spanner PV-MS-PLS
Order No. 32.6058

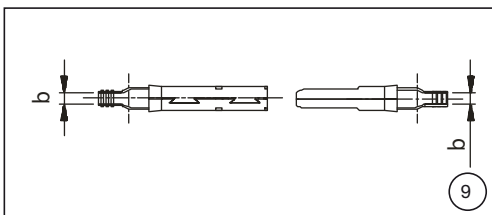
i Note:
Operating instructions MA270,
www.staubli.com/electrical



8

(III. 8)
PV-PST 测试针
订货号 32.6028

(III. 8)
Test plug PV-PST
Order No. 32.6028



剥线

可以连接5级和6级单芯多股结构导线。

(ill. 9, Tab. 1)
检查尺寸b, 见表1。

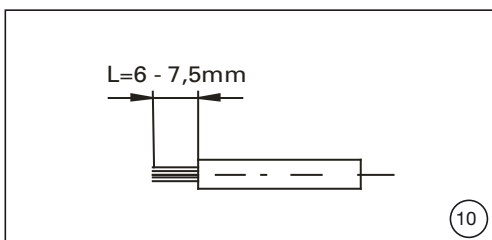
Stripping

Cables with a strand construction of classes 5 and 6 can be connected.

(ill. 9, Tab. 1)
Check dimensions b, see Tab. 1.

Tab. 1

b: 控制尺寸 b: Control dimension	导线截面积 Conductor cross section		型号 Type	
	mm	mm ²		
~ 3	1,5 – 2,5	14	PV-ADSP4-S2/2,5 PV-ADSP4-S2-UR/2,5	PV-ADBP4-S2/2,5 PV-ADBP4-S2-UR/2,5
~ 5	4 – 6	12/10	PV-ADSP4-S2/6 PV-ADSP4-S2-UR/6	PV-ADBP4-S2/6 PV-ADBP4-S2-UR/6
~ 4,4	10	-	PV-ADSP4-S2/10	PV-ADBP4-S2/10



(ill. 10)
剥除电缆外层, 剥除的长度为 6.0 至 7.5 mm。

注意：
在剥线时请勿切断里面的铜丝

(ill. 10)
Strip cable to dimension 6,0 to 7,5 mm.

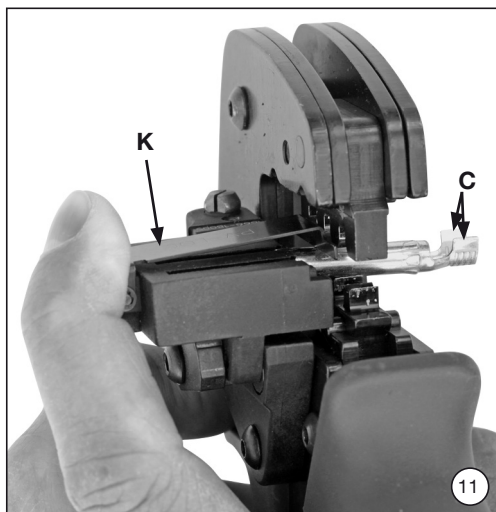
Attention
Do not cut individual strands when stripping!

压接

- (ill. 11)**
- 打开夹子 (K) 并保持。
 - 将触头置于适当的横截面范围内。
 - 转动触头的压接片朝上。
 - 松开夹子 K。
 - 触头就固定好了。

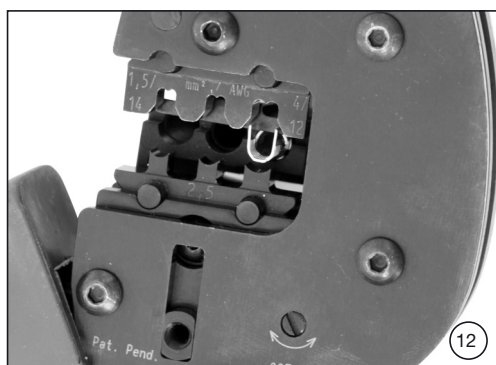
Crimping

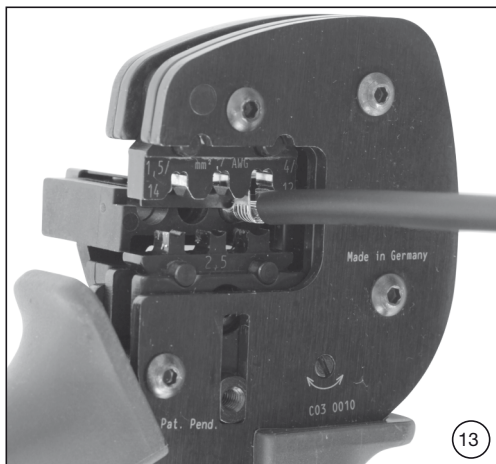
- (ill. 11)**
- Open and hold the clamp (K) .
 - Place the contact in the appropriate cross-section range.
 - Turn the crimping flaps upwards.
 - Release clamp (K).
 - The contact is fixed.



(ill. 12)
轻压压接钳直到触头的压接片完全接触到压模。

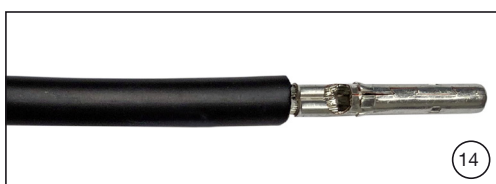
(ill. 12)
Press the pliers gently together until the crimping flaps are properly located within the crimping die.





(ill. 13)
插入剥除外层后的电缆末端,使电缆导线与定位块接触。完全合上压接钳。

(ill. 13)
Insert the stripped cable end until the cable strands come up against the locator. Completely close the crimping pliers.



(ill. 14)
根据 IEC 60352-2:2006 + A1:2013 标准,目视检查压接。

(ill. 14)
Visually check the crimp according to the criteria written in IEC 60352-2:2006 + A1:2013.

确认事项:

- 所有电缆导体都被压入压接套中
- 压接套未变形且没有缺少任何部分
- 压接形状对称
- 在连接侧或压接侧,导线可见。

Confirm that:

- All of the strands have been captured in the crimp sleeve
- The crimping sleeve is not deformed or missing any portion of the crimping flaps
- That the crimping is symmetrical in form
- A “brush” of conductor strands are visible on the contact side of crimp.

关于压接的特殊安全注意事项

Special safety notes regarding crimping

⚠ 危险

剥线时如果绝缘皮被破坏,请勿压接电缆!
一旦电缆绝缘皮损坏,损坏部分必须切断去掉并重新剥线。

⚠ Danger:

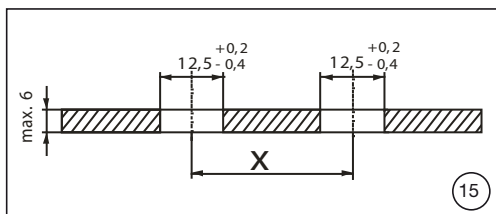
Do not crimp cables with insulations that were damaged while stripping!
In case of damage at the cable isolation the damaged cable section has to be cut off and removed. The cable has to be stripped again.

● 说明

请确保外壳厚度不小于2 mm且最大不超过6 mm。在外壳厚度小于2 mm的情况下,验证过程需由客户来完成。

● Note:

Ensure a housing wall thickness not less than 2 mm and a maximum of 6 mm. In case of using a wall thickness below 2 mm the validation process has to be done by the customer.



插座安装

(ill. 15)
平板钻孔。钻孔的建议尺寸见示意图(官方要求的尺寸12,5 +0,2/-0,4 mm 是可行的,但需要在终端用户使用时进行验证)。随后,所有钻孔边缘的毛刺需要清除。

Installation of receptacles

(ill. 15)
Drill the panel wall.
Recommended bore dimension see in the sketch. (the formally indicated dimension 12,5 +0,2/-0,4 mm is possible, but shall be verified in the end use). Subsequently, burrs must be removed from the edges of all bores!

我们建议,无论水平或垂直结构,间隙值 (X) 至少要有25 mm。

For both horizontal and vertical mounting a spacing (X) of at least 25 mm is recommended.



(iii. 16)

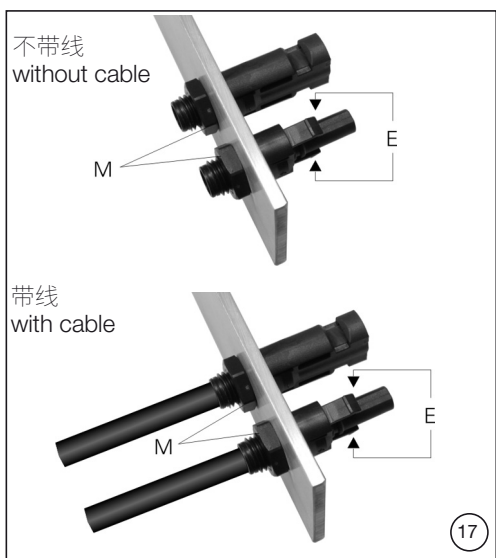
⚠ 注意
在安装塑料件时，必须要有垫圈。

⚠ 危险
如果没有垫圈或者安装不对，那么端口防护等级将达不到IP65和IP68。

(iii. 16)

⚠ Attention:
Before mounting the plastic insulations through the bore, the gasket must be located on the insulation.

⚠ Danger:
In case of lacking gasket or incorrect mounting, the ingress protection IP65 and IP68 will be compromised.



(iii. 17)

● 说明
安装塑料件E，确保其可以插合或分离。然后使用扭矩扳手拧紧螺帽M。典型值为2 N m¹⁾。需要由终端用户根据不同的外壳去验证合适的扭矩。

¹⁾ 我们强烈建议对每一把使用的扳手进行校准！

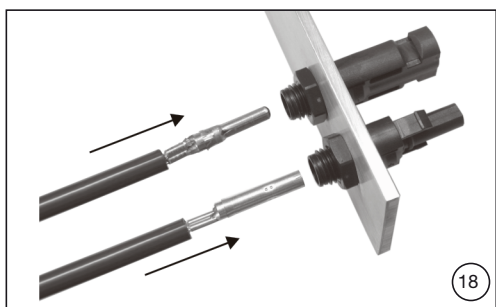
在安装位置，平垫圈必须放在外壳的外侧。
安装后目测检查时，确保没有破裂，没有折痕以及其他干扰物存在。

(iii. 17)

● Note:
Position the plastic parts (E) so that they can be plugged and unplugged. Screw on the nuts (M) and tighten them with the torque wrench. Typical values lie at 2 N m¹⁾. The appropriate torque has to be verified in the end use according to the respective housing

¹⁾ We recommend precisely following the calibration procedures defined for each specific torque wrench used!

In mounting position, the flat gasket must lie even on the outer side of the mounting surface.
During a visual check after assembly, no cracks, foldings or other disturbances should exist!



(iii. 18)

将压接好的触头插入公母面板插座的绝缘外壳中，直至啮合。

轻轻拉动线缆以检查金属芯是否正确啮合。

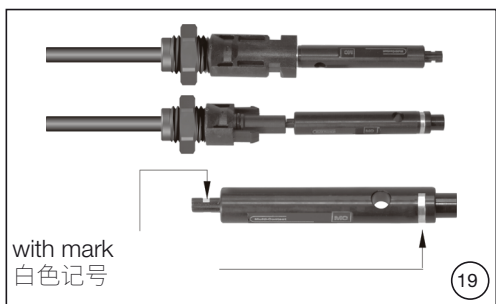
(iii. 18)

Insert the crimped-on contact into the insulator of the male or female coupler until engaged.

Pull gently on the lead to check that the metal part is correctly engaged.

安装检查

Assembly check

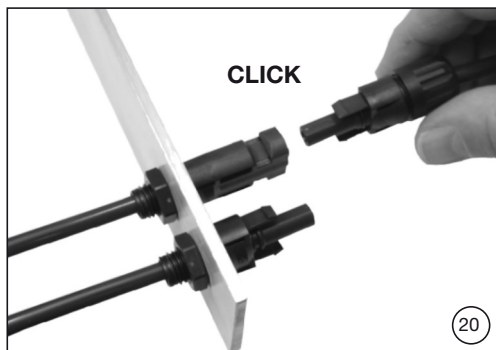


(iii. 19)

把测试针相应的一端插入面板插座或者面板插头直到顶住。
如果金属芯安装正确，那么测试针上的白色标志必然清晰可见。

(iii. 19)

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

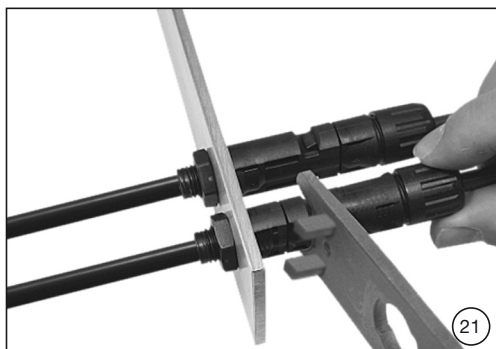


插入和拔出
带安全锁扣或不带安全锁扣PV-SSH4

插入
(ill. 20)
插入相应的耦合器部分,直至啮合。回拉耦合器电缆以便确认公母连接器两部分是否正确啮合。

Plugging and unplugging
(without and with safety lock clip PV-SSH4)

Plugging
(ill. 20)
Plug the parts of the cable coupler together until engaged. Check correct engagement by pulling on the cable coupler.



拔出(不带安全锁扣PV-SSH4)
(ill. 21)
将解锁销 PV-MS 或 PV-MS-PLS 插入插座的锁箍中,并解锁。

Unplugging without PV-SSH4
(ill. 21)
Push the unlocking pins of PV-MS or PV-MS-PLS onto the locking clips of the socket and separate the coupling.

拔出(带安全锁扣PV-SSH4)
(ill. 22)
将解锁销 PV-MS 或 PV-MS-PLS 推入 PV-SSH4 的开口中,插入插座的锁箍中,并解锁。

Unplugging with PV-SSH4
(ill. 22)
Push the unlocking pins of PV-MS or PV-MS-PLS into the openings provided in PV-SSH4 and onto the locking clips of the socket and separate the coupling.



技术参数	Technical data	
型号	Type designation	公和母面板插座MC4 Female and male panel receptacle MC4
连接系统	Connector system	Ø 4 mm
额定电压	Rated voltage	DC 1000 V ¹⁾ / DC 1250 V ²⁾ (IEC) DC 600 V / DC 1500 V (UL)
额定电流(85°C)	Rated current (85°C)	17 A (1,5 mm ²) 22,5 A (2,5 mm ² ; 14 AWG) 39 A (4 mm ² , 12 AWG) 45 A (6 mm ² , 10 AWG) 51 A (10 mm ²)
额定脉冲电压	Rated impulse voltage	12 kV (1000 V) / 16 kV (1250 V)
环境温度范围	Ambient temperature range	-40 °C...+85 °C
温度上限(IEC)	Upper limiting temperature (IEC)	105 °C (IEC)
防护等级, 已插合 未插合	Degree of protection, mated unmated	IP65; IP68 (1 m/1 h) IP2X
过压类别/污染等级	Overvoltage category / Pollution degree	CATIII / 3
连接器的接触电阻	Contact resistance of plug connectors	0,35 mΩ
连接器的公母极性	Polarity of the connectors	插座 / Socket = Plus / positive 插头 / Plug = Minus / negative
锁紧系统	Locking system	嵌入式 / Locking type
安全等级	Safety class	II
连接系统	Contact system	MULTILAM
连接类型	Type of termination	压接 / Crimping
警告	Warning	不要在负载下断开连接 Do not disconnect under load
触头材质	Contact material	铜、镀锡 / Copper, tin plated
绝缘材料	Insulation material	PC / PA
阻燃等级	Flame class	UL-94 V0
依据 IEC 62852:2014 并由 TÜV-Rheinland 认证	TÜV-Rheinland certified according IEC 62852:2014	R60127181
依据 UL6703 并由 UL 认证	UL certified according UL6703	E343181
依据 UL6703 并由 CSA 认证	CSA certified according UL6703	250725

¹⁾ PV-ADSP4-S2... / PV-ADBP4-S2... 以及/as well as PV-ADSP4-S2-UR.. / PV-ADBP4-S2-UR.. 电缆/with PV-1500 DC-F Cable (2PFG.1990/05.12)

²⁾ PV-ADSP4-S2... / PV-ADBP4-S2... 以及/as well as PV-ADSP4-S2-UR.. / PV-ADBP4-S2-UR.. 电缆/with PV1-F Cable (2PFG.1169/08.07)

备注 / Notes:

制造商/Producer:
Stäubli Electrical Connectors AG
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