RoHS Ready

# SOLARLOK
# Photovoltaic Interconnection System

Tyco Electronics

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Our website is more than an Internet guide. It is constantly being added to and is an innovative and interactive source for applications tips, product updates and technical information of all types. With our innovative StepSearch software, which has been perfected over a period of several years you can conveniently surf your way through all our products.

The SOLARLOK Concept

## System Features

### Junction Box

- Variable wiring options
- Easily accessible
- Simple, fast and cost-effective assembly
- Flat, low profile design
- High current carrying capacity
- Good thermal balance
- Connectorized or direct wire configurations
- Up to four outputs possible
- Up to six internal rails
- Customer-specific solutions
- TÜV and UL approved

### Connector

- Simple on-site processing
- Mating safety provided by keyed housings
- Semi-automatic assembly capability possible
- Multiple plugging and unplugging cycles
- Accomodates solar cable with different insulation diameters
- High current carrying capacity
- Wide temperature operating range
- TÜV and UL approved

### Solar Cable

- Dual wall insulation
- Electron beam cross-linked
- Excellent resistance to U.V., water, ozone, fluids, salt, general weathering
- Excellent resistance to abrasion
- Halogen free, flame retardant, low toxicity
- Very low smoke emissions
- Excellent flexibility and stripping performance
- Different cable diameters
- Operating Temperature from –40 °C up to +125 °C
- Voltage Rating up to 1800 V DC
- Short circuit resistant up to +250 °C
- TÜV and UL approved

## Simple and Reliable System Interconnection of Individual Solar Modules Right to the DC/AC Converters

Market expansion of the formerly regulated energy supply sector, increased global environmental awareness and governments committing themselves to more stringent environmental targets have opened up new opportunities for the photovoltaic industry.

Having served a niche market in the past, the photovoltaics industry now has the opportunity to move into mass production, realizing economies of scale and gaining a greater market share of the world's energy mix.

Tyco Electronics will be contributing to the establishment of this environmentally-friendly technology with the introduction of its SOLARLOK connector system.

SOLARLOK delivers a flexible system solution for easy and reliable interconnections from photovoltaic modules to the DC/AC converter. The entire system concept is based on cost-effective and reliable processing of individual interconnection system components. This significantly reduces installation costs of the solar energy system.

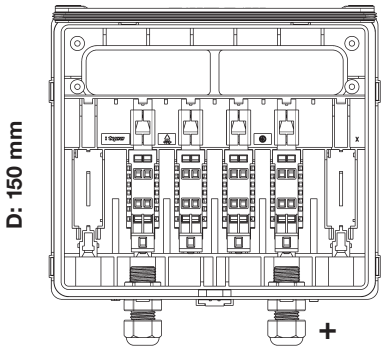
The junction box concept is based on a flexible, open system structure, which allows serial as well as parallel interconnection via direct wire connect or separable connectors. Within the junction box, up to six termination places rails are available for photovoltaic foil connection.

The male and female cable coupler was designed for high voltage and high current-carrying capacity in addition to the well-established IP 67 sealing requirement in the photovoltaic industry. Mating safety is provided by polarity keyed housings, fully shrouded contacts, reliable high cycle life, and squeeze to release connection system. In addition, a wide temperature range and fulfillment of worldwide standards for photovoltaic connection systems complement the robust product specification.

The design of the male and female receptacle for the junction box and the DC/AC converter follow the cable coupler "click philosophy" for quick and secure mating even in difficult mounting positions.

If required by the customer, the junction box can be delivered pre-configured with diodes, jumpers, plug connectors, and solar cable pigtails.

## Large Junction Box – Serial Interconnection




All mentioned versions are standard. Plus-connection see drawing.

### Junction Box with Mounted Cable and Connectors

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) |
|---|---|---|---|---|---|
| 1740300-2 | 6 | 5 | 6.0 | 1,000 | 4.0 |
| 1987294-2 | 6 | 5 | 8.5 | 1,000 | 4.0 |
| 1987254-2 | 6 | 5 | 13.0 | 1,000 | 4.0 |
| 1740077-1 | 4 | 3 | 6.0 | 1,000 | 4.0 |
| 1740077-3 | 4 | 3 | 8.5 | 1,000 | 4.0 |
| on request | 4 | 3 | 13.0 | 1,000 | 4.0 |

### Junction Box with Connector Outlet

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) |
|---|---|---|---|
| 3-1394723-0 | 6 | 5 | 6.0 |
| 6-1394723-5 | 6 | 5 | 8.5 |
| 6-1394723-6 | 6 | 5 | 13.0 |
| 2-1394723-4 | 4 | 3 | 6.0 |
| on request | 4 | 3 | 8.5 |
| 5-1394723-3 | 4 | 3 | 13.0 |

**Junction Box with Extended Wiring Space**

### Special Versions

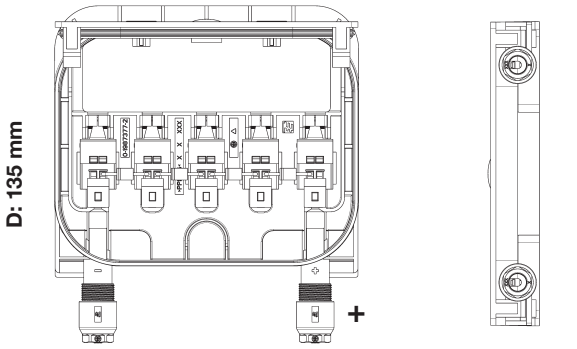
| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) | Comments |
|---|---|---|---|---|---|---|
| 1981988-1 | 6 | 5 | 8.5 | 1,000 | 4.0 | Junction Box with extended wiring space |
| 1981987-1 | 6 | 5 | 13.0 | 1,000 | 4.0 | |

Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## 5-Rail Junction Box – Serial Interconnection




All mentioned versions are standard. Plus-connection see drawing.
TÜV and UL pending.

### Junction Box with Mounted Cable and Connectors

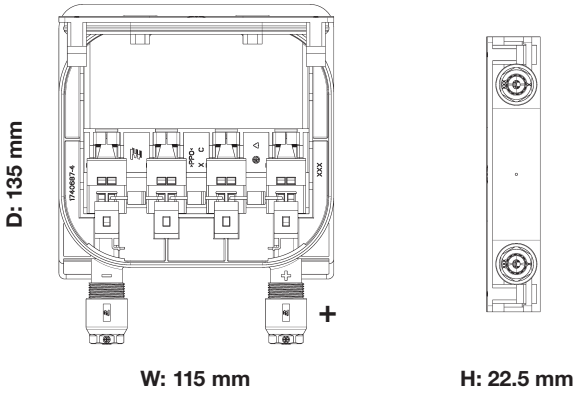
| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) |
|---|---|---|---|---|---|
| 1987858-3 | 5 | 4 | 8.5 | 1,000 | 4.0 |
| 1987982-3 | 5 | 4 | 13.0 | 1,000 | 4.0 |

### Junction Box with Connector Outlet

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) |
|---|---|---|---|
| on request | 5 | 4 | 8.5 |
| on request | 5 | 4 | 13.0 |

Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).

## Medium Junction Box – Serial Interconnection




All mentioned versions are standard. Plus-connection see drawing.

### Junction Box with Mounted Cable and Connectors

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) |
|---|---|---|---|---|---|
| 1987002-4 | 4 | 3 | 6.0 | 1,000 | 4.0 |
| 1740699-6 | 4 | 3 | 8.5 | 1,000 | 4.0 |
| 1740971-2 | 4 | 3 | 13.0 | 1,000 | 4.0 |

### Junction Box with Connector Outlet

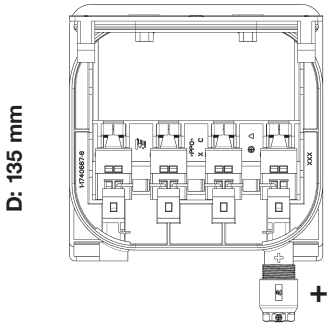
| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) |
|---|---|---|---|
| 1987003-3 | 4 | 3 | 6.0 |
| 1740700-1 | 4 | 3 | 8.5 |
| 1740972-1 | 4 | 3 | 13.0 |

Standard mounting on the panel with silicone glue (approved types see application specification). Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

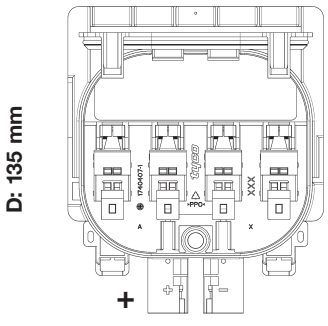
## Medium Junction Box – Serial Interconnection – Special Versions

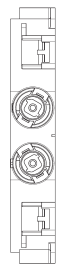


All mentioned versions are standard. Plus-connection see drawing.

### Junction Box with Mounted Cable and Connectors

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) | Comments |
|---|---|---|---|---|---|---|
| 3-1740699-9 | 4 | 3 | 8.5 | 1,000 | 4.0 | Male Contact (neutral) right, left closed |
| 3-1740699-8 | 4 | 3 | 8.5 | 1,000 | 4.0 | Female Contact (neutral) left, right closed |
| 1987994-1 | 4 | 3 | 13.0 | 1,000 | 4.0 | Male Contact (neutral) right, left closed |
| 1987995-1 | 4 | 3 | 13.0 | 1,000 | 4.0 | Female Contact (neutral) left, right closed |



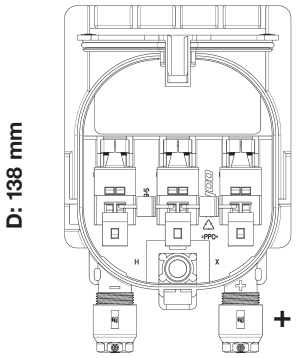




### Inside Style

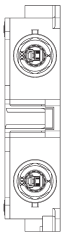
| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) | Comments |
|---|---|---|---|---|---|---|
| 1740657-8 | 4 | 3 | 8.5 | 1,000 | 4.0 | with Mounted Cable |
| 1740658-1 | 4 | 3 | 8.5 | 1,000 | 4.0 | with Connector Outlet |

Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).

## Small Junction Box – Serial Interconnection




W: 90 mm



H: 22 mm

All mentioned versions are standard. Plus-connection see drawing.

### Junction Box with Mounted Cable and Connectors

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) |
|---|---|---|---|---|---|
| 1740425-5 | 3 | 2 | 6.5 | 1,000 | 4.0 |
| 1987225-6 | 3 | 2 | 10.5 | 1,000 | 4.0 |
| 1987252-1 | 3 | 2 | 14.0 | 1,000 | 4.0 |

### Junction Box with Connector Outlet

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) |
|---|---|---|---|
| 1418867-6 | 3 | 2 | 6.5 |
| 1987459-1 | 3 | 2 | 10.5 |
| 1987777-1 | 3 | 2 | 14.0 |

Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).



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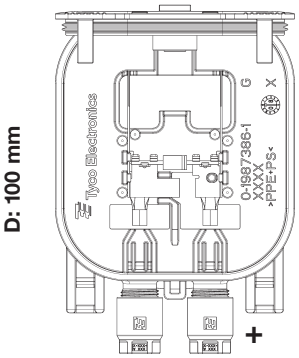
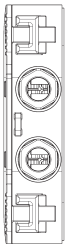
Consult Tyco Electronics for latest specifications.

## Eco Junction Box – Serial Interconnection




W: 76 mm



H: 18.5 mm

All mentioned versions are standard. Plus-connection see drawing.
TÜV and UL pending.

### Junction Box with Mounted Cable and Standard Connectors

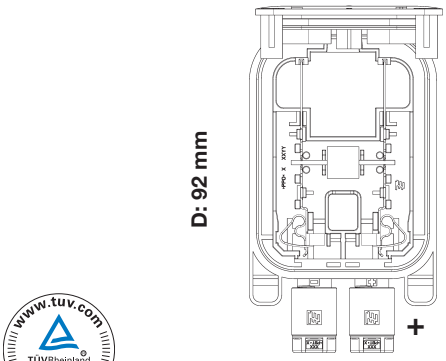
| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) | Foil Connection |
|---|---|---|---|---|---|---|
| 1987392-1 | 2 | 1 | 8 | 1,000 | 4.0 | Straight |
| 1987392-2 | 2 | 1 | 8 | 1,000 | 4.0 | Angled |

### Junction Box with Mounted Cable, Slim Line Connectors and Double-Sided Adhesive Tape

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) | Foil Connection |
|---|---|---|---|---|---|---|
| 1987392-3 | 2 | 1 | 8 | 1,000 | 2.5 | Straight |

Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).

Slim Junction Box – Serial Interconnection



All mentioned versions are standard. Plus-connection see drawing.
UL pending.

## Junction Box with Mounted Cable and Standard Connectors

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) |
|---|---|---|---|---|---|
| 1971158-2 | 2 | 1 | 3 | 600 | 2.5 |

## Junction Box with Mounted Cable and Slim Line Connectors

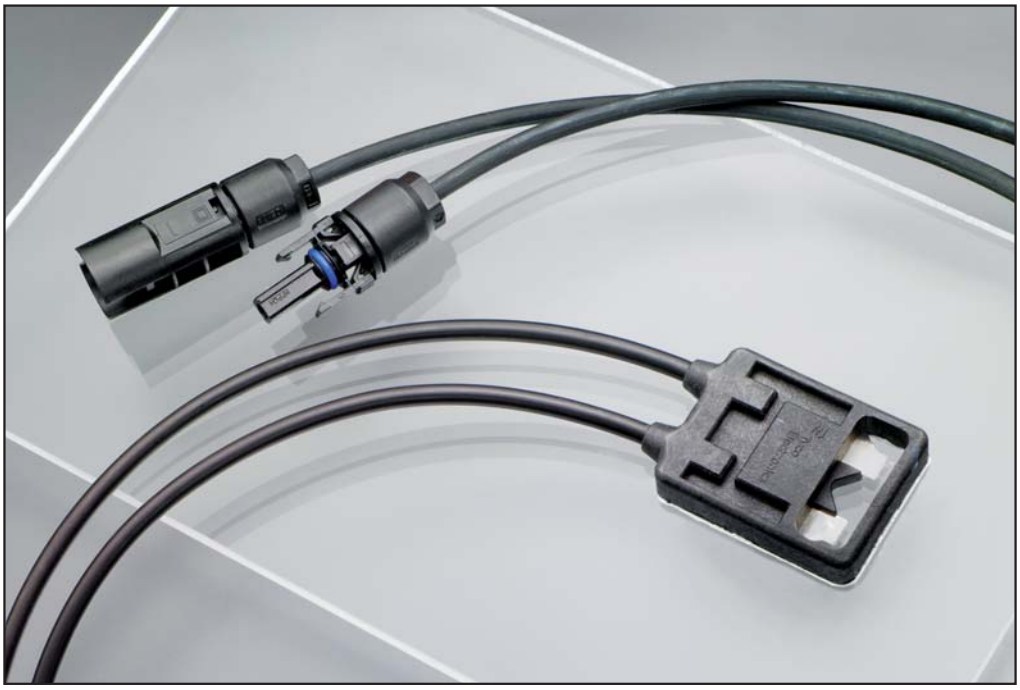
| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size ($mm^2$) |
|---|---|---|---|---|---|
| on request | 2 | 1 | 3 | 600 | 2.5 |

Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).



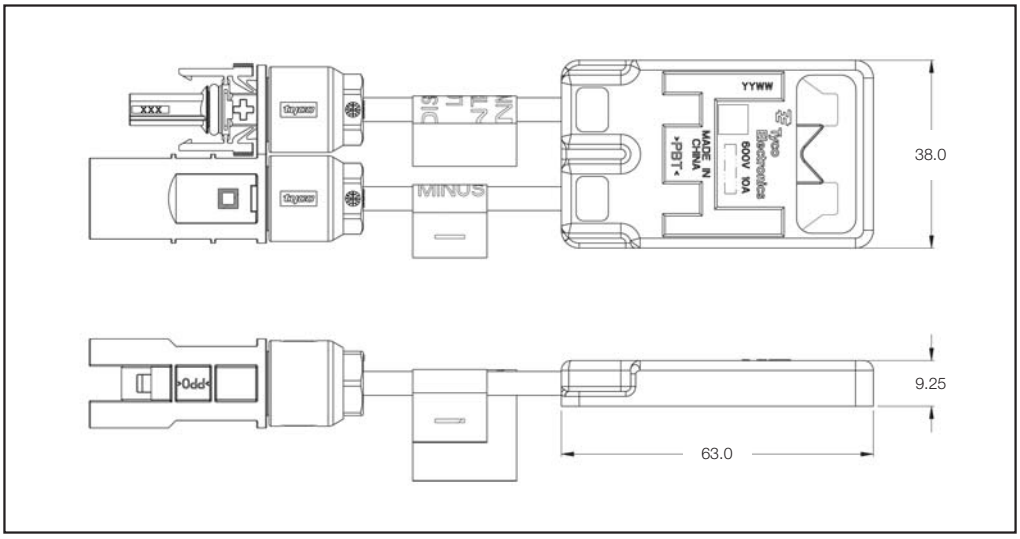
All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## Micro Junction Box – Serial Interconnection



All mentioned versions
are standard.
Plus-connection see drawing.

TÜV pending.




### Micro Junction Box with Overmolded Cable

| Part Number | Contact Rails | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Cable Length (mm) | Wire Size (AWG) |
|---|---|---|---|---|---|
| 1954875-3 | 2 | 1 | 10 | 750 | 12 |

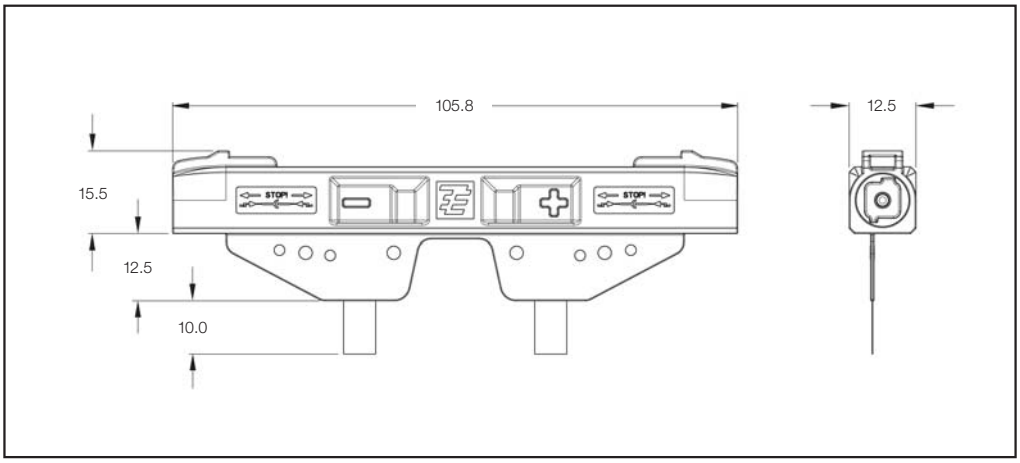
Standard mounting on the panel with silicone glue (approved types see application specification).
Optional with double-sided adhesive tape (specifications of the adhesive tape can be found in the datasheets of the manufacturer).

Junction Boxes for Building integrated PV Applications (BiPV)

**Attention:**

**It is not permitted to use this product and products including it in the USA.**

**TÜV pending.**




## Wing-Edge Junction Box

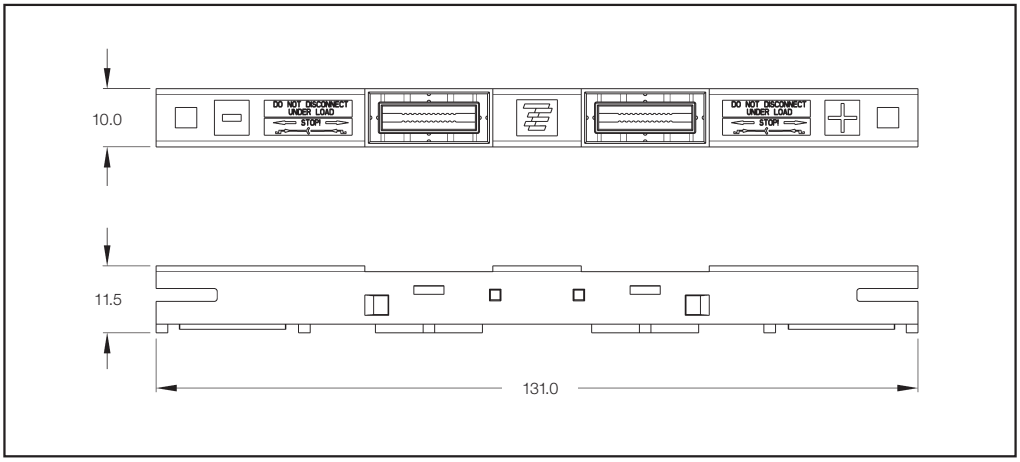
| Part Number | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Connection Type |
|---|---|---|---|
| 1987293-3 | 1 | 10 | with Slim Line Connector System (see Page 15) |



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## Junction Boxes for Building integrated PV Applications (BiPV) (continued)

Connection of foil by soldering. Required potting material please see application specification.




### Straddle Edge Junction Box

| Part Number | Diodes | Rated Current (IEC 61215, Edition 2) (Ampere) | Connection Type |
|---|---|---|---|
| 1971569-1 | 1 | 11 | Specific Connector System (see table below) |

### Accessories

| Part Number | Description |
|---|---|
| 1971131-1 | Female Cable Coupler, Plus Contact |
| 1971131-2 | Female Cable Coupler, Minus Contact |
| 1971133-1 | Termination Connector |

These specific Slim Connectors can be equipped with contacts of the SOLARLOK system on page 28.

## Solar Labels

### Product Features

- UV resistant
- Meet IEC61215 Edition 2.0, IEC61646 Edition 2.0
- UL- certified
- Withstand harsh outdoor environments
- Labels can be customized to customer requirements (design, logos, colors, specifications, etc.)

| Product Description | Part Number | Label Description | Quantity on Roll |
|---|---|---|---|
| SOL-SD-104076-4-0.1 | CN4616-000 | Solar Disconnect | 100 |
| SOL-DCD-104100-4-0.1 | CN4619-000 | DC Disconnect | 100 |
| SOL-DPS-104019-4-0.1 | CN4618-000 | Warning – Dual Power Sources | 100 |
| SOL-ESH-104019-4-0.1 | CN4617-000 | Warning – Electric Shock Hazard | 100 |
| SOL-SD-104076-4-0.5 | CL3803-000 | Solar Disconnect | 500 |
| SOL-DCD-104100-4-0.5 | CL3806-000 | DC Disconnect | 500 |
| SOL-DPS-104019-4-0.5 | CL3804-000 | Warning – Dual Power Sources | 500 |
| SOL-ESH-104019-4-0.5 | CL3805-000 | Warning – Electric Shock Hazard | 500 |



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## Combiner Box

### Product Features

- Combines up to 5 PV strings
- Converts to standard wires
- Completely pre-assembled
- Plug and play design provides labor savings and minimizes installer error during installation
- Uses existing products currently produced by Tyco Electronics
- UL 1741 pending
- No approval for use outside Americas!
- Part No. 1954283-1

SOLARLOK Combiner Box Assembly is used to combine up to five strings in a pre-terminated connectorized weather-resistant enclosure to meet National Electric Code (NEC) requirements for series fusing of photovoltaic (PV) modules (solar panels).

The combiner box assembly consists of a box, cover (with hinges), transparent dead front lid (under the cover), and 10 pre-terminated SOLARLOK connectors each with a removeable seal cover. The box features 4 knockouts (for output wiring), lock tab, mounting slots, and pre-wired grounding clip.

The interior of the box holds 5 fuse blocks pre-wired to the positive SOLARLOK connectors, 5 terminal blocks pre-wired to the negative SOLARLOK connectors, and an equipment terminal block used to ground the equipment. Fuses are not included.

Part No. **1954283-1**

Cable Coupler – Standard Line

## Female Cable Coupler (Kit with Screw-Machined Contact)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1394462-1 | 2.5 | Plus | 100 |
| 1394462-3 | 4.0 | Plus | 100 |
| 5-1394462-5 | 6.0 | Plus | 100 |
| 1394462-2 | 2.5 | Minus | 100 |
| 1394462-4 | 4.0 | Minus | 100 |
| 5-1394462-6 | 6.0 | Minus | 100 |

## Male Cable Coupler (Kit with Screw-Machined Contact)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1394461-1 | 2.5 | Plus | 100 |
| 1394461-3 | 4.0 | Plus | 100 |
| 6-1394461-5 | 6.0 | Plus | 100 |
| 1394461-2 | 2.5 | Minus | 100 |
| 1394461-4 | 4.0 | Minus | 100 |
| 6-1394461-6 | 6.0 | Minus | 100 |
| 6-1394461-1 | 2.5 | Neutral | 100 |
| 6-1394461-2 | 4.0 | Neutral | 100 |
| 6-1394461-4 | 6.0 | Neutral | 100 |

## Female Cable Coupler (without Contact – only Housing and Sealing)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1740940-3 | – | Plus | 2,500 |
| 1740940-4 | – | Minus | 2,500 |

## Male Cable Coupler (without Contact – only Housing and Sealing)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1740939-5 | – | Plus | 2,500 |
| 1740939-4 | – | Minus | 2,500 |
| 1740939-2 | – | Neutral | 2,500 |



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

Cable Coupler – Slim Line

## Female Cable Coupler (Kit with Screw-Machined Contact)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1987559-1 | 2.5 | Plus | 100 |
| 1-1987559-1 | 4.0 | Plus | 100 |
| 1987559-2 | 2.5 | Minus | 100 |
| 1-1987559-2 | 4.0 | Minus | 100 |

## Male Cable Coupler (Kit with Screw-Machined Contact)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1987558-1 | 2.5 | Plus | 100 |
| 1-1987558-1 | 4.0 | Plus | 100 |
| 1987558-2 | 2.5 | Minus | 100 |
| 1-1987558-2 | 4.0 | Minus | 100 |
| 1987558-3 | 2.5 | Neutral | 100 |
| 1-1987558-3 | 4.0 | Neutral | 100 |

## Female Cable Coupler (without Contact – only Housing and Sealing)

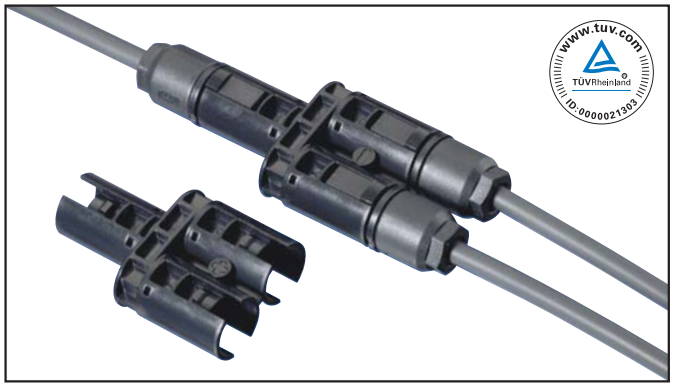
| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1987287-1 | – | Plus | 2,500 |
| 1987287-2 | – | Minus | 2,500 |

## Male Cable Coupler (without Contact – only Housing and Sealing)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1987286-4 | – | Plus | 2,500 |
| 1987286-5 | – | Minus | 2,500 |
| 1987286-6 | – | Neutral | 2,500 |

TÜV and UL pending.

T-Branch Connector



## Parallel Interconnection using T-Branch Connector (Male-to-Male)

| Part Number | Keying | Package Quantity |
|---|---|---|
| 1534611-1 | Plus | 20 |
| 1534611-2 | Minus | 20 |

## Parallel Interconnection using T-Branch Connector (Female-to-Male)

| Part Number | Keying | Package Quantity |
|---|---|---|
| 1740277-1 | Plus | 20 |
| 1740277-2 | Minus | 20 |

Standard

NEC/UL certified

## Safety + Clip (Optional Connector Latch Locking Clip Standard)

| Part Number | Keying | Package Quantity |
|---|---|---|
| 1534226-1 | Standard | 100 |
| 2106207-1 | NEC/UL certified | 100 |

## Connector Dust Covers

| Part Number | Remarks | Package Quantity |
|---|---|---|
| 1987423-1 | for Female Cable Coupler | 100 |
| 1394739-1 | for Male Cable Coupler | 100 |

All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## DC Converter Receptacle

### With O-Ring and Metal Nut (Kit with Screw-Machined Contact)

| Part Number | Wire Size ($mm^2$) | Keying | Package Quantity |
|---|---|---|---|
| 1394738-1 | 2.5 | Plus | 100 |
| 1394738-3 | 4.0 | Plus | 100 |
| 1394738-9 | 6.0 | Plus | 100 |
| 1394738-2 | 2.5 | Minus | 100 |
| 1394738-4 | 4.0 | Minus | 100 |
| 1-1394738-0 | 6.0 | Minus | 100 |

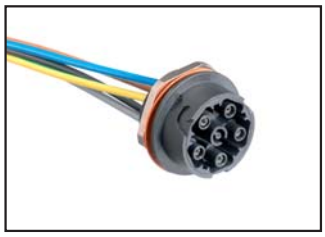
### With Flat Seal and Plastic Nut (Kit with Screw-Machined Contact)

| Part Number | Wire Size ($mm^2$) | Keying | Flat Seal Color | Package Quantity |
|---|---|---|---|---|
| 1740210-1 | 2.5 | Plus | Black | 100 |
| 1740210-3 | 4.0 | Plus | Black | 100 |
| 1740210-5 | 6.0 | Plus | Black | 100 |
| 1740210-2 | 2.5 | Minus | Black | 100 |
| 1740210-4 | 4.0 | Minus | Black | 100 |
| 1740210-6 | 6.0 | Minus | Black | 100 |
| 1740210-7 | 2.5 | Plus | Red | 100 |
| 1740210-9 | 4.0 | Plus | Red | 100 |
| 1-1740210-1 | 6.0 | Plus | Red | 100 |
| 1740210-8 | 2.5 | Minus | Blue | 100 |
| 1-1740210-0 | 4.0 | Minus | Blue | 100 |
| 1-1740210-2 | 6.0 | Minus | Blue | 100 |

AC Inverter Connector

## Product Facts

- **Current Rating:** 25 A per Pole
- **Voltage Rating:** 400 V
- **Protection Degree:** IP67 (mated)
- **No. of Positions:** 5 Poles
- **Temperature Range:** –40 °C up to +50 °C
- **Wire Size Range:** 2.5–6.0 $mm^2$
- **Approvals:**
  • VDE certified



### Panel Mount Plug

| Part Number | Nut | Cable Length (5 x 4.0 $mm^2$) | Package Quantity |
|---|---|---|---|
| 1740483-1 | Metal | 200 mm | 24 |
| 1740483-2 | Plastic | 200 mm | 24 |

### Free Hanging Receptacle

| Part Number | Nut | Cable Length (5 x 4.0 $mm^2$) | Package Quantity |
|---|---|---|---|
| 1740479-1 | – | – | 24 |

### Complete Sets

| Part Number | Nut | Cable Length (5 x 4.0 $mm^2$) | Package Quantity |
|---|---|---|---|
| 1740493-1 | Metal | 200 mm | 24 |
| 1740493-2 | Plastic | 200 mm | 24 |

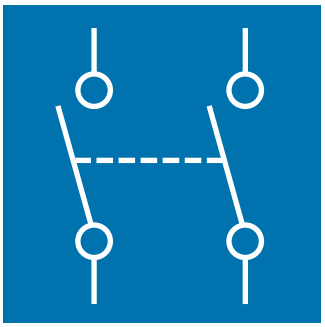


All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## Product Features

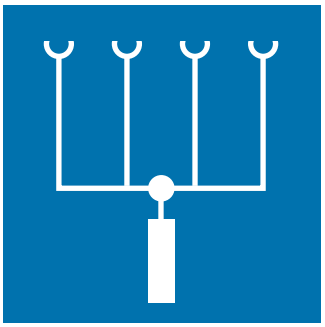
- Modular product concept
- One-/two-pole switches
- Current up to 60 A DC
- Voltage up to 1,000 V DC
- Compact, standardized design
- Proven quality
- TÜV and UL pending

### Switching



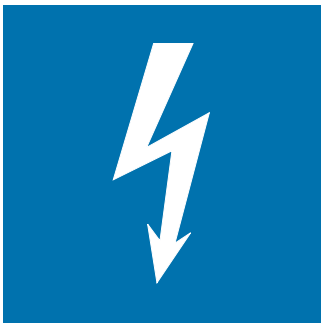
- One-/two-pole switch
- Main switch function
- Lockable
- Current up to 60 A DC
- Voltage up to 1,000 V DC

### Collecting



- 2 to 6 strings input
- Cable cross section up to 6 mm²
- SOLARLOK connectors
- Current up to 60 A DC
- Voltage up to 1,000 V DC

### Protecting



- Lightning protection

## Your Solution

The photovoltaic integrator looks for best fit solutions to wire various types and sizes of solar generators.

The new product concept from Tyco Electronics provides this flexibility to photovoltaic integrators.

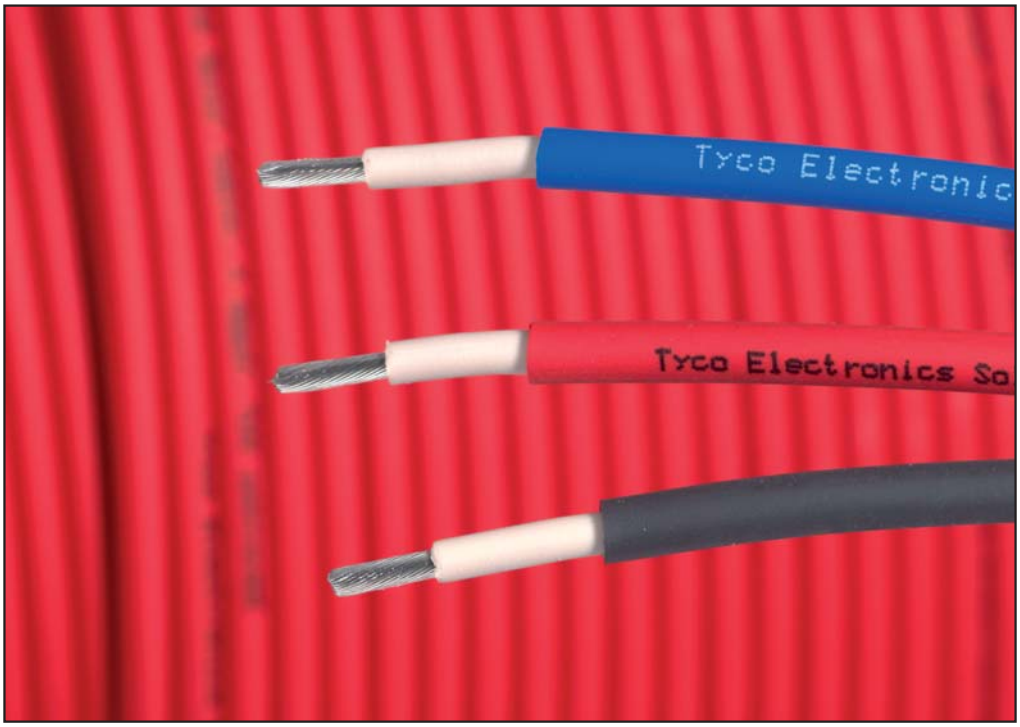
The modular product can be comprised of a switch, lightning protection, fuses or any combination of these or other commonly available components.

We can customize a product to fit your specific application. Please contact us with your requirements.

Solar Cable – TÜV and UL certified

## Product Facts

- Dual wall insulation
- Electron beam cross-linked
- Excellent resistance to UV, water, ozone, fluids, salt, general weathering
- Excellent resistance to abrasion
- Halogen free, flame retardant, low toxicity
- Very low smoke emissions
- Excellent flexibility and stripping performance
- Wire size from 2.5 mm² up to 6.0 mm²
- Safety Class II
  - TÜV approved (2Pfg1169/08.2007)
  - UL approved (Subject 4703)




As part of expanding the SOLARLOK Product Line, Tyco Electronics has specified a wire that is designed to meet the harsh environmental conditions typical in the wiring of photovoltaic installations.

The flexible, dual wall, halogen free and cross linked solar wire offers long term stability and TÜV approval.

Its outstanding features include: high resistance against environmental conditions like humidity, UV-radiation and ozone.

In addition, it has excellent resistance to abrasion and temperature extremes.

The wire has a high dielectric withstand voltage and with its fine-stranded, tin plated copper conductor, it is easy to handle and to strip.

### Standards

**Approval:**

- IEC 60228 Class 5 (stranded tin plated copper and flexible);
- TÜV certified according to 2Pfg1169/08.2007
- UL certified acc. Subject 4703

**Additional, internal tests have been carried out.**

### Material and Finish

**Conductor:**
Stranded tin plated copper

**Insulation:**
Electron beam cross-linked Polyolefin

**Sheath:**
Electron beam cross-linked halogen free Polyolefin

**Color:**
Black, Blue, Red

### Mechanical Features
(according TÜV requirements)

**Max. Conductor Temperature**
**Continuous:** +125 °C
**At Short Circuit:** +200 °C/5 s

**Min. Operating Temperature**
**Free Installation:** –40 °C
**Fixed Installation:** –60 °C

**Wire Size Range:**
2.5 mm² (AWG 14),
4.0 mm² (AWG 12),
6.0 mm² (AWG 10)

**Min. Bending Radius:**
5 x cable wire diameter, fixed installation

### Electrical Features

**Voltage Rating:**
600/1,000 V AC / 1,800 V DC

**Test Voltage for 5 Minutes:**
6 kV

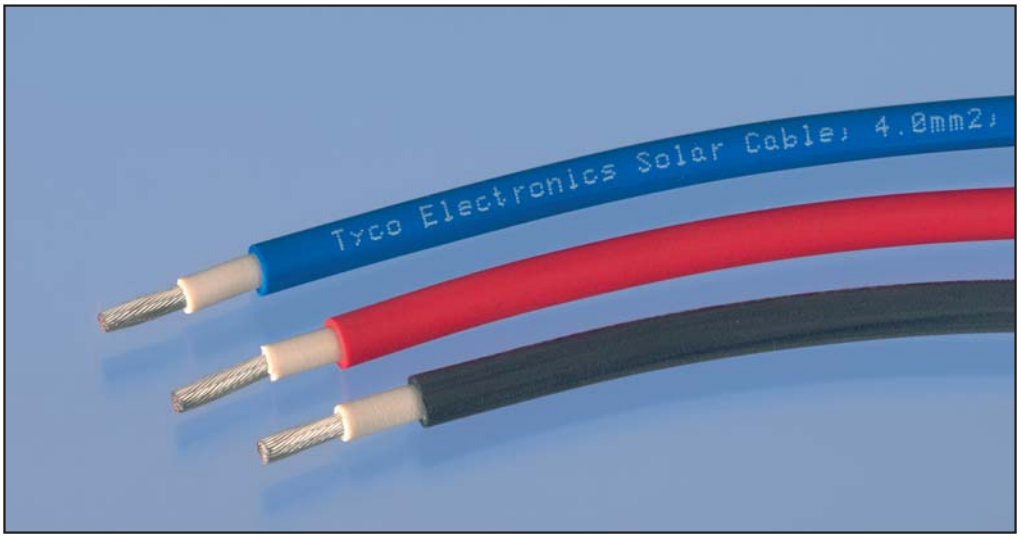
**Max. Current Carrying Capacity (Free in Air):**
2.5 mm² – 41 A
4.0 mm² – 55 A
6.0 mm² – 70 A



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## Solar Cable, 1-Pole

- **TÜV approved (2Pfg1169/08.2007)**
- **UL approved (Subject 4703)**




### TÜV Approved (ZKLA)

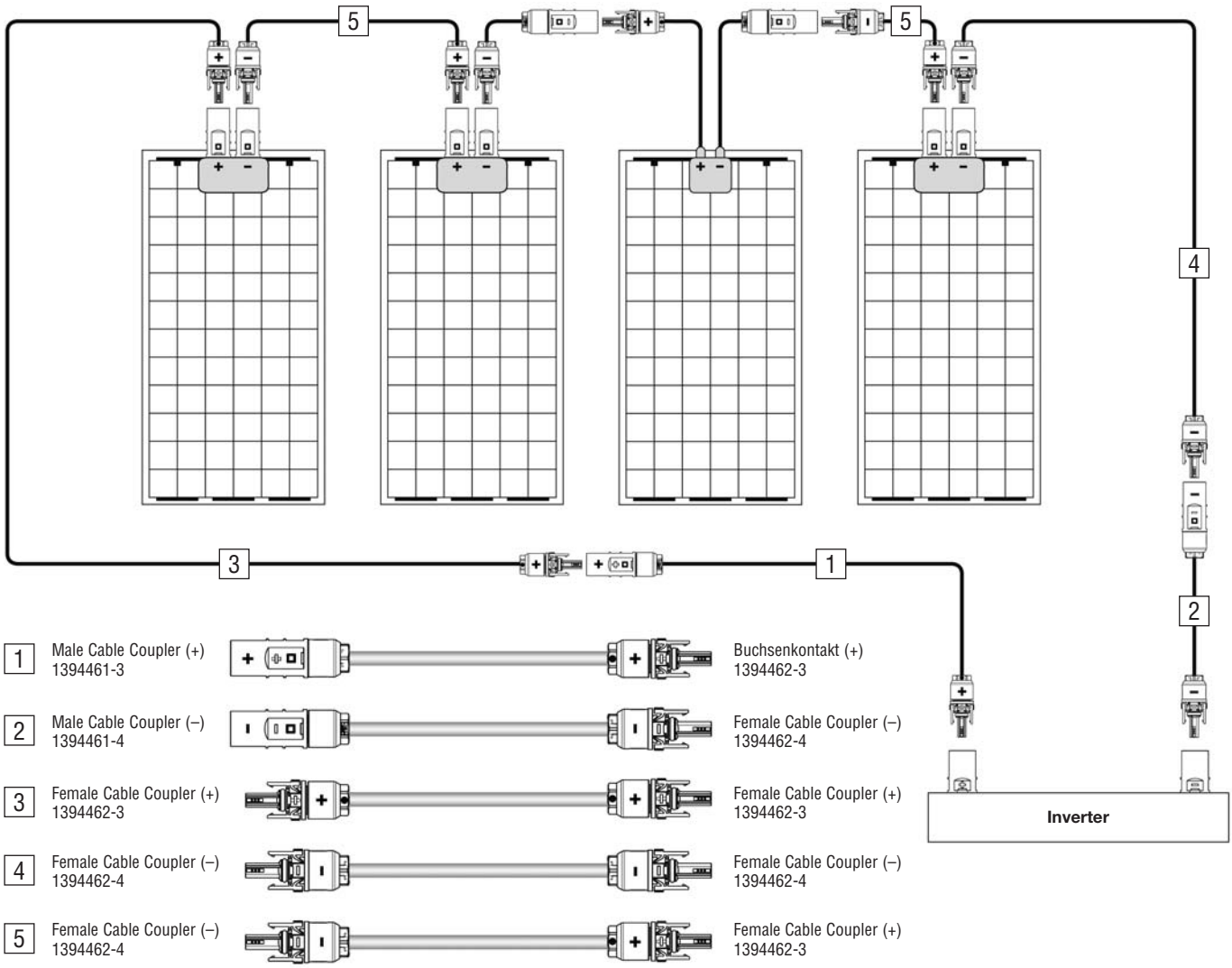
| Part Number | Cable Cross Section | | Outer Diameter | | Color | Package Quantity (m) |
|---|---|---|---|---|---|---|
| | ($mm^2$) | (AWG) | (mm) | ±Toleranz | | |
| 956297-4 | 2.5 | 14 | 6.65 | +0.15/–0.10 | Black | 500 |
| 1-956297-4 | 2.5 | 14 | 6.65 | +0.15/–0.10 | Black | 100 |
| 956297-5 | 2.5 | 14 | 6.65 | +0.15/–0.10 | Red | 500 |
| 1-956297-5 | 2.5 | 14 | 6.65 | +0.15/–0.10 | Red | 100 |
| 956297-6 | 2.5 | 14 | 6.65 | +0.15/–0.10 | Blue | 500 |
| 1-956297-6 | 2.5 | 14 | 6.65 | +0.15/–0.10 | Blue | 100 |
| 956298-4 | 4.0 | 12 | 6.90 | +0.10/–0.10 | Black | 500 |
| 1-956298-4 | 4.0 | 12 | 6.90 | +0.10/–0.10 | Black | 100 |
| 956298-5 | 4.0 | 12 | 6.90 | +0.10/–0.10 | Red | 500 |
| 1-956298-5 | 4.0 | 12 | 6.90 | +0.10/–0.10 | Red | 100 |
| 956298-6 | 4.0 | 12 | 6.90 | +0.10/–0.10 | Blue | 500 |
| 1-956298-6 | 4.0 | 12 | 6.90 | +0.10/–0.10 | Blue | 100 |
| 956299-4 | 6.0 | 10 | 7.35 | +0.30/–0.25 | Black | 500 |
| 1-956299-4 | 6.0 | 10 | 7.35 | +0.30/–0.25 | Black | 100 |
| 956299-5 | 6.0 | 10 | 7.35 | +0.30/–0.25 | Red | 500 |
| 1-956299-5 | 6.0 | 10 | 7.35 | +0.30/–0.25 | Red | 100 |
| 956299-6 | 6.0 | 10 | 7.35 | +0.30/–0.25 | Blue | 500 |
| 1-956299-6 | 6.0 | 10 | 7.35 | +0.30/–0.25 | Blue | 100 |

### UL Approved (only USE-2)

| Part Number | Cable Cross Section (AWG) | Outer Diameter (Inch) | Color | Package Quantity (Feet) |
|---|---|---|---|---|
| 1986166-1 | 14 | 0.17 | Black | 7,500 |
| 1986166-2 | 14 | 0.17 | Black | 500 |
| 1986166-3 | 14 | 0.17 | Black | 2,500 |
| 1986165-1 | 12 | 0.19 | Black | 6,000 |
| 1986165-2 | 12 | 0.19 | Black | 500 |
| 1986165-3 | 12 | 0.19 | Black | 1,600 |
| 1986164-1 | 10 | 0.21 | Black | 5,500 |
| 1986164-2 | 10 | 0.21 | Black | 500 |
| 1986164-3 | 10 | 0.21 | Black | 1,000 |

**For other Cross Sections (1.5 $mm^2$ to 400 $mm^2$) as well as technical data please contact us.**

## Wiring Example with Extension Cables




Configuration Example at 4.0 mm$^2$.

## Cable Assembly

**Wire Size:**
4.0 mm$^2$

**Color:**
Black

| Cable Assembly Version | Part Numbers for Cable Length | | | | |
|---|---|---|---|---|---|
| | 1 m | 3 m | 5 m | 10 m | 20 m |
| 1 | 1987376-1 | 1987376-2 | 1987376-3 | 1987376-4 | 1987376-5 |
| 2 | 1-1987376-1 | 1-1987376-2 | 1-1987376-3 | 1-1987376-4 | 1-1987376-5 |
| 3 | 2-1987376-1 | 2-1987376-2 | 2-1987376-3 | 2-1987376-4 | 2-1987376-5 |
| 4 | 3-1987376-1 | 3-1987376-2 | 3-1987376-3 | 3-1987376-4 | 3-1987376-5 |
| 5 | 4-1987376-1 | 4-1987376-2 | 4-1987376-3 | 4-1987376-4 | 4-1987376-5 |

**All used components are TÜV and UL approved.**

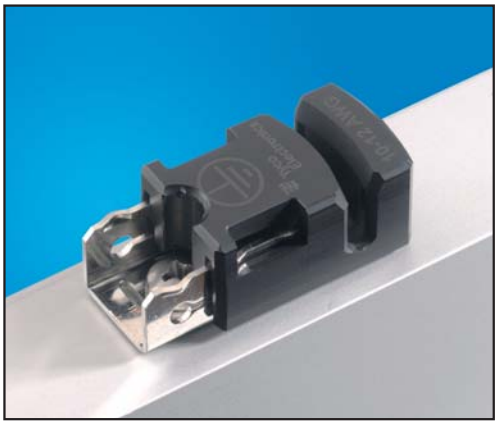
More variants (cable length, wire diameter, color) upon request.



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

## Product Features

- Self-tapping screw or nut and locking ring
- Quick and easy mounting
- Four-point contact to wire
- Low interface resistance
- Toolless termination
- Re-terminateable up to 5 times
- UV resistant
- Weather-proof
- RoHS compliant
- UL approved
- TÜV in preparation



SolKlip Grounding Clip

AWG 6-8 Grounding Connection

### Description

SolKlip ground clips are designed for solar panel grounding applications using solid un-insulated copper 10 AWG and 12 AWG.

### Applications

Solar panels and related products that require grounding for safety reasons.

Applications include: wire jumpers between solar panels, solar roof tiles and between panels and the AC/DC inverters.

### Electrical

The electrical performance of this product will meet the tough requirements of photovoltaic grounding applications.

### Product Offering & Dimensions

SolKlip for Solar Grounding (Part No. **1954381-x**) to handle solid, un-insulated ground wire from 4 $mm^2$ (AWG 12) to 6 $mm^2$ (AWG 10). For larger wires from 10 $mm^2$ (AWG 8) and 16 $mm^2$ (AWG 6) please use the AWG 6-8 Grounding Connector.

### Application Tooling

No special tooling required.

### Approvals

- UL 467 pending
- UL 486A-B pending
- TÜV in preparation

### Materials

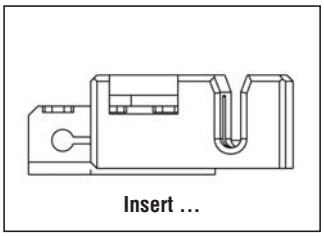
**Housing:**
Durable PPT.

**Contact:**
High conductivity copper alloy

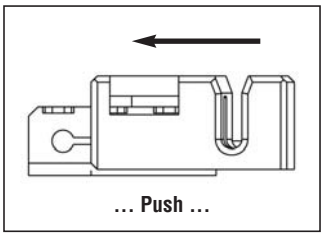
### Mechanical

The mechanical properties of this product will meet the tough requirements for grounding applications layed down in the UL requirements.

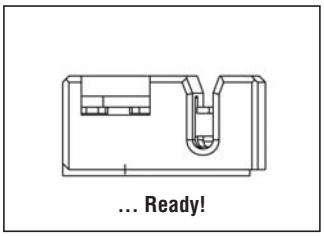
## 3 Easy Steps to Ground Your PV System



Insert …



… Push …



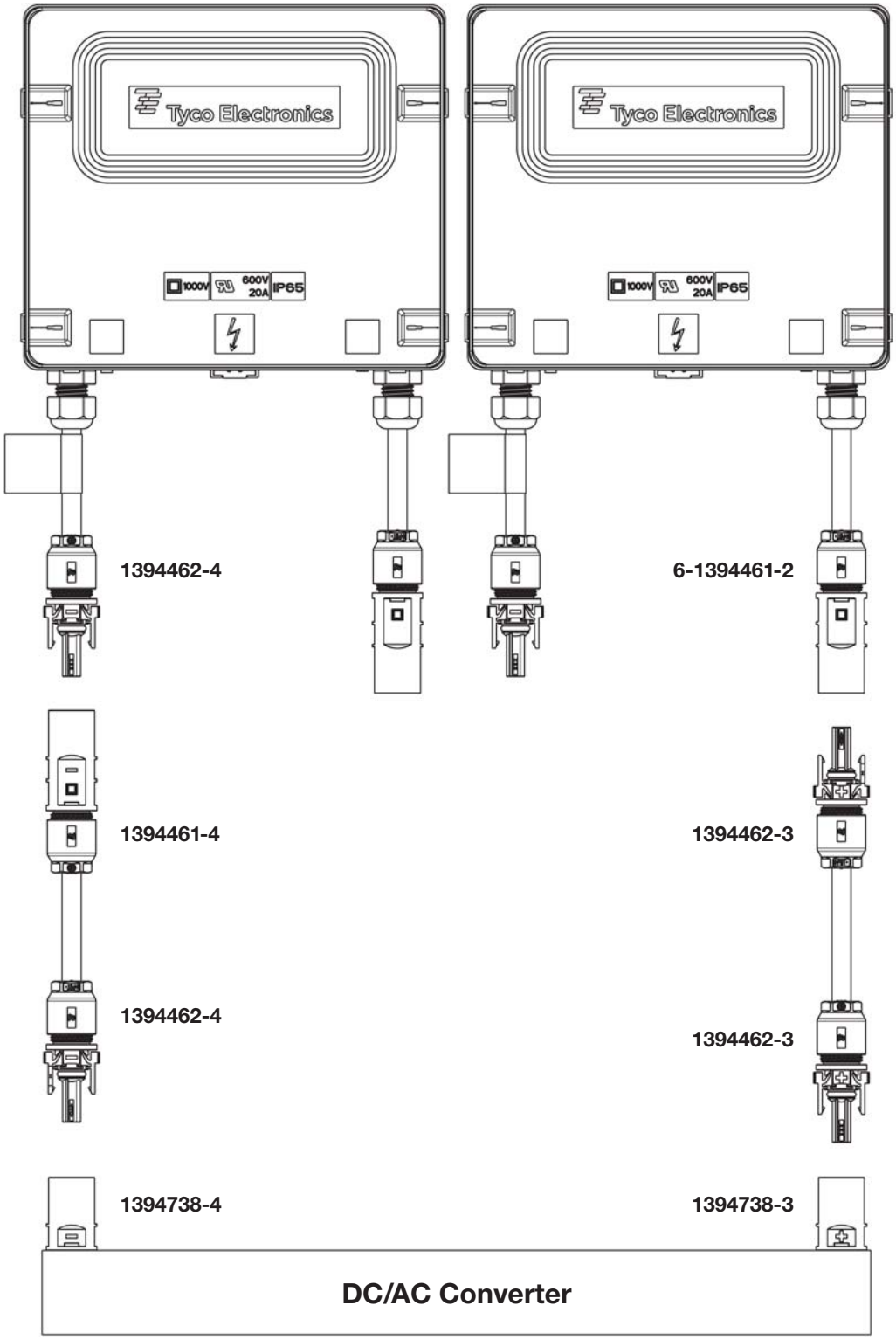
… Ready!

### Grounding Solutions

| Part Number | Description | Package Quantity |
|---|---|---|
| 1954381-1 | SolKlip with Self-Tapping Screw | 100 |
| 1954381-2 | SolKlip with Screw and Nut | 100 |
| 1954381-3 | SolKlip with Screw, Nut and Locking Ring | 100 |
| 2058729-1 | AWG 6-8 Grounding Clip | 100 |

Interconnection Examples

## Serial Interconnection for Junction Boxes with Cable Glands (4.0 mm² Wiring)

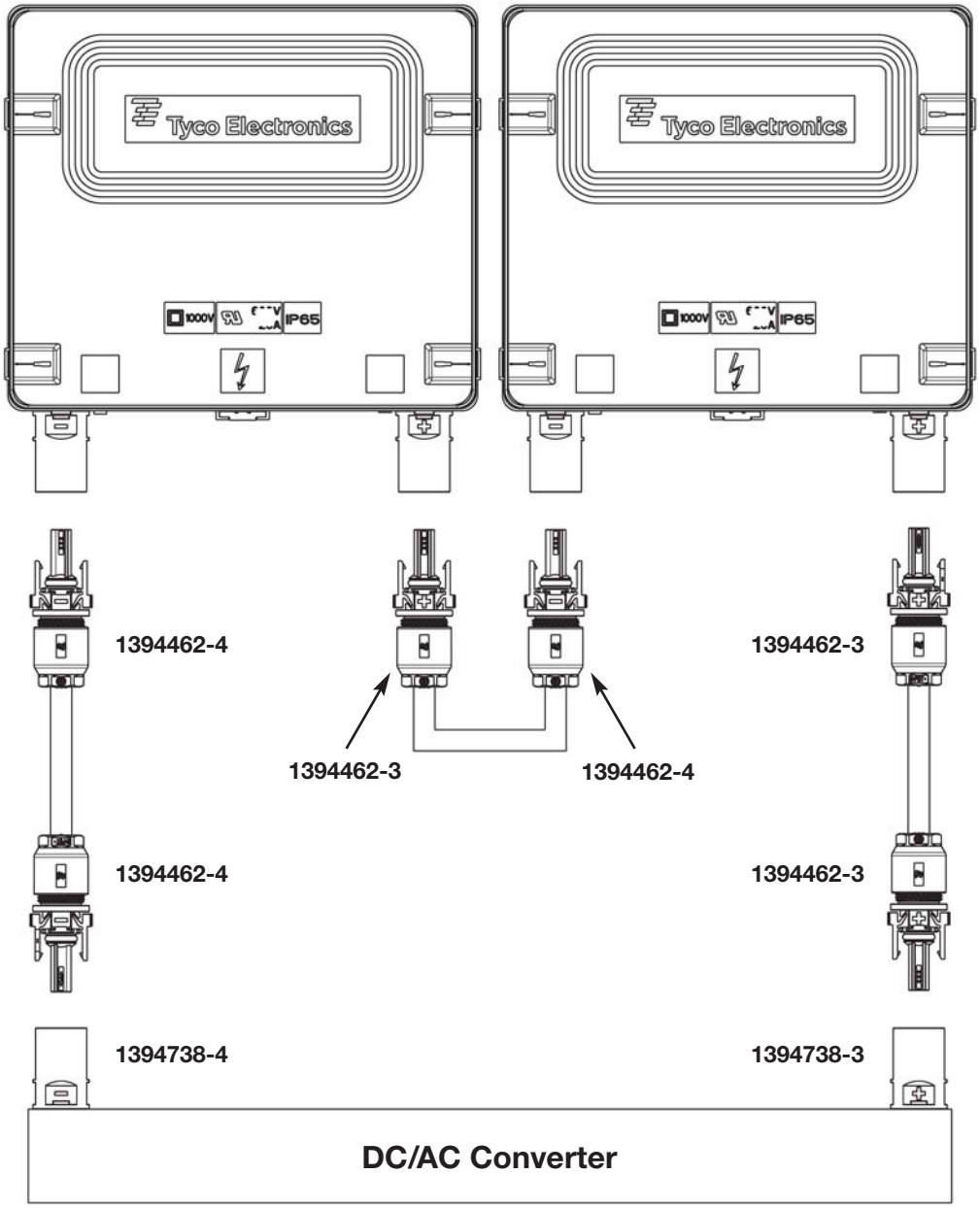





All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

Interconnection Examples (continued)

## Serial Interconnection for Junction Boxes with Plug Connectors (4.0 mm² Wiring)



Application Tooling

## Cable Assembly Tooling

**Hand Crimping Tool for Screwed Contacts**
incl. Vario Crimp Head and Locator

Part Numbers
**1-1579004-1** (1.5 + 2.5 mm²)
**1-1579004-2** (4.0 + 6.0 mm²)

**Vario Crimp Head**
**7-1579001-8** (1.5 + 2.5 mm²)
**7-1579001-9** (4.0 + 6.0 mm²)

**Hand Crimping Tool for Stamped & Formed Contacts**
incl. Vario Crimp Head and Locator

Part No. **2063900-1**
for 2.5–6.0 mm² (AWG 10–14)

**Applicator for Strip Form Contacts**
Part No. **1855503-1**

**Extraction Tool**
suitable for all wire sizes

Part No. **1102855-3**

**Insulation Stripper**
includes length stop for all wire sizes: 1.5 mm², 2.5 mm², 4.0 mm² and 6.0 mm².

Suitable for Tyco Electronics Solar Cable.

Part No. **4-1579002-2**

## SOLARLOK Electric Terminator CS 200

**Base Machine:**
Part No. **539630-1**

**Electric Terminator CS 200 for Screwed Contacts**

**Adapter for Vario Crimp Head:**
Part No. **1579000-4**

**Vario Crimp Head (1.5 and 2.5 mm²):**
Part No. **7-1579001-8**

**Vario Crimp Head (4.0 and 6.0 mm²):**
Part No. **7-1579001-9**

**Vario Crimp Head (AWG 10):**
Part No. **8-1579001-2**

**Vario Crimp Head (AWG 12):**
Part No. **5-1579001-5**



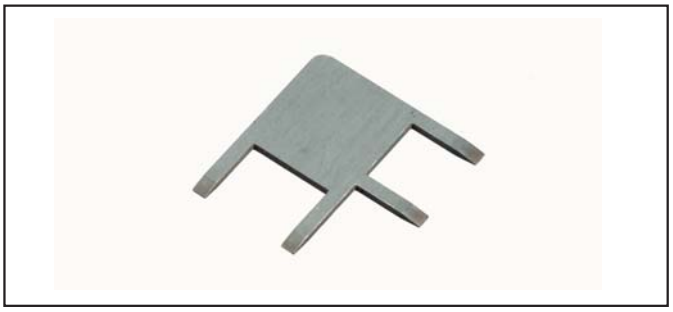
All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
Consult Tyco Electronics for latest specifications.

Application Tooling (continued)

## Junction Box Assembly Tooling

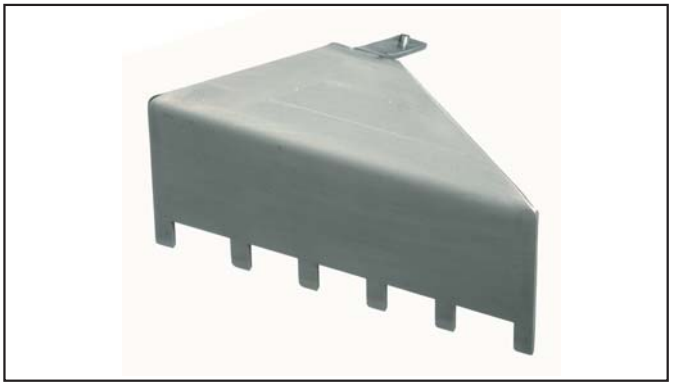
### Wire Spring Clamp Tool

Part No. **1579007-2**



### Dioden / Jumper Spring Clamp Tool

Part No. **1579007-5**



### Foil Spring Clamp Tool

Part No. **1740969-3** 5-Rail Box
Part No. **1740969-1** Medium Box
Part No. **1740969-2** Small Box

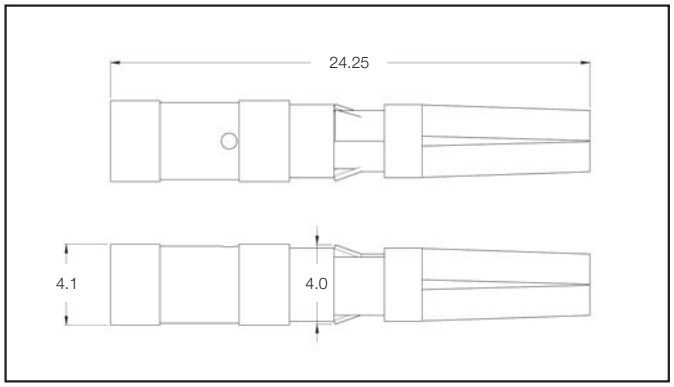
## Field Service Kit

Part No. **1534858-1**
(Metric Wire)

**Kit includes the following parts:**

- 100 Cable Coupler (Housings, Plus and Minus coded)
- Crimp Contacts (4.0 and 6.0 $mm^2$)
- Strain Relief
- Seals
- **Hand Crimp Tool:** Part No. **1-1579004-2**
- **Extraction Tool:** Part No. **1102855-3**
- **Insulation Stripper:** Part No. **4-1579002-2**

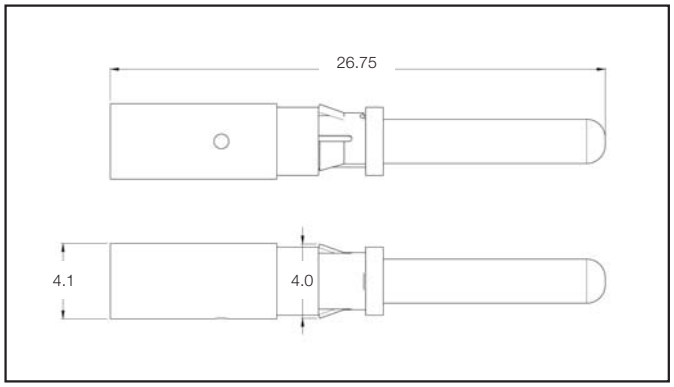
Contacts




## Female Contacts (Screw-Machined)

**Material:** Copper alloy, silver plated

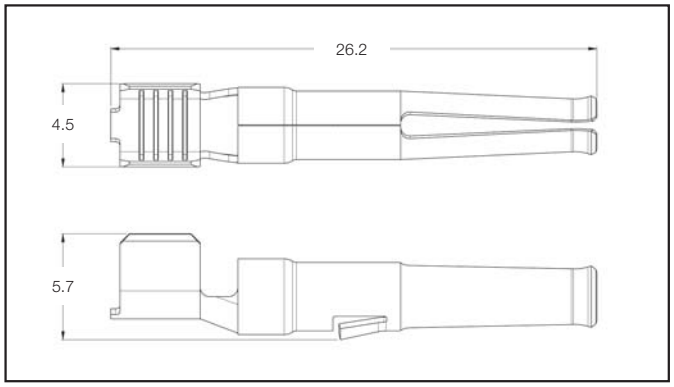
| Wire Size (mm²) | Wire Size (AWG) | Part Number | Package Quantity |
|---|---|---|---|
| 2.5 | – | 1987281-1 | 100 |
| 4.0 | – | 1987281-2 | 100 |
| 6.0 | AWG 10 | 1987281-3 | 100 |
| – | AWG 14 | 1987281-4 | 100 |
| – | AWG 12 | 1987281-5 | 100 |




## Male Contacts (Screw-Machined)

**Material:** Copper alloy, silver plated

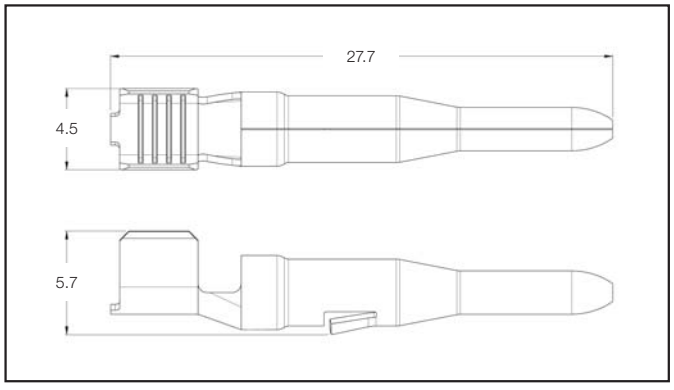
| Wire Size (mm²) | Wire Size (AWG) | Part Number | Package Quantity |
|---|---|---|---|
| 2.5 | – | 1987280-1 | 100 |
| 4.0 | – | 1987280-2 | 100 |
| 6.0 | AWG 10 | 1987280-3 | 100 |
| – | AWG 14 | 1987280-4 | 100 |
| – | AWG 12 | 1987280-5 | 100 |




## Female Contacts (Stamped and Formed)

**Material:** Copper alloy, silver plated

| Wire Size (mm²) | Wire Size (AWG) | Part Number | Package Quantity |
|---|---|---|---|
| 2.5–4.0 | 12–14 | 2058454-3 | 100 (Loose-Piece) |
| | | 2058454-2 | 6,000 (Strip Form)* |




## Male Contacts (Stamped and Formed)

**Material:** Copper alloy, silver plated

| Wire Size (mm²) | Wire Size (AWG) | Part Number | Package Quantity |
|---|---|---|---|
| 2.5–4.0 | 12–14 | 2058453-3 | 100 (Loose-Piece) |
| | | 2058453-2 | 6,000 (Strip Form)* |

*) **Note:** Strip Form is only suitable for processing with Applicator, Part No. **1855503-1.**



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
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# SOLARLOK Plug Connector

**Attention: This connector is to be used only to interconnect firmly fixed cables.**

**Do not disconnect under load.**
Current path should only be disconnected using approved disconnect devices.

Cable assemblies shall be labeled with Part No. **1394470-1.**

**To protect against shock, ensure that conductors and their associated connectors are separated from opposite polarity components.**

## IMPORTANT NOTE

**Mounting and installation must be done by qualified and trained staff considering all applying safety regulations. Tyco Electronics disclaims any warranty as a result of non-compliance to these notes.**

## 1. General Comments

Any kind of pollution (dust, oil, humidity, etc.) during the assembly process or to the unmated connector can degrade contact and connector performance. This applies in particular to the seals and the crimping of the contacts.

A clean assembly environment is therefore essential.

## 2. Termination of the Cable Wires and Crimping of the Contacts

SOLARLOK connectors use different crimp contacts for various wire gauges.
Possible wire gauges are 2.5 $mm^2$, 4.0 $mm^2$, 5.3 $mm^2$ und 6.0 $mm^2$ resp.
AWG 14, AWG 12 and AWG 10.

The tools to be used are selected based upon the wire gauge.
For the application specification, please refer to specification # 114-74013.

## 3. Handling of the Connectors

### 3.1 Selection of Sealing Grommet for Cable Connectors

Use only appropriate wire gauges.
Besides the standard seal/pinch ring combination further five different seals are available.

- 4.0 mm grommet inner diameter (for insulation diameter from 3.2 to 4.3 mm), Part No. **1394465-5**
- 5.0 mm grommet inner diameter (for insulation diameter from 4.3 to 5.3 mm), Part No. **1394465-1**
- 6.0 mm grommet inner diameter (for insulation diameter from 5.3 to 6.2 mm), Part No. **1394465-2**
- 7.0 mm grommet inner diameter (for insulation diameter from 6.2 to 7.2 mm), Part No. **1394465-3**
- 8.0 mm grommet inner diameter (for insulation diameter from 7.2 to 8.0 mm), Part No. **1394465-4**

The grommet has to be matched with the outer diameter of the solar cable (see customer drawing, Part No. **1394461** and Part No. **1394462)** and the pinch ring (Part No. **1418677-2)** must be applied.

## Assembly and Installation Guidelines (continued)

When assembling the connectors, the following sequence must be followed:

① Stripping the Wire (please refer to application specification # 114-74013).

Fig. 1

② Insert the stripped wire into the wire crimp barrel until it stops.
While holding the wire in place, squeeze tool handles together until ratchet releases.

Fig. 2

③ Push contact with cable into the connector housing (incl. seal/pinch ring combination and backshell) until you hear the contact is locked into position.

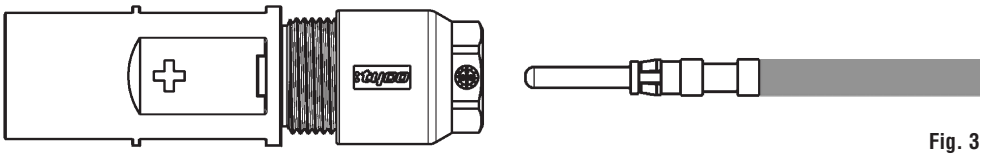
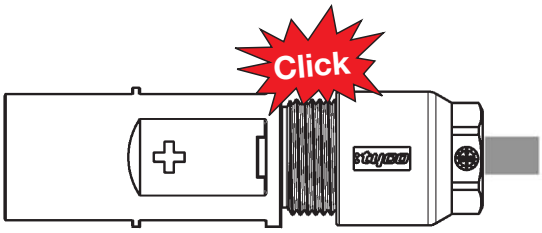


Fig. 3




④ Tighten backshell nut to 1.5 Nm.

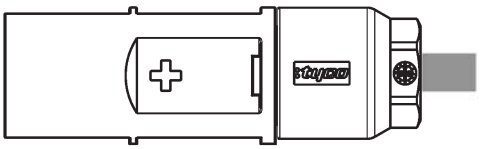


Fig. 4



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
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Assembly and Installation Guidelines (continued)

### 3.2 Connector Latching

When mating the SOLARLOK connectors, ensure the following:

- Connectors labeled with a plus or minus are keyed and can only be mated to similarly marked and keyed connectors.

**CAUTION:**
**The "neutral" designated pin connectors incorporate no keying features and must only be used for Serial Interconnection of Photovoltaic Modules.**
**The neutral product should not be used where maintaining polarity is critical.**

The polarity of the "neutral" connector must labeled with Part No. **1394725-1** or Part No. **1394725-2** nearby the connector.

- The connector system is fully latched only when the latches are flush with the mating connector.
- After the connector is fully latched, the optional latch locking clip may be snapped into place.

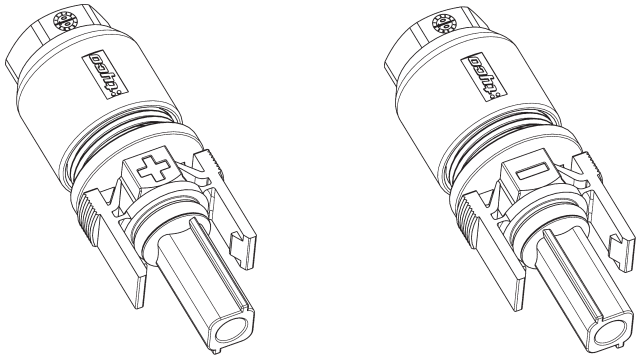

**Fig. 5**
(Female Connector)

### 3.3 Disconnecting

**CAUTION: This connector must not be disconnected under load.**

Disconnect circuit from load before unplugging connectors.

Cable assemblies should be labeled using Tyco Electronics Label, Part No. **1394470-1.**

**Unmating of the connector** **CAUTION: Do not disconnect the connector under load!**

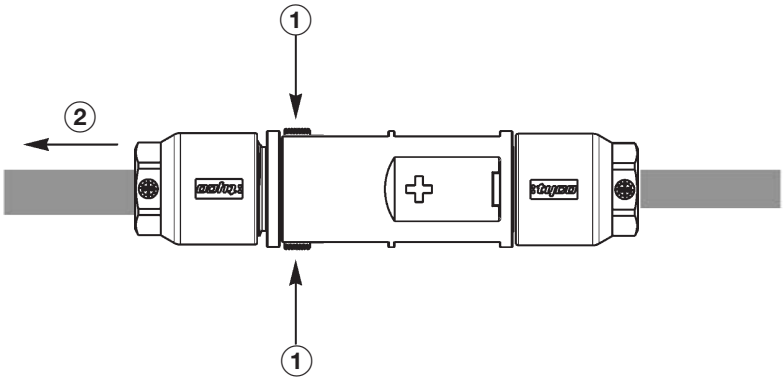


**Fig. 6**

① The locking mechanism is opened by depressing the latches.

② Pull out the connectors. While depressing the latches, disconnect the connector by pulling the connector halves apart.

## 4. Application Examples

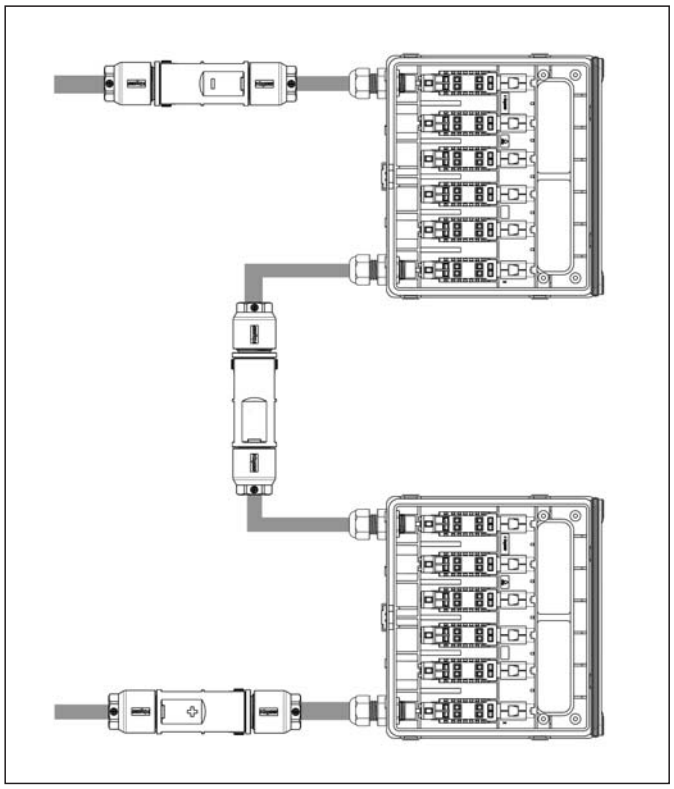

**Abb. 7:** Serial (Wire Diagram)

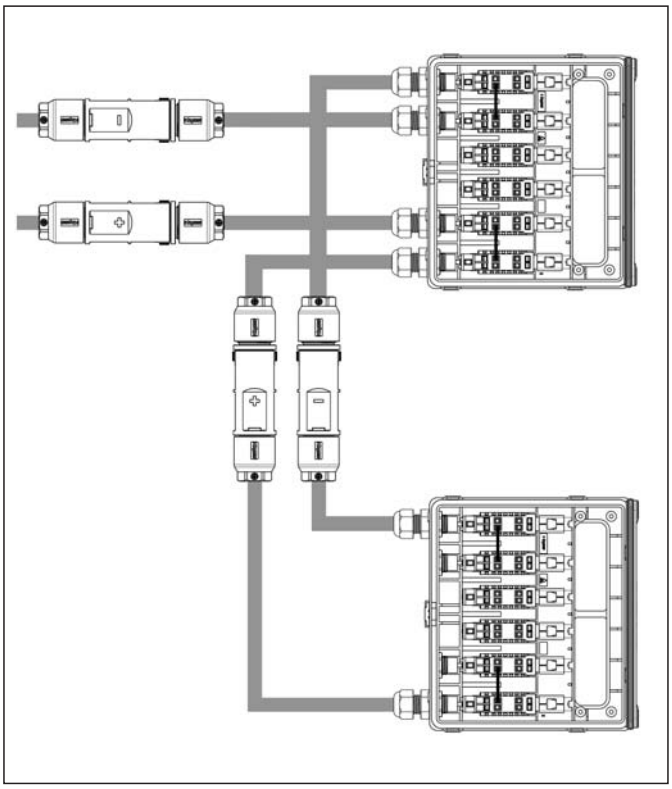

**Abb. 8:** Parallel (Wire Diagram)

## 5. Storage

See Product Specification 108-18701

## 6. Tooling

- Find available tools for the contact crimping on page 26 (please specify required wire gauge).
- An extraction tool (Part No. **1102855-3)** is needed to disassemble the connector components. This tool is used to unlock the contact retention features, after which the contact can be removed and re-used if necessary.

### Technical Description

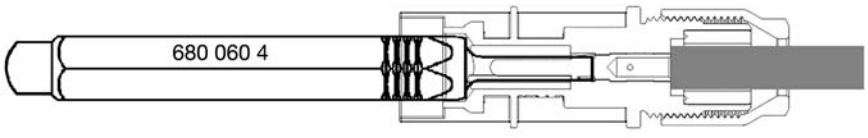


**Fig. 9**



All dimensions are in millimeters unless otherwise specified. All specifications subject to change.
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Technical Data (Junction Box and One Pole Plug Connectors)

## Materials

| | |
|---|---|
| Socket and Pin Contacts: | CuZn |
| Housing: | PPO, weatherproof against UV radiation and ozone |

### Color

| | |
|---|---|
| Connector, Junction Box: | Black |

## Electrical Features

| | |
|---|---|
| Withstanding Voltage: | 1000 V DC |
| Current Rating: | up to 25 A |
| Contact Resistance: | $\leq$5 m$\Omega$ |
| Contact Resistance (typical): | 1 m$\Omega$ |
| Protection Class: | II |

## Mechanical Features

### Junction Boxes

| | |
|---|---|
| Dimensions: | Depending on junction box type |
| Temperature Range: | –40 °C to +105 °C |
| Wire Size Range: | up to AWG 12 |
| Protection Degree: | IP 65, closed |

### Connector

| | |
|---|---|
| Dimensions: | Diameter 18 mm, (diameter 0.71 inch) |
| Temperature Range: | –40 °C to +105 °C |
| Wire Size Range: | AWG 14, AWG 12, AWG 10 stranded wire |
| Protection Degree: | IP 67, mated |
| Contact Finish: | silver plated, |
| Mating Cycles: | 50, silver plated |
| Unmating Force: | 30–40 Newton |
| Additional Features: | Coded housing ensures mating safety<br>Contact voltage-proof<br>Connector with crimp technology |
| **Standards** | IEC 61215 Edition 2, 61646, IEC 61730,<br>Protection Class II, UL 1703 |

**Subject to Change.**

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- Downloadable Technical Data Customer Information Presentation
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Tyco Electronics

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889753-3 Revised 9-2009 12M ST

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