1 Introduction

This specification covers the requirements for application of the PV4-S a b cc Connector as well as guideline for the assembly.

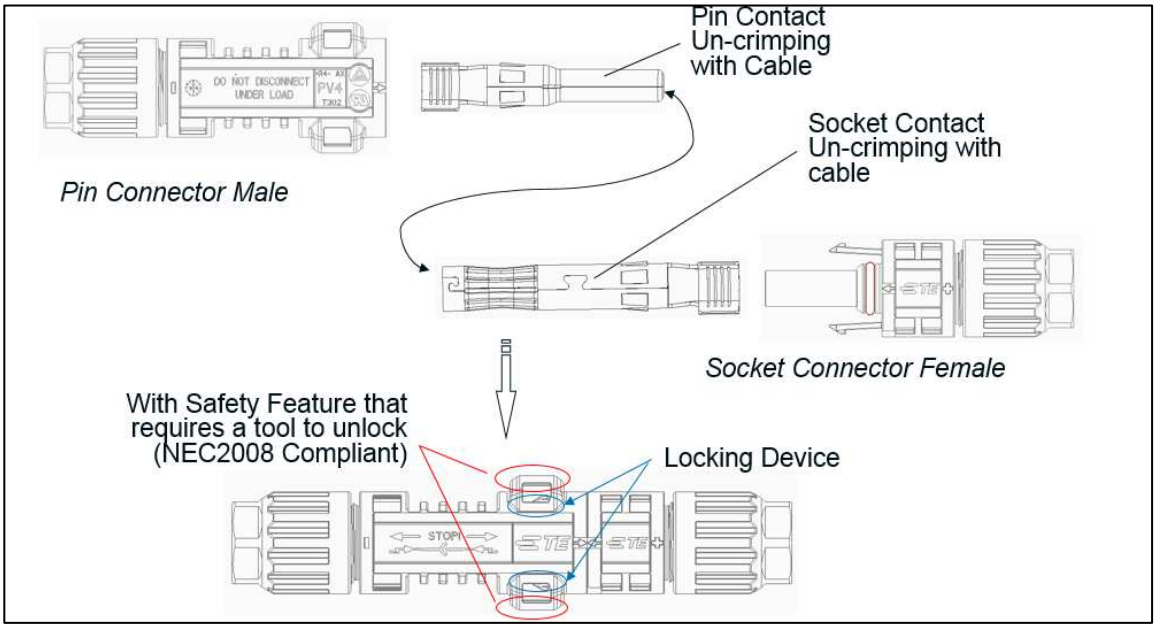

Figure 1

When corresponding with TE connectivity personal, use the terminology in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in **Figure 1.**

Model code description: PV4-S radical followed by **a b cc** codes.

a = 0 for 1000 V / 1 for 1500 V

b = M (male) / F (female)

cc = 25 for 2,5 mm^2 / 40 for 4 mm^2 / or 60 for 6 mm^2

2 Supporting Document

2.1 Drawings

Customer Drawings for product part numbers are available from www.te.com. If there is a conflict between the information contained in the Customer Drawings and this specification or any other technical documentation supplied, contact TE Connectivity.

PV4-SMcc/S1Mcc	(2270024)	Pin Connector (Male)
PV4-SFcc/S1Fcc	(2270025)	Socket Connector (Female)

NOTE

Rating Voltage *PV4-SMcc/SFcc:* *1000 V TÜV Rheinland / 1000 V UL*
PV4-S1Mcc/S1Fcc: *1500 V TÜV Rheinland / 1500 V UL*

Rated current per IEC 62852 A1:2020: PV4-S/S1Mcc / PV4-S/S1Fcc: 29A for 2.5mm² / 35A for 4mm² / 40A for 6mm²

Rated current per UL 6703: PV4-S/S1Mcc / PV4-S/S1Fcc: 35A for 14 AWG / 40A for 12 AWG / 50A for 10 AWG

2.2 Product Specification

Performance specification for the PV4-S a b cc connector can be found in TE Connectivity product specification 108-137077.

2.3 License holder

TE Connectivity Austria GmbH, Schrackstrasse 1, 3830 Waidhofen/Thaya, Austria.

3 Requirements

DANGER:
Do not disconnect underload!

Current path should only be disconnected using approved disconnect devices. Symbol "Do not disconnect under load" is marked on the connector.

NOTE
Mounting and installation must be done by qualified and trained staff considering all applying safety regulations. Failure to follow all instructions in Application Specification(available at www.te.com/documents), including using only approved TE tooling (if applicable), can result in improper installation and/or crimping which is dangerous and may cause or contribute to electrical fires.

CAUTION
Chemical Exposure:

Do NOT allow the connectors contact any chemicals including below but not limited as they may cause stress cracking.

Greases, Oils, personal care products (for example but not limited to: sun blocker, etc.), Lubricants (for example but not limited to: WD40, etc.), Plasticizers Mold release agents, Cleaning agents Organic solvents including aliphatic hydrocarbons, aromatic hydrocarbons, halide hydrocarbons, ketones, alcohols, ethyl acetate, tributyl phosphate, kerosene and gasoline

3.1 General Instructions

Any kind of pollution (dust, humidity, foreign particles etc.) during the assembly process can degrade contact and connectors performance. This applies in particular to the seals and the crimping of the contacts. A clean assembly environment is therefore essential.

CAUTION
Unconnected connectors must always be protected from pollution (e.g.dust humidity, foreign particles, etc), prior to installation. Do NOT leave unconnected (unprotected) connectors exposed to the environment.

3.2 Termination of the cable wires / crimping of the contacts

Connectors use different crimp contacts for various wire gauges. It is necessary to use the proper tool for wire gauge size. Possible connectable wire gauges sizes are 2.5 mm² / 14 AWG, 4.0 mm² / 12 AWG and 6.0 mm² / 10 AWG. The tools to be used are selected based upon the wire gauge.

CAUTION
Shelf life: The contacts should remain in the shipping containers until ready for use to prevent from storage contamination that could adversely affect connection.

3.2.1 Handling of Connectors and Cables

CAUTION

The cable must not be bent or crushed on the direct exit of the cable screw joint A minimum bending radius R ≥ 5 x Cable diameter must be maintained.

The cable must be routed in a way that the tensile stress on the conductor or connections is prevented (see **Figure 2**).
The PV4-S connectors is to be used only to interconnect firmly fixed cables.

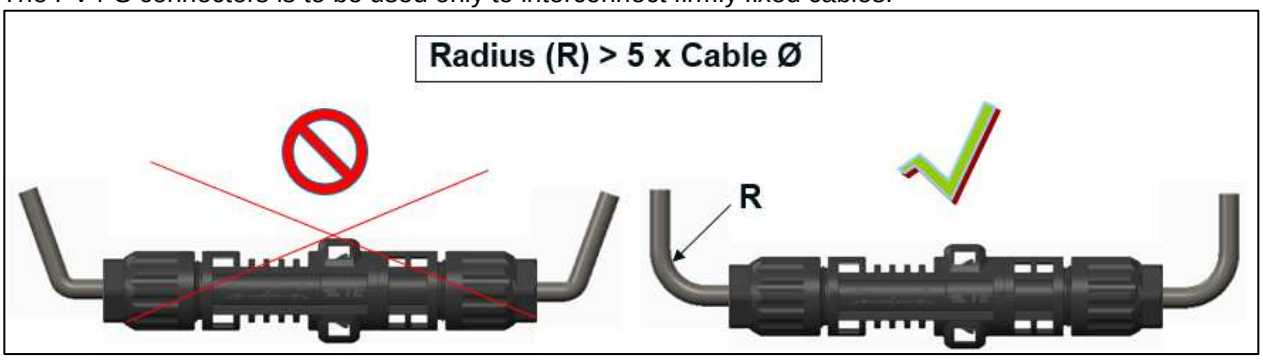

Figure 2

3.2.2 Assembly and Connection of Wire Leads

The crimping contact must be performed in the following procedure:

1) Stripping insulation of the wire lead
Using the appropriate wire stripping tool, strip the wire as indicated in **Figure 3** and **Table 1** without damaging the strands.

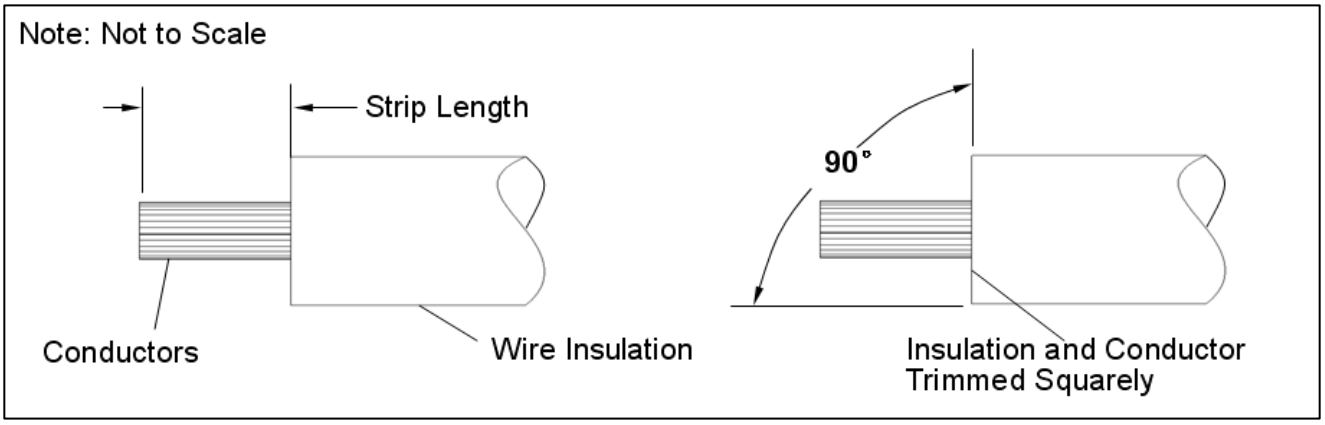

Figure 3

Nominal Wire Size (mm^2 / AWG)	Wire Strip Length (mm)
2.5 / 14, 4.0 / 12 and 6.0 / 10	$6.5^{+1.0}_{-0.5}$

Table 1

2) Crimping Contacts
Making the crimping contacts connection with suitable cross-section tooling and crimped according to the

instructions packaged with the tooling. See section 3.2.3, Crimping Tooling, of this document for detail on tooling options.

NOTE
The applied crimping dimension (within the functional range of the product) is depended on the crimping tooling being used. Refer to the documentation supplied with the crimping tooling for the applied crimping height.

A. Wire barrel Crimp

The crimp applied to the wire barrel of the contacts is the most of compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped contacts. ***The wire barrel crimp height*** must be within the dimension in **Table 2**.

Nominal Wire Size (mm^2 / AWG)	Wire-End Protrusion Length (mm)	Wire Barrel Crimp Width (mm)	Wire Barrel Crimp Height (mm)
2.5 / 14	1.0 ± 1.0	3.01 ± 0.05	1.88 ± 0.05
4.0 / 12	1.0 ± 1.0	3.94 ± 0.05	2.14 ± 0.05
6.0 / 10	1.0 ± 1.0	3.94 ± 0.05	2.49 ± 0.05

Table 2

Note: The crimp width is tooling dependent. Checking the crimp width is checking for the proper tool and not a process control.

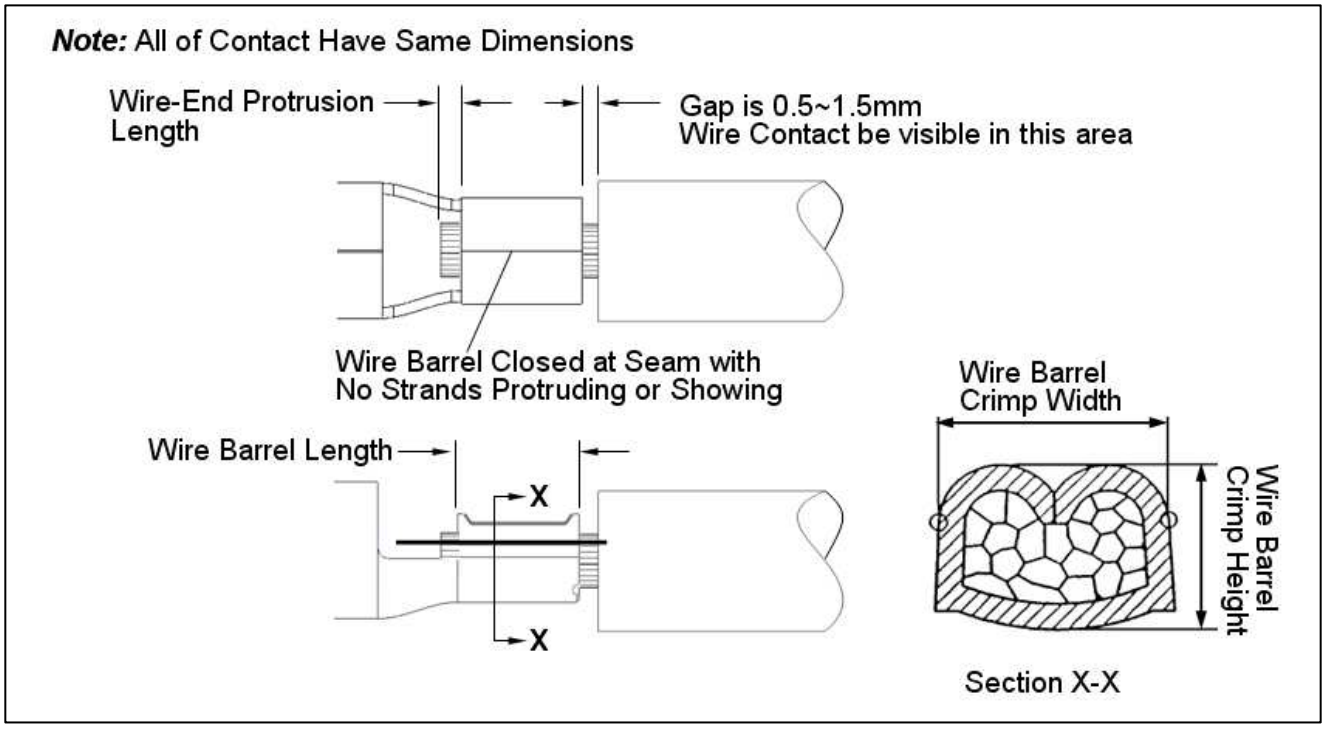

Figure 4

B. Effective Crimp Length

For optimum crimp effectiveness, the crimp must be within the area shown in **Figure 4** and must meet the crimp dimensions provided in **Table 2**.

C. Wire-End Protrusion Length

The wire barrel shall not exceed the dimension shown in **Figure 4 and Table 2.**

D. Wire Location

The wire conductor must be visible in the transition area between the wire barrel and insulation as shown in **Figure 4**.

E. Wire Barrel Seam

The wire barrel seam must be closed with no evidence of loose wire strands visible in the seam. See **Figure 4**.

3.2.3 Crimping Tooling

Because of the large amount of product variations and application tooling available, it is not feasible to list all the tooling on this document. The operation instructions packaged with that tooling. The following tools are available for the contact crimping.

3.2.3.1 Hand Crimping Tool

Hand crimping tools are designed for low-volume application and repair.

No.	TE connectivity Part Number	Wire size	Approval	Order Text	Picture
1	4-1579002-2	2.5 +4.0 +6.0 mm^2	N/A	SOLARLOK insulation stripper	
2	7-1579016-5	2.5 +4.0 mm^2	N/A	Hand-crimp tool (complete) for crimping contact	
3	6-1579014-8	4.0 +6.0 mm^2	N/A	Hand-crimp tool (complete) for crimping contact	
4	4-1579016-7	4.0 +6.0 mm^2	N/A	Crimp head for crimping contact	

Table 3

3.2.3.2 Applicators

Applicators are designed for the full wire size range of terminals and provide for high volume or mass production requirements. The applicators can be used in bench or floor model power units.

NOTE
Each applicator is shipped with a metal identification tag attached. Do not remove this tag or disregard the information on it. Also, a packet of associated paperwork is included in each applicator shipment. This information should be read before using the applicator; then it should be store in a clean, dry area near the applicators for future reference. Some changes may have to be made to the applicators to run in all related power units. Contact TE connectivity corporate engineering.

3.3 Assembly of Connectors

The assembly of the connectors must be performed in the following sequence:

CAUTION
Point 1)-2) do not apply for prefabricated connector in this case the contact crimped wire lead of cable has to be inserted directly into the correct preassembled connector housing.

1) The engagement of the Sealing & Pinch Ring into the connector housing until it stops (see Figure 5 and 6)

Figure 5
Connector Housing Components

Figure 6
Preassembled Sealing & Pinch ring

2) Connect the cable screw joint nut on to the connector housing (only 2-3 turns).

Figure 7
Preassembled Connector Housing

3) Insert the contact crimped wire lead of cable until an audible click sound is heard and then give a slight pull back (a maximum of 5 to 10 N) to check whether the contact is locked.

The contact engagement force is 25N maximum.

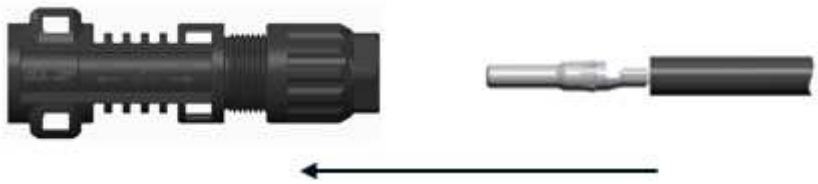

Figure 8
assembly: Insertion of contact with crimped wire lead of cable

NOTE
The Pin Contact shown, and the Socket Contact have same assembly process

4) Use a slotted torque wrench head (2232097-1) to tighten the cable screw joint nut (see Figure 9)

Figure 9

Tightening of the cable screw joint nut
(Torque force: 2.0 ±0.1 Nm for cable ø6.0 mm to ø7.0 mm, 2.4 ±0.1 Nm for cable ø > 7.0 mm. The torque force value is for our TE internal Typical cable assembly. To make sure to achieve the perfect performance, please consult TE before connector assembly with your own cable, as different cable have different rigidity.

CAUTION
In case of replacement of components or assembling / disassembling of the cable entry gland, new pinch rings and seals must be used. If a visible deformation appears at the clamping area of the cable, the cable end needs to be trimmed to remove the deformed area, also use new housing preassembly.

3.4 Connectors Mating

When mating the connectors, ensure the following:

- It is only allowed to connect a positive (**+**) coded connector to a negative (**-**) coded connector. Connectors with identical polarity mark are **not** allowed to couple (forbidden to use **+** on **+** or **-** on **-**)
- Mating of the connectors is done by pushing the connectors together until a clear audible click is heard. This clear audible clicking sound must be heard to ensure the connectors have been mated correctly. When the connectors are correctly connected the latches should be flush against the edge of the connector (see **Figure 10**).

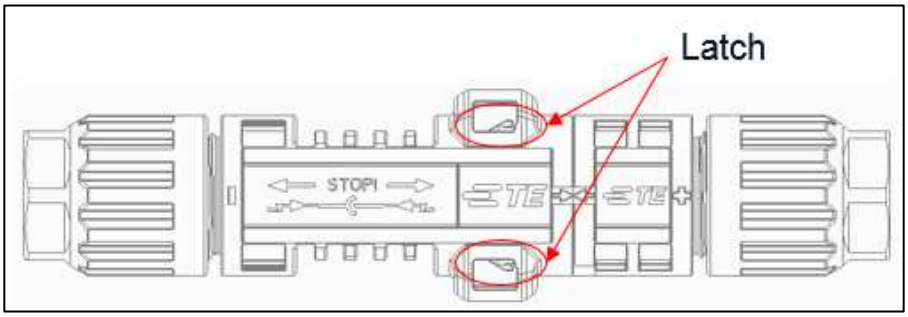

Figure 10

The polarity symbols positive (**+**) and negative (**-**) + are marked on the Connector (See Figure 11)

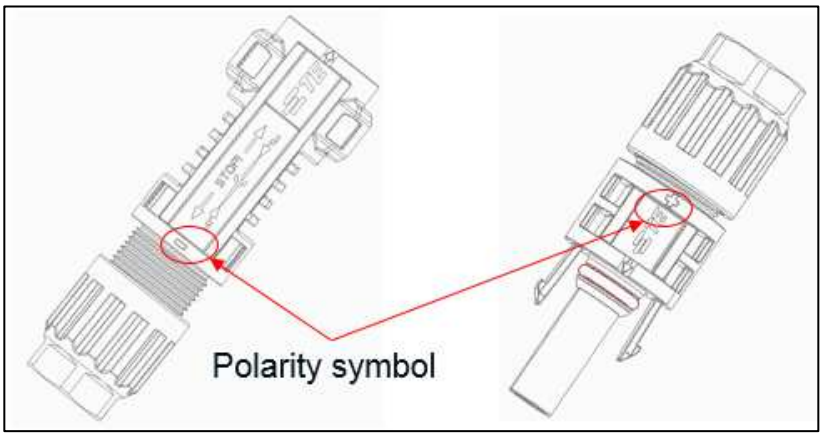

Figure 11

CAUTION

Once connectors are mated together, the maximum allowed rated current value of the assembly must be aligned with the lowest of each single connector part (male or female) associated with his respective cable cross section.

3.5 Disconnecting

Danger

Do not disconnect underload!

Current path should only be disconnected using approved disconnect devices.

The following hand application tool **(1971903-1)** is available for assembling and disconnecting the connector in **Figure 12** and tightening the cable screw joint nut for low-volume application and repair.

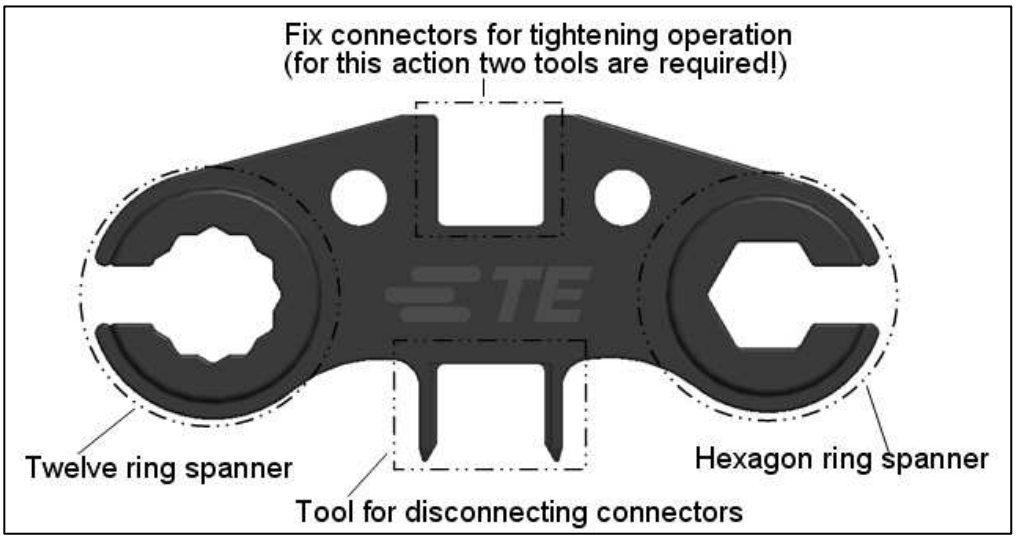

Figure 12

Hand Application Tool:

1. The locking mechanism is opened by depressing the latches with hand application tool **(1971903-1)** as shown in **Figure 13**.

2. Disconnect the connectors connection while the special tool insertion into the locking mechanism to depress the latches and pull the connectors apart.

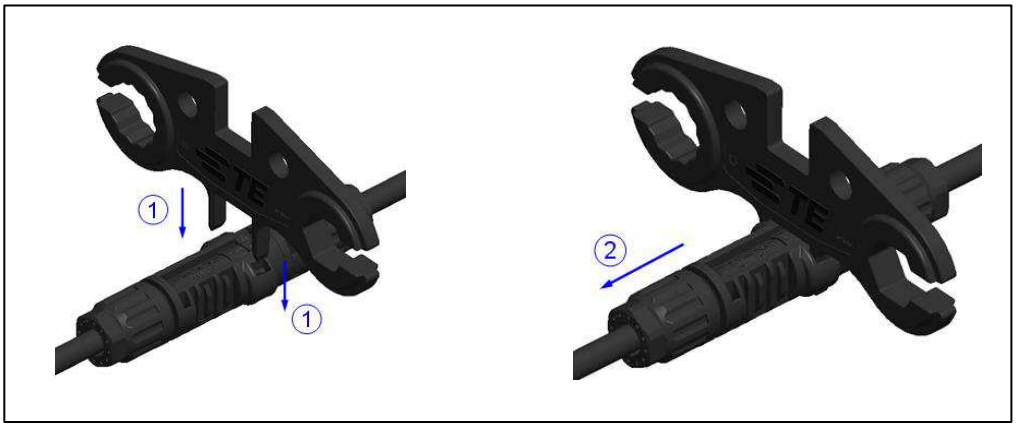

Figure 13
Disconnect the connectors

NOTE
The above disconnecting picture just show how to disconnect the connector.

3. For installation application, the opening tool can be used for tightening operation in **Figure 14**

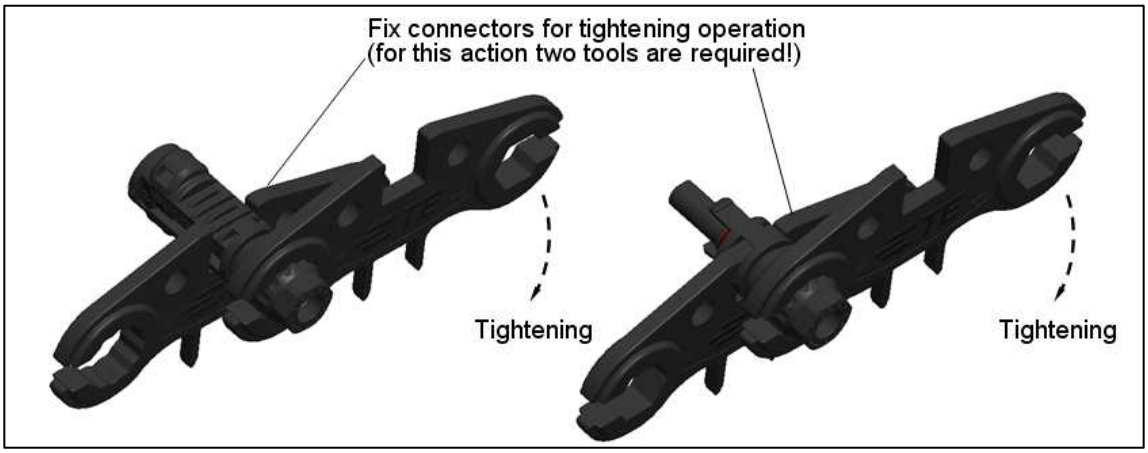

Figure 14
Tightening the connectors with Opening tool

3.6 Protective Cover for connectors

These protective dust caps serve for the protection against environmental contaminants.

Figure 15

4 Applications Examples

PV-H module Serial connection example

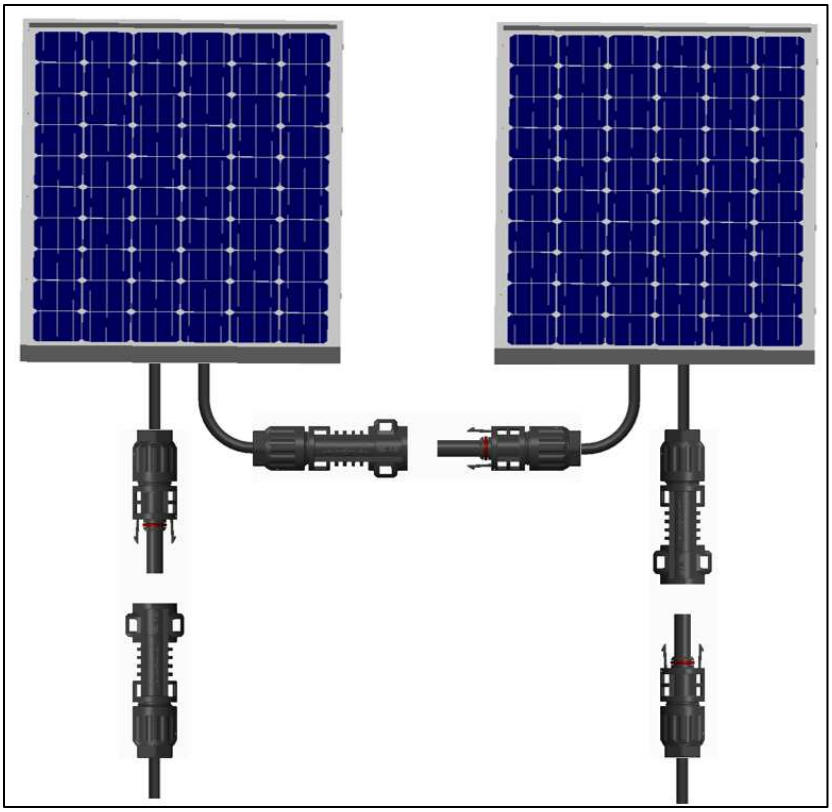

Figure 16

5 Storage

See Product specification 108-137077.

6 Tools

1. The following tools are available for crimping the contacts including hand crimping tool (6-1579014-8) and crimp head (4-1579016-7)
2. Insulation stripper (4-1579002-2) is recommended for stripping the wire
3. Hand application tool (1971903-1) is available for assembling and disconnecting the connectors
4. A slotted torque wrench head (2232097-1) is recommended for tightening the cable screw joint nut

NOTE
Assembly Part No. selection criterion

Cable Outside Diameter	**Cable Screw Joint Material**	**Assembly Part Number (packaged by 1000 pcs)**		**terminals**
		For Male Connector	For Female Connector	
TÜV Rheinland (see below approved cables) UL: From 5.9 up to 7.5mm	PPE PA	2270024-3 4-2270024-3	2270025-3 4-2270025-3	2.5mm²
	PPE PA	2270024-1 3-2270024-3	2270025-1 3-2270025-3	4 & 6mm²

Table 4

PV4-S connector is certified for generic cable usage according §5.14.2; IEC 62 852 + A1

5.9 - 6.4mm for 1x2.5mm² cable (IEC 62930; EN 50618 certified cable)

6.2 - 6.45 mm for 1x4mm² cable (IEC 62930; EN 50618 certified cable)

6.77 – 7.30mm for 1x6mm² cable (IEC 62930; EN 50618 certified cable)

All cables must be tinned copper conductor class 5 according to IEC 60228:2005 covered by sheathing material complying with material group I according to IEC60664-1:2020

Annex A : Documentation Change Record

LTR	Clause	Page	Change Description	DATE	DWN	APRD
A	-	-	New release	04 Nov 2014	LW	PY
A1	Item 2.1 and 2.2	2	Change the voltage from 1000V to 1500V	04 May 2015	LW	DT
A2		12	Added New Information Table No.4	14 Jan 2016	KR	ZY
A3	2.1 and 2.2	2	Update rate voltage and model code	01 Jun 2016	LW	ZY
A4	3	3	Added chemical exposure	14 Nov 2016	ZY	SM
A5	3	7 and 12	Obsoleted OD5.5mm~6.0mm pinch ring type	20 Sep 2017	SG	SM
A6	6 and all	12 and all	Updated cable outside diameters and re-formatted document	10 Oct 2018	MZ	MZ
A7	6	12	Added information on Agencies	11 Oct 2018	MZ	MZ
A8	Multi	Multi	Replaced EN cable for IEC 62930. Added license holder.	06 April 2020	CvS	MZ
A9	3.3.1 and 6	6 and 12	TE connectivity cable approved by TÜV Rheinland added	15 April 2020	CvS	MZ
A10	3	2	Chemical substances added	04 Nov 2020	CvS	MZ
A11	2.1	1	New model code New TÜV Rheinland certificate numbers for TE connectivity cables New TE connectivity template	5 Sept 2022	AG	FD
B	2.3 6	2 11 and 12	Licence holder legal entity name from “Tyco Electronics Austria” to “TE Connectivity Austria” Table 4. Part number using PA nut added. TÜV Rheinland section, min and max cable OD as per mandrel test	26 May 2025	AG	FD