



Trinasolar TS4 Connector and Socket Instruction Manual

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Trina Solar TS4 Connector Installation Manual



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Safety Instruction

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.

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

1.1.3 Do Not Disconnect under Load. Plugging and unplugging when life is permitted, but the power at the PV system must be cut off.

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

1.2.2 To prevent electric shock, the system must be disconnected from the power source when the connector is installed or disassembled.

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

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

1.3 Handling Safety

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

1.3.2 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 The plug connectors are watertight in accordance with the IP68 protection class. However, they cannot be used for continuous operation underwater.

1.3.4 Do not use in hydrocarbon, phenol, amine, 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 the installation process, do not add any grease and lubricant to the connector.

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

NO.	Chemical Name
1	Lubricating oil
2	Rust-proof oil
3	Stamping oil
4	Grease
5	Engine oil
6	Diesel
7	Cooking oil
8	WD40
9	Banana oil
10	Oil sealing agent
11	Ethyl acetate

1.3.6 We recommend TS4 connector storage and transportation temperature between -30°C and +60°C and 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 Trina Solar.

1.3.7 Trina Solar has the right to make certain corrections for the printing errors, improvements, and innovations for the products, and there will be no prior notice when these changes happen. If there was any misunderstanding regarding the version in a different language, please regard the Chinese version as the right one. The final explanation right belongs to Trina Solar.

Product Specifications

Connector system	Φ4mm
Rated voltage	IEC 1500V&UL 1500V
Rated current @IEC 85°C	41A 4.0mm ² / 12AWG 46A 6.0mm ² / 10AWG 55A 10.0mm ² / 8AWG
Rated impulse voltage	16KV
Ambient temperature range	-40°C~+85°C
Contact resistance	≤0.5mΩ
Application degree	Class A
Protection class	Class II
Pollution degree	2
Degree of Protection	IP68 1m 1h mated IP2X unmated
Flame class	UL94-V0
Insulation material	m-PPE/PA
Contact material	Copper, Tin-plated
Type of termination	Crimping
Locking system(UL)	Locking type
TUV , IEC62852	R50401767/R50385924/ R50508240
UL, UL6703	E486009

Product Selection Form

3.1 TS4 PV connector

Type	P/N	Cable OD	Conductor Cross Section		Tool P/N				
		mm	mm2	A” ‘wG	Wire Strippe r P/N	Rivet Plier P/N	Spanner P/N		
TS4-F1	7A000986	4.7-6.0	4.0/6.0	12/10	7A001039	7A001038	7A001040		
TS4-M 1	7A000987								
TS4-F2	7A000982	5.6-6.8							
TS4-M2	7A000983								
TS4-F3	7A002404	6.0-6.6							
TS4-M3	7A002425								
TS4-F4	7A000984	6.0-7.2							
TS4-M4	7A000985								
TS4-F5*	7A000992	7.2-8.7			10.0	8		7A001037	7A001036
T54-M5*	7A000981								
TS4-F6*	7A000990								
TS4-M6*	7A000991								
TS4-F7*	7A004375	6.6-7.2	4.0/6.0	12/10	7A001039	7A001036			
TS4-M7*	7A004378								
TS4-F8*	7A004377	5.6-6.6							
TS4-M8*	7A004376								
TS4-F9	7A002997	6.9-7.5	4.0/6.0	12/10		7A001038			
TS4-M9	7A002996								

3.2 TS4 Plus PV connector

Type	P/N	Cable O D	Conductor Cross S ection		Fool P/N		
		mm	mm2	AWG	Wirc Stripp er P/N	Rivet Mier P/N	Spanner P/ N
TS4 Plus-FI	7A004669	4.7-6.0	4.0/6. 0	12/10	7A0010 39	7A001038	7A00454 1
TS4 Plus-MI	7A004670						
TS4 Plus-F2	7A004671	5.6-6.8					
TS4 Plus-M2	7A004672						
TS4 Plus-F3	7A004673	6.0-7.2					
TS4 Plus-M3	7A004674						

Note 1 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.

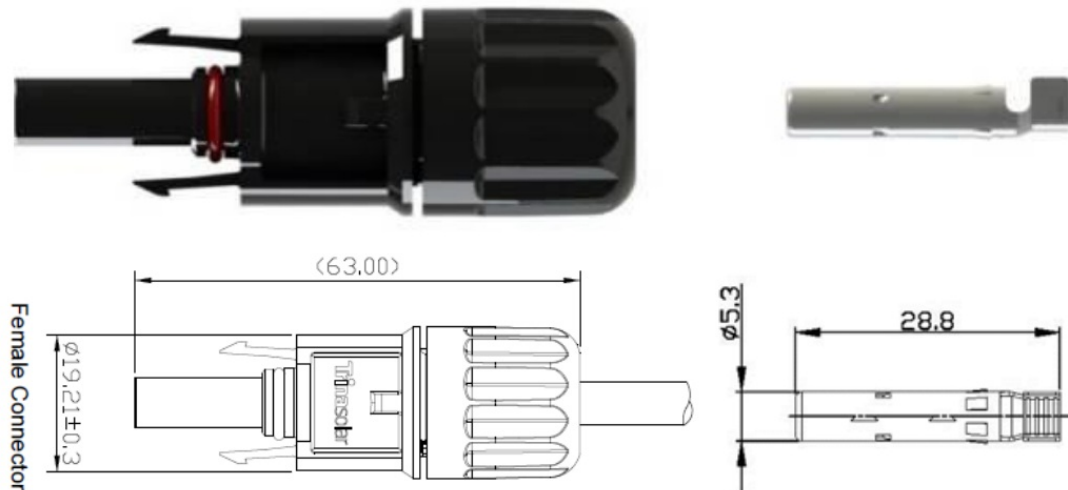
Note 2 The specification of the connector with * is an O-type metal terminal.

Connector Appearance Size Drawing

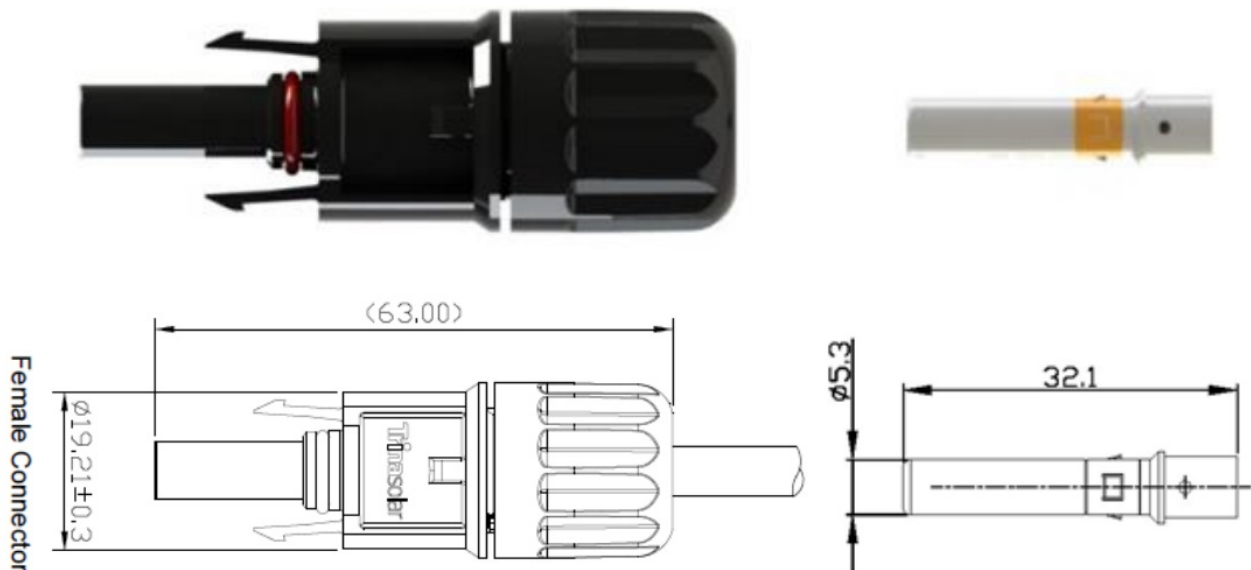
4.1 TS4 PV connector

4.1.1 Positive Connector

TS4-F1 TS4-F2 TS4-F3 TS4-F4 TS4-F9

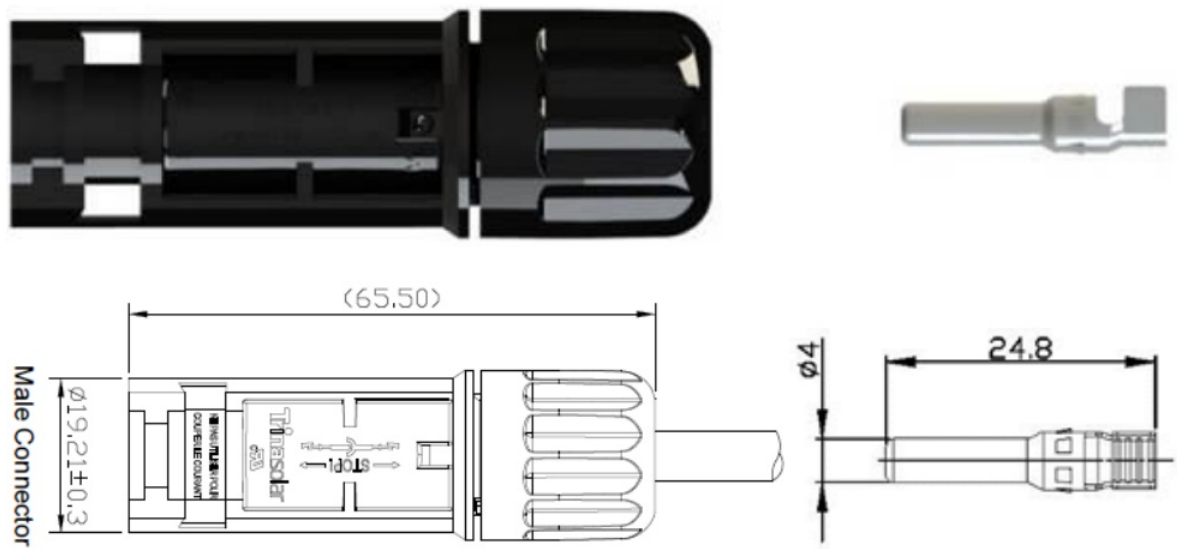


TS4-F5、TS4-F6、TS4-F7、TS4-F8:

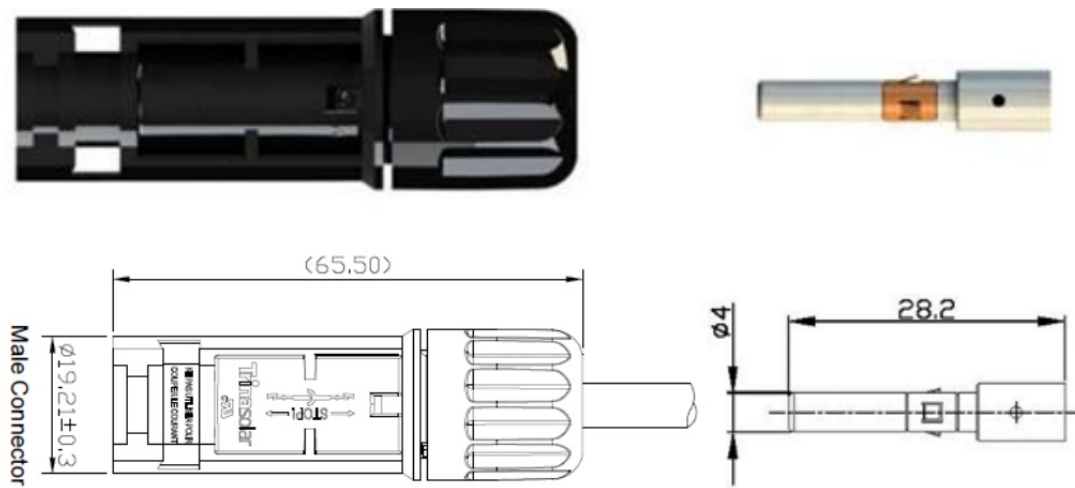


4.1.2 Negative Connector

TS4-M1 TS4-M2 TS4-M3 TS4-M4 TS4-M9



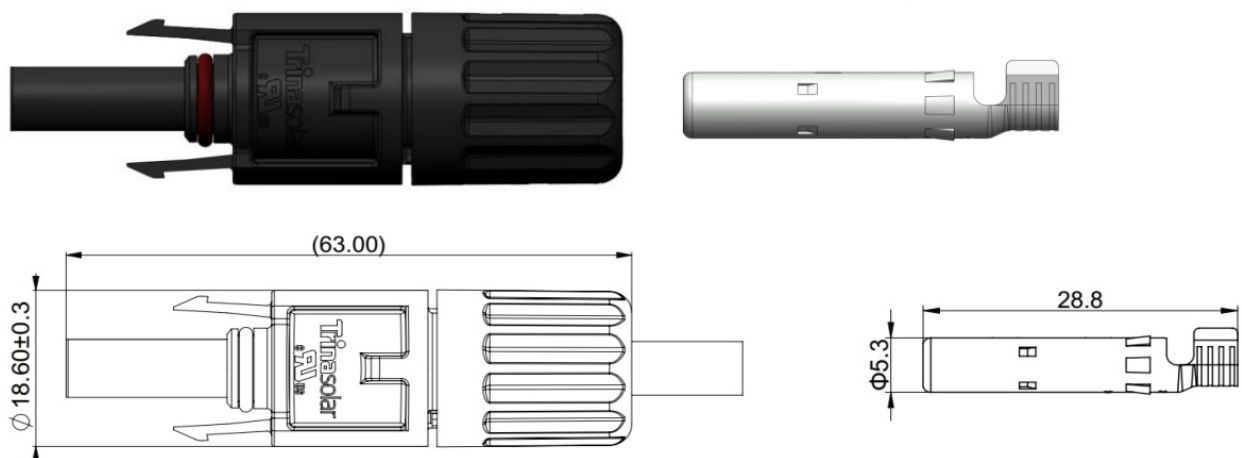
TS4-M5 TS4-M6 TS4-M7 TS4-M8



4.2 TS4 Plus PV connector

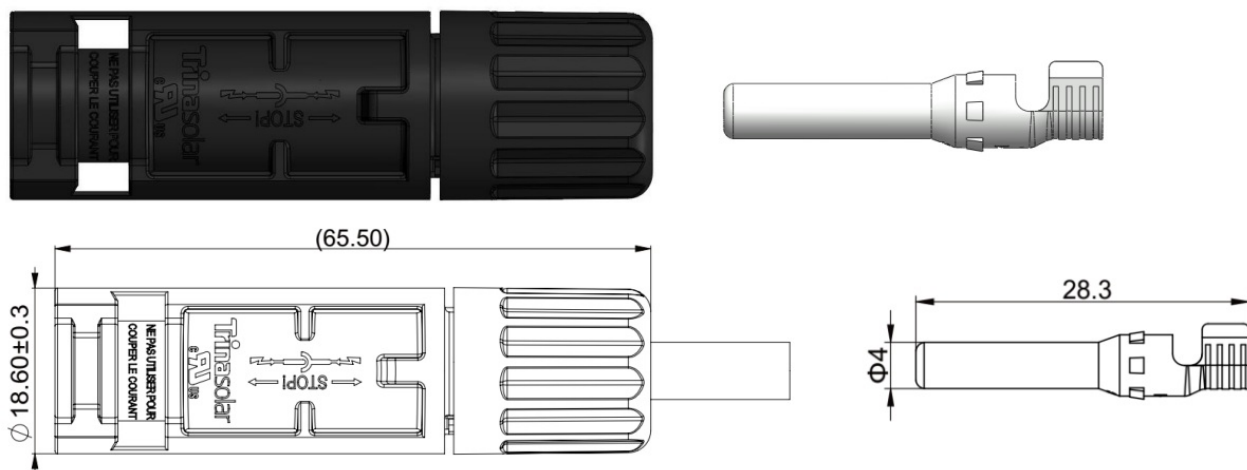
4.2.1 Positive Connector

TS4 Plus-F1 TS4 Plus-F2 TS4 Plus-F3



4.2.2 Negative Connector

TS4 Plus-M1 TS4 Plus-M2 TS4 Plus-M3



Installation

5.1 Tools Requirements

5.1.1 Wire Stripper



7A001039



7A001037



7A001039



7A001037

P/N	Jaw	Crimping Range	
7A001039	Middle	4.0mm ²	12AWG
	Right side	6.0mm ²	10AWG
7A001037	Right side	10.0mm ²	8AWG

5.1.2 Rivet Plier



7A001038



7A001036

P/N	Jaw	Riveting Range		Picture
7A001038	Middle	4.0mm ²	12AWG	
	Right side	6.0mm ²	10AWG	

7A001036	Adjustable	4	4.0mm ²	12AWG	
		6	6.0mm ²	10AWG	
		8	10.0mm ²	8AWG	



5.1.3 Plastic Unlocking Spanner



1 set =2 pc TS4 P/N 7A001040 TS4 Plus P/N 7A004541


5.1.4 Tool Box

For TS4 Connector

P/N	Wire Stripper		Rivet Plier		TS4 Unlocking Spanner	Picture
	7A001039 Qty.	7A001037	7A001038	7A001036 Qty.	7A001040 Qty.	
7A001035	1pc	None	1pc	None	2pcs	
7A001034	None	1pc	None	1pc		
7A004329	1pc	None	None	1pc		

TS4 Plus For TS4 Plus Connector

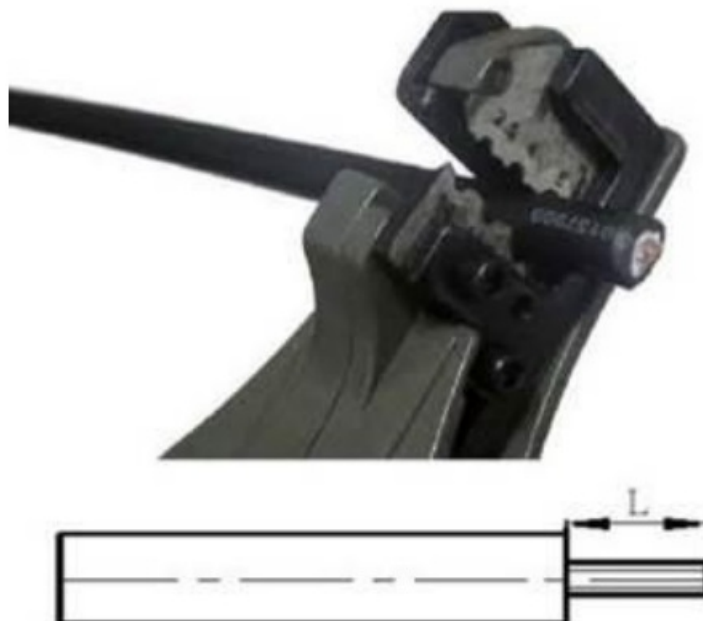
P/N	Wire Stripper	Rivet Plier	TS4 Plus Unlocking	Picture
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					Spanner	
	7A001039 Qty.	7A001037 Qty.	7A001038 Qty.	7A001036 Qty.	7A004541 Qty.	
7A004675	1pc	None	1pc	None	2pcs	

5.2 Assembly Steps

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

5.2.1 Stripping



$L=6\pm0.5\text{mm}$ Strip the plastic insulating layer of cable. $L=6\pm0.5\text{mm}$.

Note: Please pay attention and do NOT cut off and damage the copper wire core under the cable insulating plastic.

5.2.2 Inserting pin and socket



7A001038



7A001036

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. Refer to chapter 5.1.2 for jaw selection.

5.2.3 Crimping pin and socket

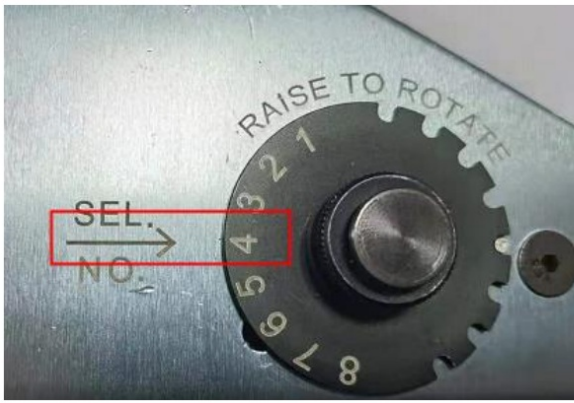


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Insert the stripped cable into the rivet hole of the metal terminal, and make sure all the individual strands are in the hole. Ensure the coaxial of metal parts and cables. Finally, press the riveting tool handles all the way and press it to the end to complete the riveting. All individual strands should be crimped.

For the crimping pliers (7A001036) used for O-type metal terminals, adjust the jaw to the corresponding gear according to different specifications of cables, and adjust the height of the knob so that the outermost edge of the metal terminal is flush with the riveting interface. See Below.

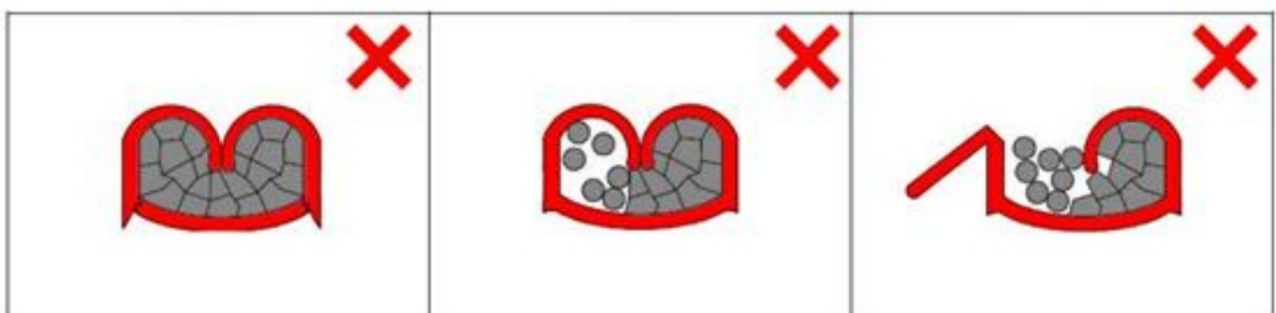
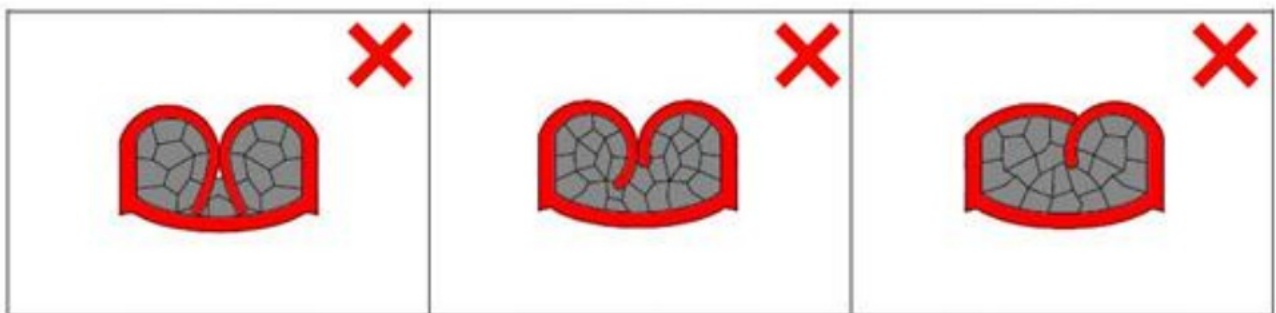
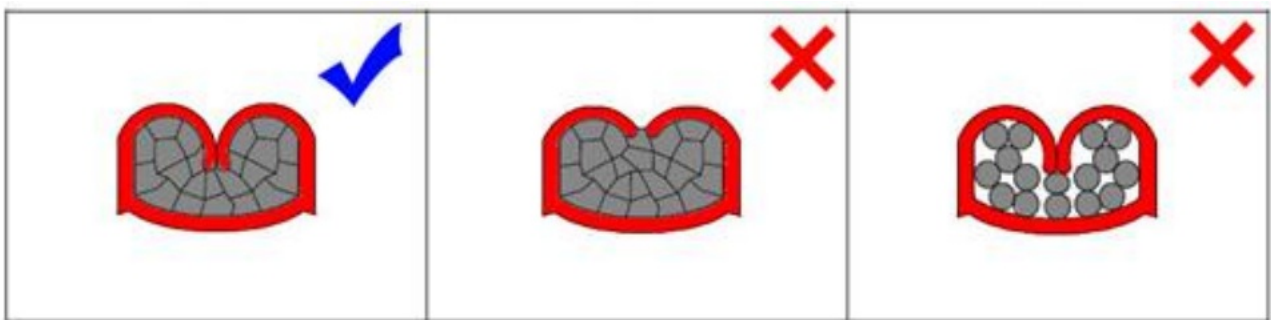




Metal terminal

Gear	Cable spec	Connector type
4	4.0mm2/12AWG	TS4-F5/F7/F8 TS4-M5/M7/M8
6	6.0mm/10AWG	
8	10.0mm2/8AWG	TS4-F6 TS4-M6

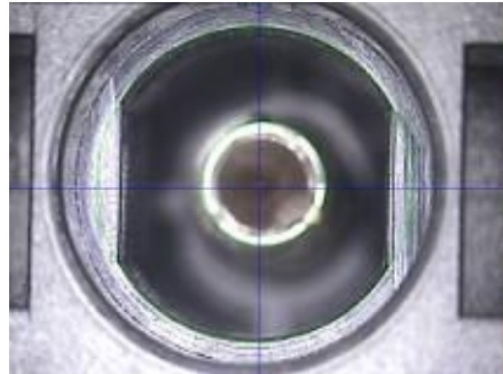
Qualified crimping samples must meet IEC 62852 and the following criteria.



The picture below are riveted pins and sockets.



5.2.4 插入 Pushing



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 that the negative pin is coaxial with the negative body.

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 Install the nut



First, screw the nut by hand, then lock it tightly by a plastic spanner.
For TS4 Connector

Type	Cable OD range	Control gap	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	5 N*m
TS4-F6/M6			
TS4-F7/M7	6.6-7.2mm	0 X≤1.0mm	3±0.5 N*m
TS4-F8/M8	5.6-6.6mm	0 X 1.0mm	
TS4-F9/M9	6.9-7.5mm	0 X≤1.0mm	

For TS4 Plus Connector

Type	Cable OD range	Control gap	Reference torque
TS4 Plus-F1/M1	4.7-6.0mm	0 X 1.0mm	3±0.5 N*m
TS4 Plus-F2/M2	5.6-6.8mm		
TS4 Plus-F3/M4	6.0-7.2mm		

Refer to the following figure for the Control gap.



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

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

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.

Connecting and Disconnecting

6.1 Connecting



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

6.2 Disconnecting



The negative and positive terminals of the connectors must be unlocked with the TS4 plastic spanner (part# 7A001040) or TS4 Plus plastic spanner (part# 7A004541).

Cable

7.1 Connection of Cable

In order to avoid deformation of the cable sealing element from that force generated by bending the wires, the cable should have at least a 20mm straight length nearest to the connector. See the figures below.



Wrong way for the cable



Right way for the cable

Note: Please refer to the detailed instructions on the minimum bend radius specified by the cable manufacturer.

7.2 Connection Status



Trina Solar Service Point


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 Website www.trinasolar.com

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	Richtistrasse 11 8304 Wallisellen- Switzerland	+41 43 299 6800	
	Einsteinring 26 – 85609 Aschheim – Germany	+49 89 1228 49250	
	C/Caleruega, 79, 3º-A, 28033, Madrid , SPAIN	+34 91 133 59 39	
USA & Canada	100 Century Center, Suite 501 San Jose CA 95112	+1 800 696 7114	NAservice@trinasolar.com
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Please visit the Trina Solar site for viewing, downloading, and printing these instructions at <http://www.trinasolar.com>

Documents / Resources

	Trinasolar TS4 Connector and Socket [pdf] Instruction Manual TS4, Connector and Socket, Connector, TS4, Socket
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References

- [T Solar for Home, Utility, and Commercial | Trina Solar US](#)

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