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1. 安全说明 Safety Instruction

该产品只能由有相应资质的或经过专家培训的专业人员安装，安装过程中需要遵守所有安全规范。天合光能不承担对于因不遵守这些警告而产生的任何责任。

The products may be installed only by suitably qualified and trained specialists with due observance of all applicable safety regulations. Trina Solar declines any liability in the event of failure to observe these warnings.

1.1 警告 Warning

- 1.1.1** 仅可使用天合光能指定的零件和工具。对于自行装配，请务必遵守本文所述的准备和安装的说明，否则天合光能不予保证对于产品的安全性及技术参数的一致性。对于产品请勿做任何形式的修改。

Use only the components and tools specified by Trina Solar. Do not deviate from the preparation and assembly procedures described here, since in this event, in the situation of self-assembly, no guarantee can be given as to safety or conformity with the technical data. Do not modify the product in any way.

- 1.1.2** 必须与天合认可的连接器的连接，否则天合光能不承担任何责任。

Connector must be mated with connector qualified by Trina, otherwise Trina Solar will disclaim any responsibility.

- 1.1.3** 不能在有负载的情况下插拔连接器。Do Not Disconnect under Load.

1.2 通用安全 General Safety

- 1.2.1** 确认终端产品有防电击功能并确认其使用者采取了防电击措施。

Protection from electric shock must be assured by the end product and its user.

- 1.2.2** 为防止电击，在安装和拆卸连接器时必须断开电源。

To prevent electric shock, must be disconnected when the connector is installed and disassembled.

- 1.2.3** 连接器不能承受持续的机械拉伸，电缆应该由电缆扎带固定。

The plug connection must not be subjected to continuous mechanical tension. The cable should be fixed with cable binders.

- 1.2.4** 产品不得在含有烃、酚、酮、氨合物等与塑料有腐蚀的环境中使用。安装过程中，禁止在连接器里添加或涂抹任何油脂及润滑剂。

Do not use under hydrocarbon, phenol, Ammine and plastic corrosive environment.

During installation process, do not add any grease and lubricant in the connector.

1.2.5 不要将连接器直接放在屋顶表面。

Do not place the plug connectors directly on the roof membrane.

1.3 操作安全 Handling Safety

1.3.1 该连接器仅适用于B类和C类多股铜导线（见NFPA NEC 70第9章，表10）。建议使用光伏专用线缆，镀锡铜芯，双层绝缘，绝缘材料为XLPE。不建议使用无镀锡电缆或PVC电缆，否则天合光能不承担任何责任。

The connector is only applicable to the B and C types of copper wires (see 9 chapters of NFPA NEC 70, table 10). It is recommended to use special photovoltaic cable, tin plated copper core, double insulation, and insulating material is XLPE. Trina prohibits the use of either untinned cable PVC cables, otherwise Trina Solar will disclaim any responsibility.

1.3.2 未插合状态的连接器必须使用防尘塞，以防止灰尘和水进入。被污染的公母插头不能插合。

Unmated plug connectors must protected from moisture and dirt with a sealing cap.

The male and female parts must not be plugged together when soiled.

1.3.3 插合部件防水等级IP68。不能长久置于水下使用。

The plug connectors are watertight in accordance with IP68 protection class. However, they can't be continuous operation underwater.

1.3.4 对产品有影响的常见化学品清单如下，对于表中未列明的化学品，需经天合确认无影响后再使用。

Below is the list of common chemicals that can affect the products. For other chemicals that are not listed in the table, should be confirmed with Trina when you use.

序号 NO.	化学品名 Chemical Name
1	润滑油 Lubricating oil
2	防锈油 Rust-proof oil
3	冲压油 Stamping oil

4	黄油 Grease
5	机油 Engine oil
6	柴油 Diesel
7	食用油 Cooking oil
8	WD40
9	香蕉水 Banana oil
10	油性封孔 Oil sealing agent
11	乙酸乙酯 Ethyl acetate

1.3.5 常温下储存运输，避光、防水、防尘。不可与有影响的化学品存放在一起。为组装的连接器建议在一年内安装使用。

Storage and transportation at normal temperature. Avoiding light, waterproof and dustproof. It is not allowed to be stored with the affected chemicals. The plug connectors should be installed in one year.

1.3.6 天合光能有权随时对本说明书中可能出现的打印错误，产品技术改进和创新等方面作修改，这些改动恕不另行通知。同时各语言版本翻译的不详之处，请以中文版为准。最终解释权归天合光能。

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2. 技术参数 Product Specifications

连接器系统 Connector system	Φ4mm
额定电压 Rated voltage	IEC 1500V&UL 1500V
额定电流 Rated current @IEC (85℃)	41A (4.0mm ² / 12AWG) 46A (6.0mm ² / 10AWG) 55A (10.0mm ² / 8AWG)
额定脉冲电压 Rated impulse voltage	16KV
环境温度范围 Ambient temperature range	-40℃~+85℃
接触电阻 Contact resistance	≤0.5mΩ
应用等级 Application degree	Class A
防护类别 Protection class	Class II
污染等级 Pollution degree	2
防护等级 Degree of Protection	IP68 (1m, 1h), 已插合 mated IP2X, 未插合 unmated
阻燃等级 Flame class	UL94-V0
绝缘材料 Insulation material	m-PPE/PA
金属材料 Contact material	铜, 镀锡 Copper, Tin-plated
接线方式 Type of termination	压接 Crimping
锁紧系统 Locking system(UL)	嵌入式 Locking type
TUV, IEC62852	R50369705/R50385924
UL, UL6703	E486009

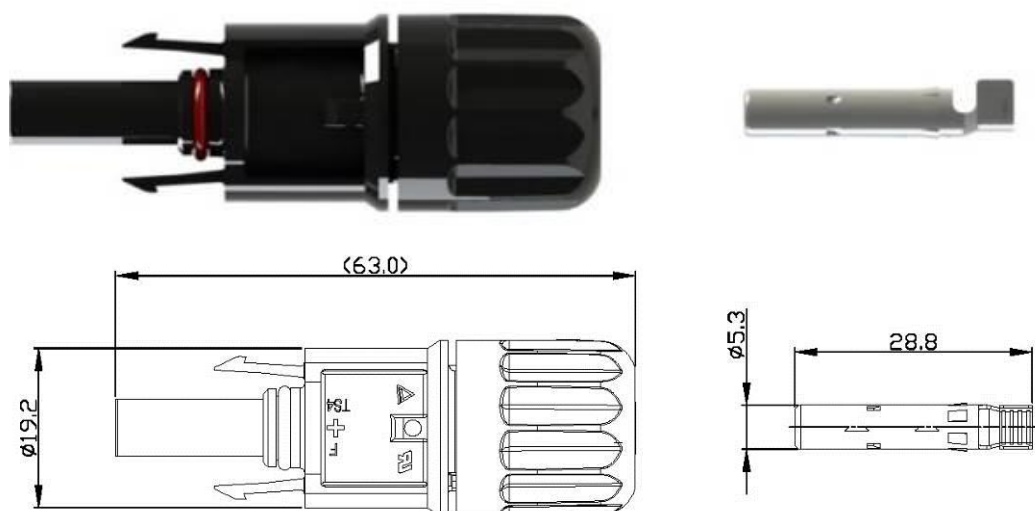
3. 产品选型表 Product Selection Form

型 号 Type	料号 P/N	电缆 外径 Cable OD	导体截面积 Conductor Cross Section		工具料号 Tool P/N							
		mm	mm ²	AWG	剥线钳料 号 Wire Stripper P/N	压接工具料 号 Rivet Plier P/N	扳手料号 Spanner P/N					
TS4-F1	70930042	4.7-6.0	4.0/6.0	12/10	70930046	70930047	70900354					
TS4-M1	70930041											
TS4-F2	70930085	5.6-6.8										
TS4-M2	70930084											
TS4-F3	70900351	6.0-6.6										
TS4-M3	70900350											
TS4-F4	70930044	6.0-7.2										
TS4-M4	70930043											
TS4-F5	70930048	7.2-8.7			70930049	70930051						
TS4-M5	70930045											
TS4-F6	70930052											
TS4-M6	70930050	10.0	8									

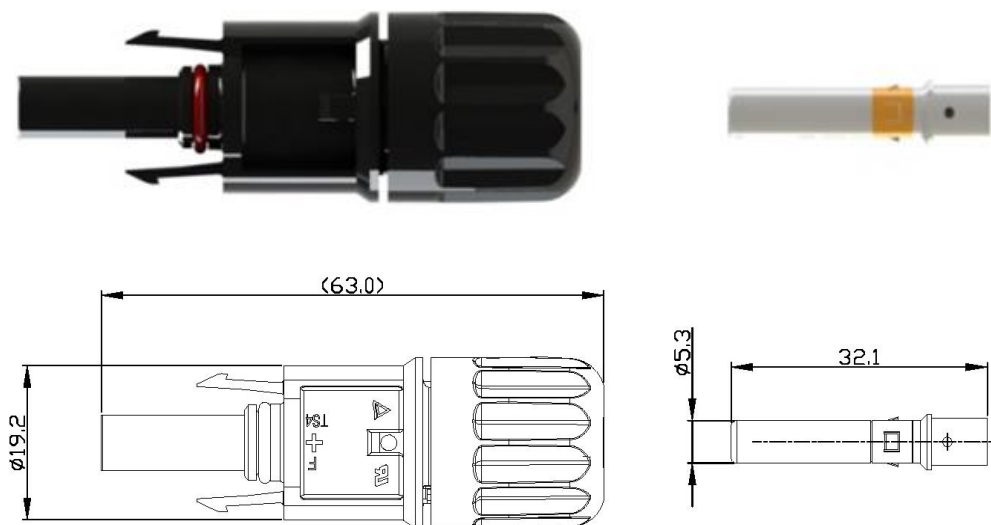
4. 连接器外观尺寸图 Connector Appearance Size Drawing

4.1 正极连接器 Positive Connector

TS4-F1、TS4-F2、TS4-F3、TS4-F4:

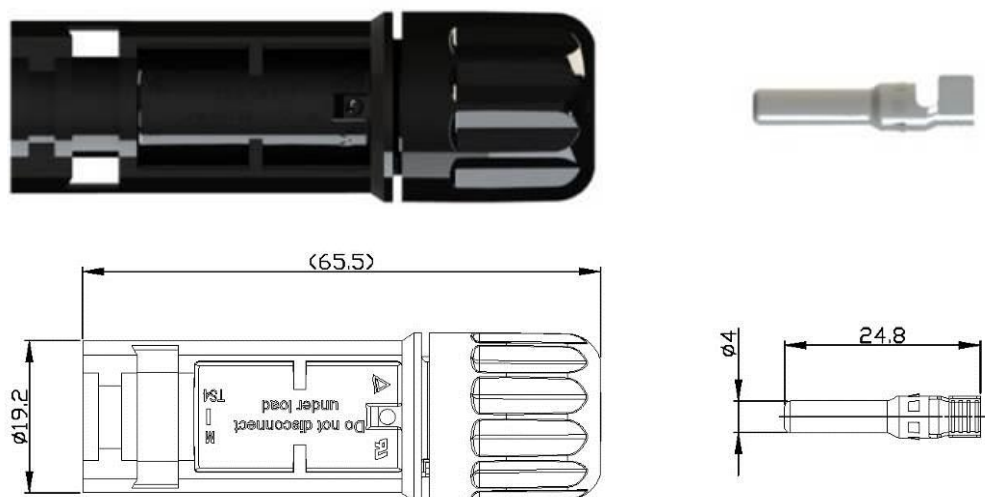


TS4-F5、TS4-F6:



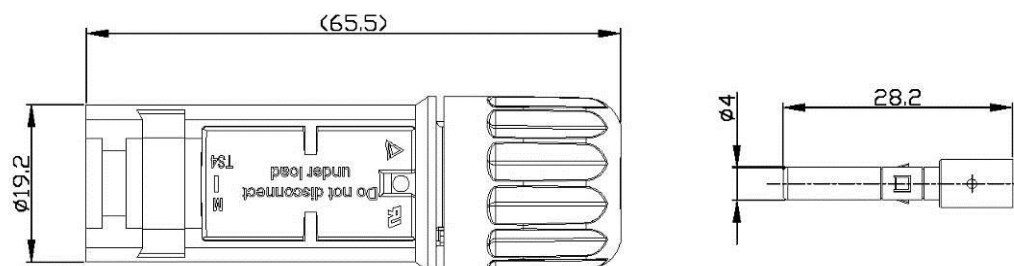
4.2 负极连接器 Negative Connector

TS4-M1、TS4-M2、TS4-M3 、TS4-M4:



TS4-M5、TS4-M6:





5. 安装 Installation

5.1 工具要求 Requirements of Tools

5.1.1 剥线钳 Wire Stripper



70930046



70930049



70930046



70930049

料号 P/N	钳口 Jaw	剥线范围 Crimping Range	
70930046	中间 Middle	4.0mm ²	12AWG
	右边 Right side	6.0mm ²	10AWG
70930049	右边 Right side	10.0mm ²	8AWG

5.1.2 铆接钳 Rivet Plier



70930047

料号 P/N	钳口 Jaw	铆接范围 Riveting Range		图片 Picture
70930047	中间 Middle	4.0mm ²	12AWG	
	右边 Right side	6.0mm ²	10AWG	
70930051	可调 Adjustable	4.0/6.0/ 10.0mm ²	8AWG	

5.1.3 塑料板手 Plastic Spanner



1 套 set = 2 片 pc, 料号 P/N: 70900354

5.1.4 工具箱 Tool Box

料号 P/N	70930046	70930049	70930047	70930051	70900354	图片 Picture
	数量 Qty.	数量 Qty.	数量 Qty.	数量 Qty.	数量 Qty.	

70930082	1pc	None	1pc	None	2pcs	
70930083	None	1pc	None	1pc		

5.2 组装步骤 Assembly Steps

5.2.1 剥线 Stripping



剥离电缆绝缘层。Strip the insulating layer of cable. $L=6\pm0.5\text{mm}$.

注意不要切断绝缘层下的线芯。Be attention and not to cut off the individual strands.

5.2.2 放入插针插套 Inserting pin and socket



70930047



70930051

将金属端子放在铆接工具孔内，铆接孔朝外，使金属端子的最外侧边缘与铆接口齐平。

Place the metal terminal in the hole of the riveting tool. The riveting hole is facing out. The most outer edge of the metal terminal is flat with the riveting interface.

5.2.3 铆接插针插套 Crimping pin and socket



将剥好线的线芯插入金属端子铆接孔内，需确保所有芯线都在孔内。保证金属件和电缆线的同轴度。最后按下铆接工具手柄，一直接到底，完成铆接。铆接后线缆拉力参照下表。铜丝都要被包扎。

Insert stripped cable into the rivet hole of the metal terminal, and make sure all the individual strands are in the hole. Ensure the coaxially of metal parts and cables. Finally, press the riveting tool handle and press it to the end to complete the riveting. The cable tension after riveting is referenced to the following table. All individual strands should be bandaged.

线缆规格 Cable specifications	拔出力 Cable pull-out force
4.0mm ² / 12AWG	≥312N
6.0mm ² / 10AWG	≥356N
10.0mm ² / 8AWG	≥401N

下方图例为铆接好的插针插套 The picture below are riveted pins and sockets



压接钳（70930051）根据不同规格线缆，需要先调节到相应的档位。

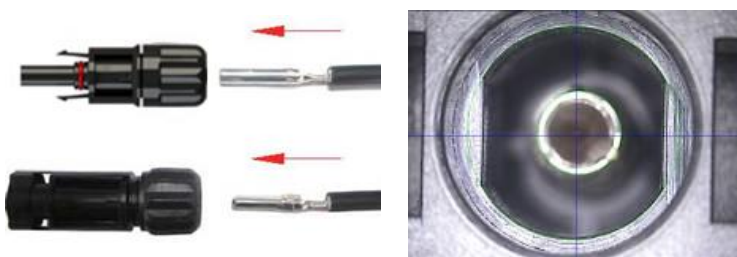
According to different specifications of the cable, you need to adjust to the corresponding gear of

Crimping pliers (70930051).



档位 Gear	线缆规格 Cable spec	连接器规格 Connector type
4	4.0mm ² /12AWG	TS4-F5/TS4-M5
6	6.0mm ² /10AWG	
8	10.0mm ² /8AWG	TS4-F6/TS4-M6

5.2.4 插入 Pushing



将铆接好的插头插入插座或插头的绝缘套，直至其啮合。轻轻拉动线缆，检查金属件是否啮合牢固。确认负极 pin 针和负极本体同轴。

Insert the crimped-on contact into the insulator until they engage. Pull gently on the lead to check that the metal part is correctly engaged. Make sure the negative pin and the negative body are coaxial.

5.2.5 安装螺帽 Install the cable



先用手预拧紧，再用塑料扳手旋紧电缆螺帽。

First screw the nut by hands, then lock tightly by plastic spanner.

型号 Type	电缆外径范围 Cable OD range	管控间隙 Control gap	参考扭力 Reference torque
TS4-F1/M1	4.7-6.0mm	0<X≤1.0mm	3±0.5 N*m
TS4-F2/M2	5.6-6.8mm		
TS4-F3/M3	6.0-6.6mm		
TS4-F4/M4	6.0-7.2mm		
TS4-F5/M5	7.2-8.7mm	1.0<X≤1.8mm	
TS4-F6/M6			

注意 1：拧螺帽时，需保证电缆线与螺帽同心。

Note 1: Ensure the concentricity of cable and cable nut when you screw cable nut.

注意 2：须确认负极 pin 针和负极本体同轴，再锁紧螺帽。

Note 2: Make sure the negative pin and the negative body are coaxial and then lock the nut.

6. 连接器对插及解锁 Connecting and Disconnecting

6.1 连接器对插 Connecting



将连接器正负极对插，直到啮合。轻轻拉动，以检查是否啮合牢固。插入力 $\leq 80\text{N}$ 。

Plug the coupling together until they engage. And pull lightly to check correct engagement.

Insertion force $\leq 80\text{N}$.

6.2 连接器解锁 Disconnecting



此插头连接，只能使用塑料板手工具解锁。

This connector must be unlocked with plastic spanner when it connected.

7. 线缆 Cable

7.1 线缆接线 Connection of Cable

电缆根部建议保留 20mm 未折弯长度，以免因线缆折弯产生的外力引起连接器密封件变形。

In order to avoid the cable sealing element deformation that a force generated by bending the wire, the cable need keep at least 20mm straight length.



Wrong way for the cable

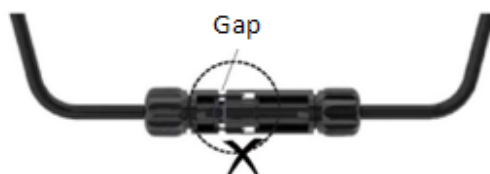


Right way for the cable

备注：请参考电缆生产商的最小弯曲半径的详细要求。

Remarks: Please refer to the detailed instruction of the min bend radius given by cable manufacturer.

7.2 接合状态 Connection Status



Incorrect joint diagram



Correct joint diagram

8. 天合光能服务网点 Trina Solar Service Point

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可以在 <http://www.trinasolar.com/cn/> 上查看、下载和打印相应的说明书。

The appropriate instructions can be viewed, downloaded, and printed at

<http://www.trinasolar.com/cn/>.