

通灵 TL-CABLE01S Pro 连接器安装手册

Tonglin TL-CABLE01S Pro Connector Installation Manual



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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。通灵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. Tonglin declines any liability in the event of failure to observe these warnings.

1.1 警告 Warning

- 1.1.1** 仅可使用通灵指定的零件和工具。对于自行装配，请务必遵守本文所述的准备和安装的说明，否则通灵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 Tonglin. 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** 必须与通灵认可的连接器的连接，否则通灵不承担任何责任。

Connector must be mated with connector qualified by Tonglin, otherwise Tonglin will disclaim any warranty responsibility.

- 1.1.3** 不能在有负载的情况下插拔连接器。在带电情况下允许插拔，但一定要切断光伏系统端电源。Do Not Disconnect under Load. Plugging and unplugging when live is permitted, but the power at the PV system must be cut off.

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, system must be disconnected from the power source when the connector is installed or disassembled.

- 1.2.3** 连接器不能承受持续的机械拉伸，线缆应该由线缆扎带固定。

The plug connection must not be subjected to continuous mechanical tension. The cable should be fixed with cable ties, avoiding any pull on the connectors.

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- 1.2.4** 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。建议使用光伏专用线缆，镀锡铜芯，双层绝缘，绝缘材料为XLPE。不建议使用无镀锡线缆或PVC线缆，否则通灵不承担任何责任。

This connector is suitable for use only with Class B and C stranded copper conductors. It is recommended to use special photovoltaic cable, tin plated copper core, double insulation, and XLPE insulating material. Tonglin prohibits the use of untinned cable PVC cables, otherwise Tonglin will disclaim any warranty 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 be protected from moisture and dirt with a sealing cap. If soiled, the male and female connectors must not be plugged together.

- 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 cannot be used for continuous operation underwater.

- 1.3.4** 连接器不得在含有烃、酚、酮、氨合物等与塑料有腐蚀的环境中使用。连接器零件不能暴露于因直接降雨、冷凝等带来的水汽中。确保各零件不能与酸、碱、瓦斯、丙酮或任何其他会影响材料使用的化学物质接触。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. 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 other chemical substances that could negatively impact the materials used. During installation process, do not add any grease and lubricant in the connector.

- 1.3.5** 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，需经通灵确

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认无影响后再使用。

Below is the list of common chemicals that can affect the products. For other chemicals not listed in the table, please confirm with Tonglin Technical Service BEFORE use (see Section#8).

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

1.3.6 储存运输，建议温度为-30℃~ +60℃，相对湿度低于70%，避光、防水、防尘。

不可与有影响的化学品存放在一起。未连接连接器建议在一年内安装使用。

We recommend TL-CABLE01S Pro connector storage and transportation temperature between be -30℃ and +60℃ and a relative humidity of less than 70%.

Storage and transportation at normal temperature must avoid direct sunlight, moisture, and dust. It is not allowed to be stored with the affected chemicals. The plug connectors should be installed within one year of delivery by Tonglin.

1.3.7 通灵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。最终解释权归通灵。

Tonglin has the rights to make certain correction for the printing errors, improvements and innovation for the products, and there will be no prior notice when these changes happen. If there was any misunderstanding for the version in

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different language, please regard Chinese version as the right one. Final explanation right belongs to Tonglin.

2. 技术参数 Product Specifications

名称 Product Name	TL-CABLE01S Pro
认证型号 Certificate Type	TL-CABLE01S Pro
认证 Certificate	TUV/UL
额定电压 Rated voltage	IEC 1500V&UL 1500V
额定电流 Rated current @IEC (85°C)	41A (4.0mm ² / 12AWG) 46A (6.0mm ² / 10AWG)
额定脉冲电压 Rated impulse voltage	16KV
环境温度范围 Ambient temperature range	-40°C~+85°C
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
金属材料 Contact material	铜, 镀锡 Copper , Tin-plated
接线方式 Type of termination	铆接 Crimping
锁紧系统 Locking system(UL)	嵌入式 Locking type
绝缘材料 Insulation material	m-PPE/PC/ PA/etc

3. 产品选型表 Product Selection Form

3.1 TL-CABLE01S Pro 连接器 TL-CABLE01S Pro PV connector

型号 Type	线缆外径 Cable OD	连接器正负极 Connector male and female		导体截面积 Conductor Cross Section	
	mm	负极 Male	正极 Female	mm ²	AWG
TL-CABLE01S Pro-F (φ 5.8)	5.3-5.7		✓	4/6	12/10
TL-CABLE01S Pro-M (φ 5.8)		✓			
TL-CABLE01S Pro-F (φ 6.9)	5.8-6.6		✓		
TL-CABLE01S Pro-M (φ 6.9)		✓			
TL-CABLE01S Pro-F (φ 7.3)	6.7-7.2		✓		
TL-CABLE01S Pro-M (φ 7.3)		✓			

注意：选择与线缆匹配的连接器的规格号，需保证导体截面积和线缆外径均在范围内。否则会影响使用，并产生安全风险。

Note: Select the connector specification and Part No. matched with the cable, and ensure that the cross-sectional area of the conductor and the OD of the cable are within the range. Otherwise, it will affect the use and create safety risks.

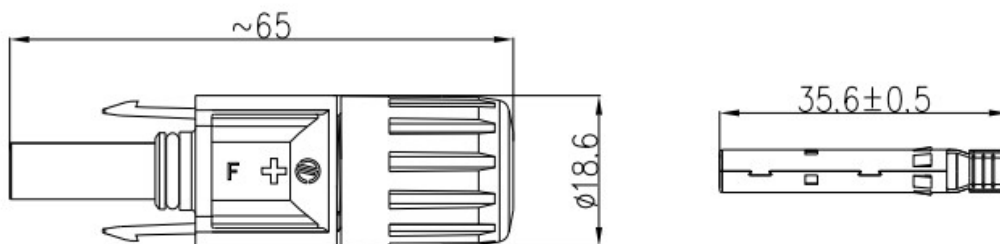
4. 连接器外观尺寸图 Connector Appearance Size Drawing

4.1 TL-CABLE01S Pro 连接器 TL-CABLE01S Pro PV connector

4.1.1 正极连接器 Positive Connector

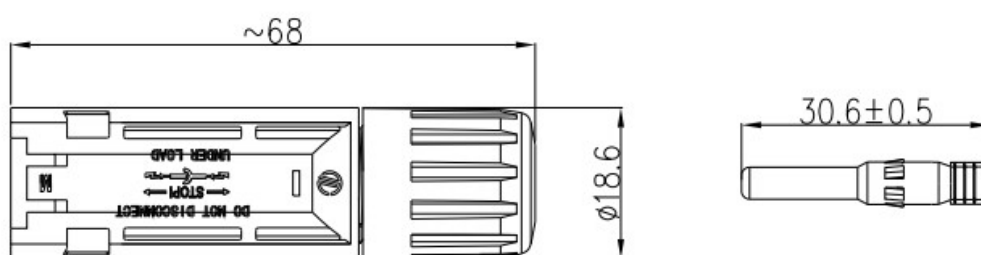
TL-CABLE01S Pro-F





4.1.2 负极连接器 Negative Connector

TL-CABLE01S Pro-M



5. 安装 Installation

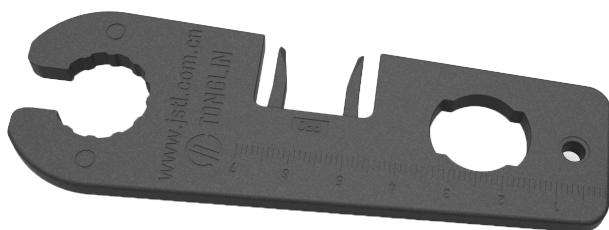
5.1.1 剥线钳 Wire Stripper



5.1.2 铆接钳 Rivet Plier



5.1.3 扳手 Unlocking Spanner

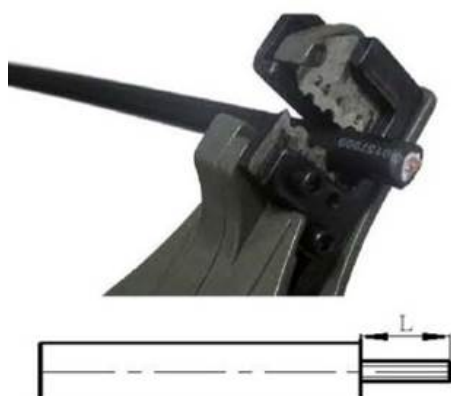


5.2 组装步骤 Assembly Steps

组装连接器时，环境温度建议为-15~+35℃。

For assembling of components we recommend an ambient temperature between -15~+35℃.

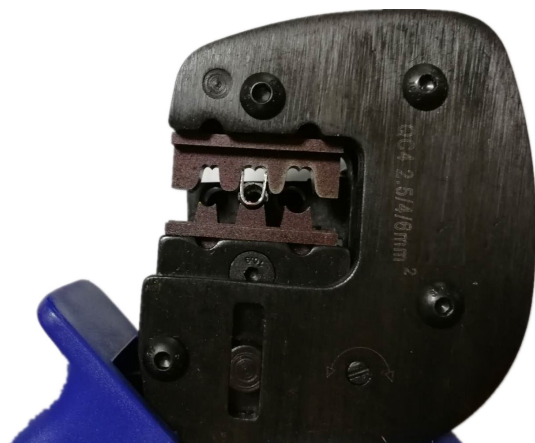
5.2.1 剥线 Stripping



剥离线缆塑料绝缘层。Strip the plastic insulating layer of cable.

注意： 不要切断和损坏线缆绝缘塑料下的铜丝线芯。**Note:** Please pay attention and do NOT cut off and damage the copper wire core under the cable insulating plastic.

5.2.2 放入插针插套 Inserting pin and socket



将金属端子（插针或插套）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 (pin or socket) 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

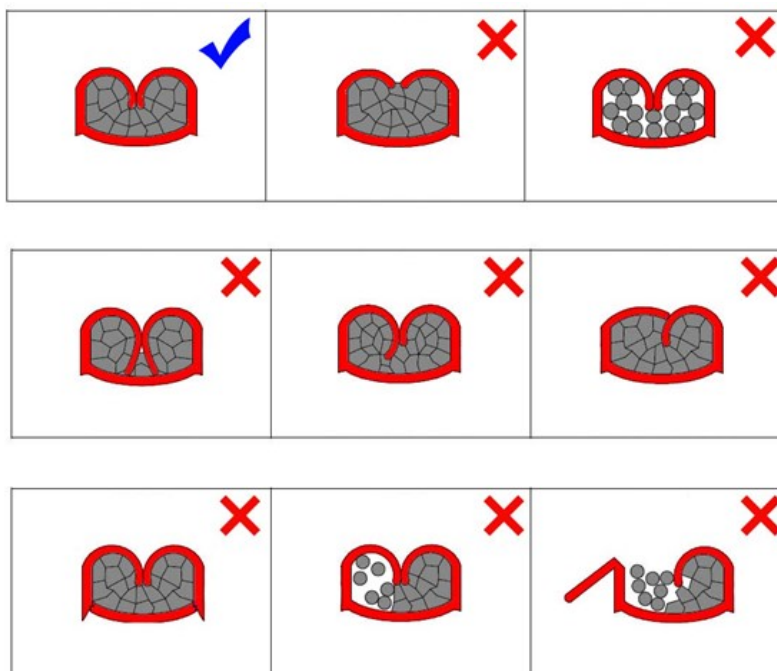


将剥好线的线芯插入金属端子铆接孔内，需确保所有芯线都在孔内。保证金属件和线缆线的同轴度。最后按下铆接工具手柄，一直按到底，完成铆接。铜丝都要被包扎。

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 all the way and press it to the end to complete the riveting. All individual strands should be crimped.

铆接质量应满足 IEC62852 及以下要求。

Qualified crimping samples must meet IEC 62852 and the following criteria.



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



5.2.4 插入 Pushing



将铆接好的金属端子插入正极或负极的塑料本体中，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 riveted metal terminal into the plastic body of the positive or negative until it engages. Gently pull the cable to check whether the metal terminals are firmly engaged. Confirm

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that the negative pin is coaxial with the negative body.

注意：在线缆及金属端子插入塑料本体前，请勿拧开螺帽，防止内部的密封件掉落或者方向装反。

Note: Before inserting the cable and metal terminal into the plastic body, do NOT unscrew the nut to prevent the internal seal from falling or installing in the opposite direction.

5.2.5 安装螺帽 Install the nut



先用手预拧紧，再用扳手旋紧线缆螺帽。

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

注意 1：锁紧螺帽时，需保证线缆线与螺帽同心。

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。

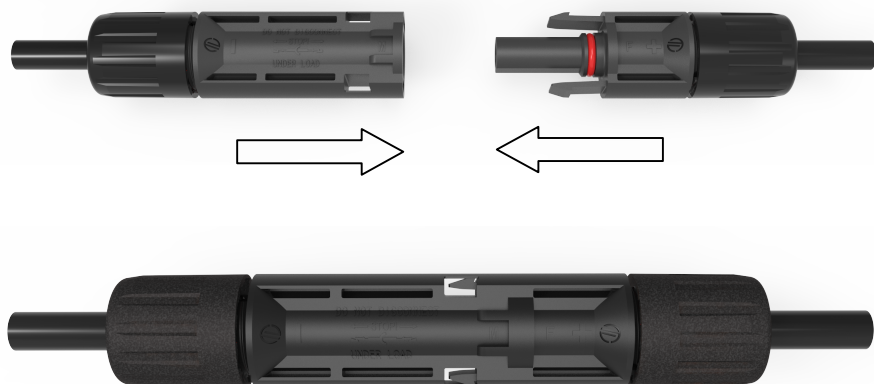
Note 2: Make sure the negative pin and the negative body are coaxial and then lock the nut.

注意 3：螺帽锁紧时需严格控制间隙 X 值。当线缆的外径偏向下限时，管控间隙应偏向控制值下限；反之，则偏向控制值上限。

Note 3: When the nut is locked, the clearance X value shall be strictly controlled. When the OD of the cable deviates to the lower limit, the control gap shall deviate to the lower limit of the control value; On the contrary, it is biased to the upper limit of the control value.

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。

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

6.2 连接器解锁 Disconnecting

6.21 用开锁器解锁



6.22 用扳手解锁



连接器正负极对插连接后，只能使用TL-CABLE01S Pro工具解锁。

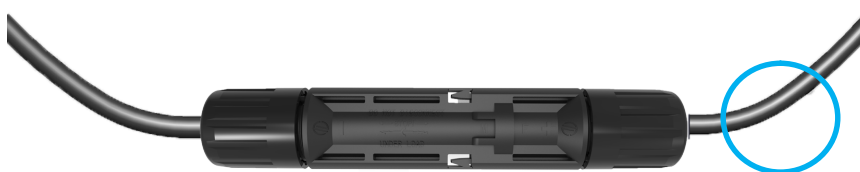
The negative and positive terminals of the connectors must be unlocked with the TL-CABLE01S Pro tool.

7. 线缆 Cable

线缆根部建议保留至少 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 deformation of the cable sealing element from that a force generated by the bending the wires, the cable should have at least 20mm straight length nearest to the connector.

See figures below.



正确的 (Right)



错误的 (Wrong)