SOLARLOK

Connectivity Systems for PV Solutions

Building a greener tomorrow

As solar becomes an increasingly viable and competitive source of alternative energy, TE Solar works with you every step of the way to solve your connectivity challenges. Our proven expertise, cross-industry innovation and broad range of connectivity solutions are establishing the intelligent link between the panel and the grid—and driving the future of solar energy.

Early involvement pays off in competition advantage

With approximately 7,000 engineers and 11 global design centers, plus manufacturing facilities in approximately 25 countries, we put a premium on innovation when it comes to helping companies solve tough design problems. Talking to us early on in your design cycle will give you the full benefit of our expertise.

We can help you:

Shorten the design cycle

Reduce costs

Increase reliability

Design for manufacturability

In short, we can help you achieve a sustainable competitive advantage. Whether it's showing you the best existing products, offering a value added solution or designing a new product, our commitment to advanced engineering and world-class manufacturing delivers innovation that can advance any solar project. Our Electronic Components segment is a world leader in passive electronic components, including connectors and interconnect systems, relays, switches, circuit protection devices, touchscreens, sensors, and wire and cable. TE's ability to serve your present and future requirements is realized through the synergies of a strong R&D program and our expertise in materials science, product design and process engineering, all supported by our network of 5000-plus knowledgeable, sales representatives and customer service personnel.

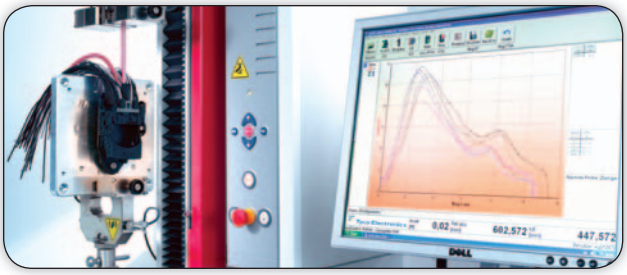
TE Global Design Centers

1 : Harrisburg, PA : USA
2 : Greensboro/Winston-Salem, NC : USA
3 : Menlo Park, CA : USA
4 : Wilsonville, OR : USA
5 : Eatontown, NJ : USA
6 : Kawasaki, Japan
7 : Bensheim, Germany
8 : Shanghai, China
9 : Kessel-Lo, Belgium
10 : s'Hertogenbosch, Netherlands
11 : Kyungsan, Korea

Solar Manufacturing Facilities

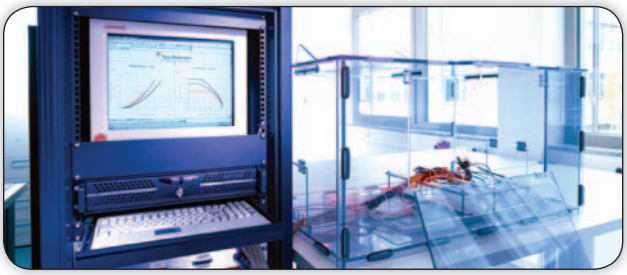
A : Trutnov, Czech Republic
B : Greensboro, NC : USA
C : Empalme, Mexico
D : Hermosilla, Mexico
E : DongGuann, China
F : Shanghai, China
G : QingDao, China

Mechanical, Environmental and Electrical Testing Capabilities



Mechanical Testing Equipment

Force-deflection curves are generated to verify that spring contact properties meet design criteria.

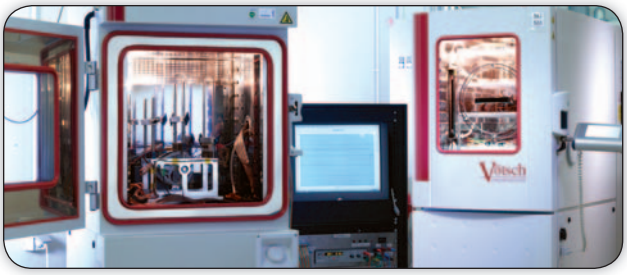


Electrical and Thermal Test Equipment

Contact resistance and temperature rise are measured and recorded automatically. These parameters help to establish/verify current carrying capacity, and de-rating curves. Test samples are isolated to minimize the influence of external variables such as air movement.

Climate cabinets and temperature shock chambers

Components/assemblies are exposed to cold, heat, moisture, and temperature change. Thermal shock is accomplished with the 2-chamber method. Environmental chambers operate from -70°C to +180°C enabling simulation of real-world conditions.



4-component pollutant gas unit/crimp validation

Slow-motion bending and vibration testing simulates line movements in the wire, stressing the crimped termination. Industrial atmospheres are generated with a gas mixture of SO_2, H_2S, NO_2 and Cl_2.

3D X-ray computer tomography

3D X-ray computer tomography provides high resolution three-dimensional non-destructive analysis capability.

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Manufacturing Capabilities

TE manufactures the SOLARLOK product line on state of the art manufacturing equipment.

The Trutnov, Czech Republic facility offers a repeatable manufacturing process which produces a 100% automatically inspected and electrically tested junction box. For quality control purposes, each junction jox is “laser etched” with a unique serial number.

Our electrical test equipment has four independent heads to automatically test each connection rail and diode in the popular four rail junction box. Assembly equipment automatically verifies the production of the cable assemblies and attachment to the junction box. The true position of the contact in the mating coupler housing and proper torque of the screw nut are some of the critical process checks made to each unit. A vision system is incorporated into the junction box assembly equipment. Polarization and molded features are inspected by the same vision system to contribute to the production of a quality product and a repeatable manufacturing process.

The SOLARLOK product is currently manufactured in Europe, Asia and the USA.

TE Manufacturing Facility in Trutnov, Czech Republic

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The SOLARLOK Product Concept

System Features

Junction Box

- Variable wiring options
- 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

Cable Couplers

- 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

- More than 50 years of expected lifetime (acc. to TUV 2PfG1169/08.2007)
- More than 50% higher insulation resistance provides a superior safety
- Can withstand the lowest temperature in its range (-60°C at fixed installation)
- Nominal Voltage: 1800/3000 V AC – 2600 V DC
- 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
- Excellent flexibility and stripping performance
- Temperature Rating : –40°C up to +125°C

Simple and Reliable Interconnection of Solar Systems

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.

TE has contributed to the establishment of this environmentally-friendly technology with the introduction of its SOLARLOK connector system.

The SOLARLOK connector system delivers a flexible system solution for easy and reliable interconnections from photovoltaic modules to the DC 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. If required by the customer, the junction box can be delivered pre-configured with diodes, jumpers, plug connectors, and solar cable pigtails.

The male and female cable couplers were 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 a 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.

Catalog 4-1773464-4 | Issue Date 06/2012

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Table of Contents

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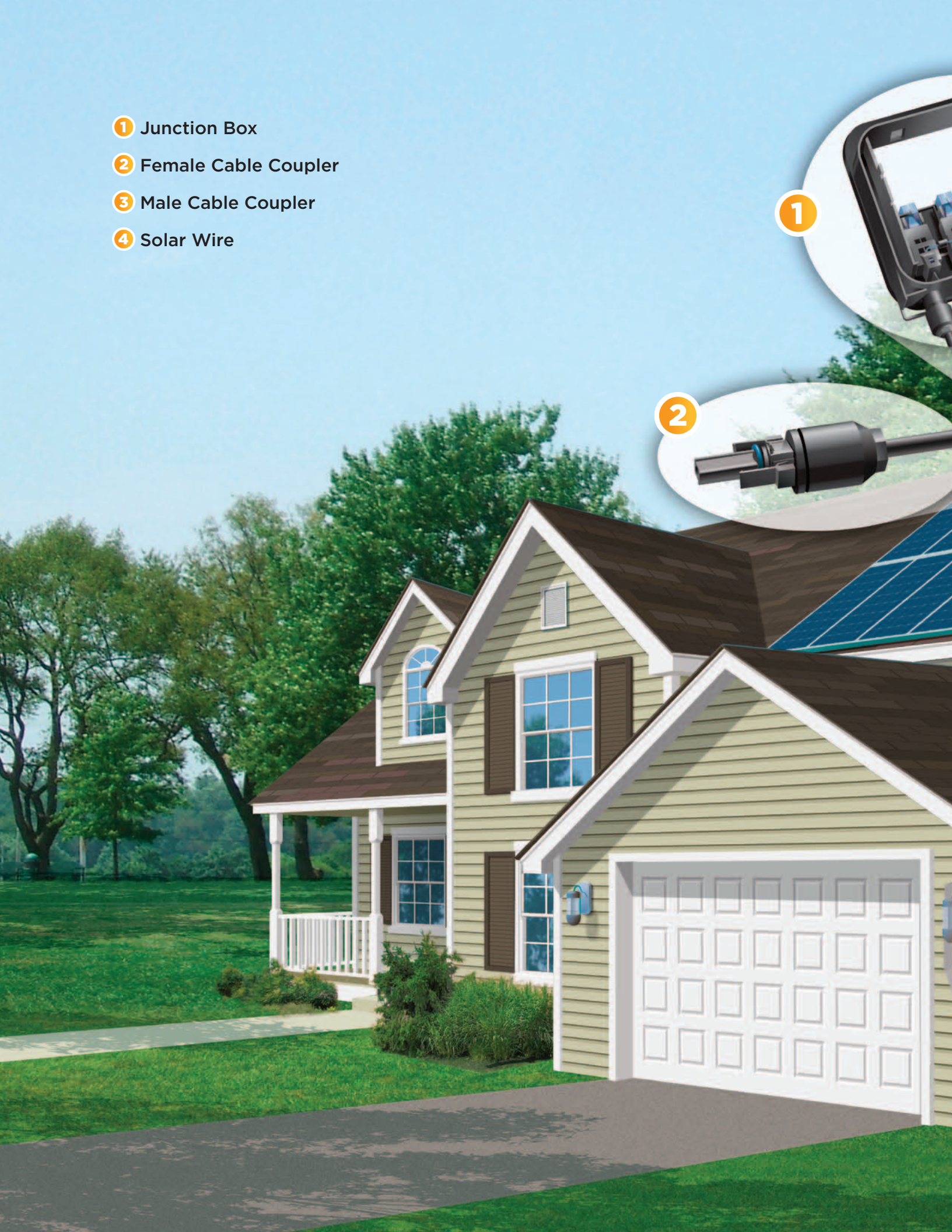
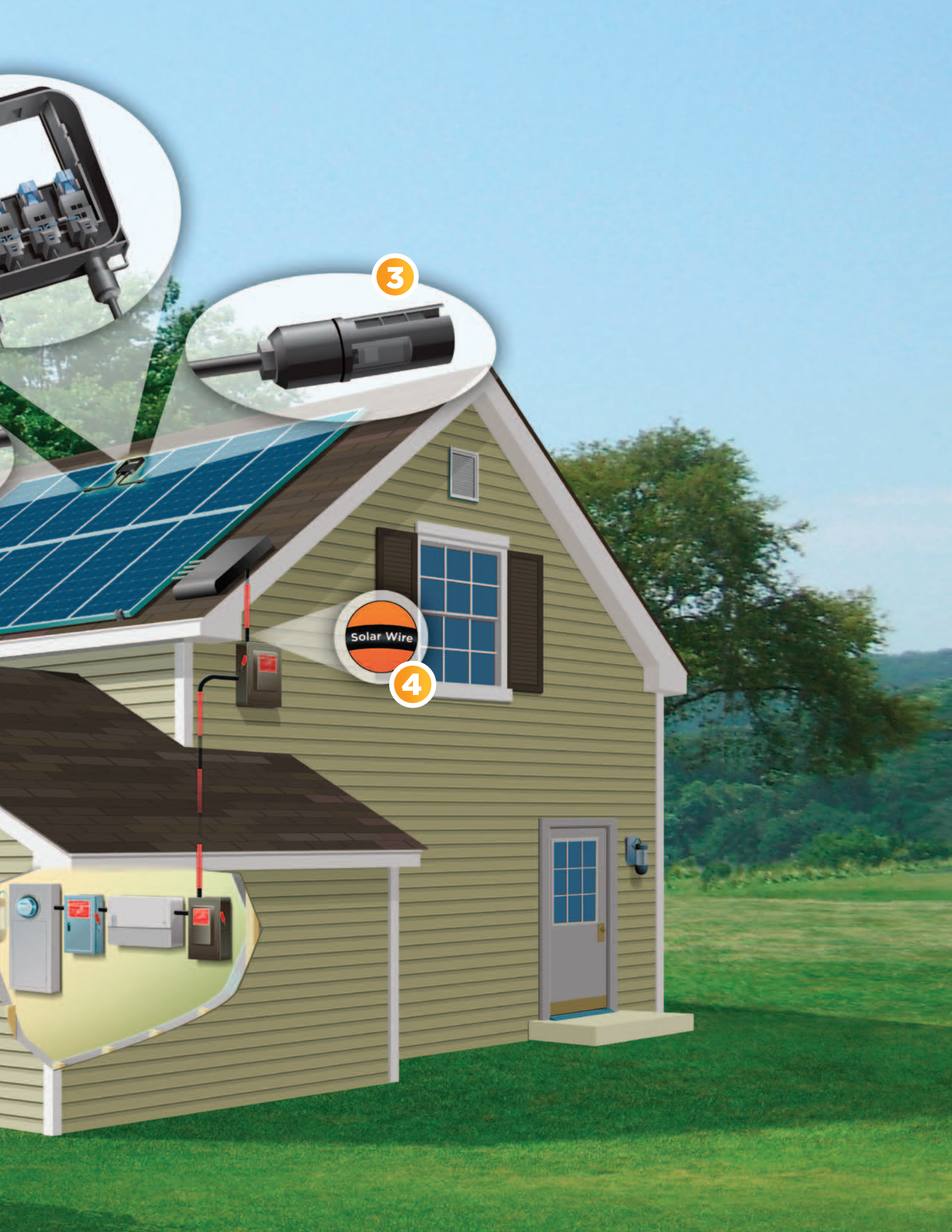

1 Junction Box
2 Female Cable Coupler
3 Male Cable Coupler
4 Solar Wire
1
2


3
Solar Wire
4

Large Junction Box : Serial Interconnection

Technical Data

Materials

Socket and Pin Contacts : CuZn

Housing : PPE+PS, weatherproof against UV radiation ozone

Contact Rail : Bright tin over copper

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating : Up to 25 A

Protection Class : II

Mechanical Features

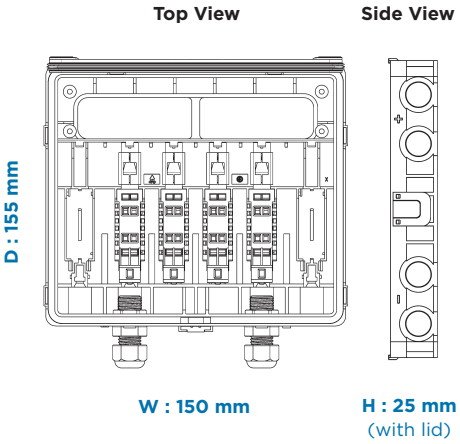
Temperature Range : -40°C to + 105°C

Wire Size Range : Up to 12 AWG, 4 mm^2

Protection Degree : IP 65, closed

Standards

TÜV approved to IEC 61215 ed. 2 approved



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)	Wire Size AWG
1740300-2	6	5	6.0	1,000	4.0	12
1987294-2	6	5	8.5	1,000	4.0	12
1987254-2	6	5	13.0	1,000	4.0	12
1740077-1	4	3	6.0	1,000	4.0	12
1740077-3	4	3	8.5	1,000	4.0	12
on request	4	3	13.0	1,000	4.0	12

Junction Box with Connector Outlet

Part Number	Contact Rails	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)
3-1394723-0	6	5	6.0
6-1394735-5	6	5	8.5
6-1394723-4	6	5	13.0
2-1394723-4	4	3	6.0
on request	4	3	8.5
5-1394723-3	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)

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5-Rail Junction Box : Serial Interconnection

Technical Data

Materials

Socket and Pin Contacts : CuZn

Housing : PPE+PS, weatherproof against UV radiation ozone

Contact Rail : Bright tin over copper

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating : Up to 25 A

Protection Class : II

Mechanical Features

Temperature Range : -40°C to + 115°C

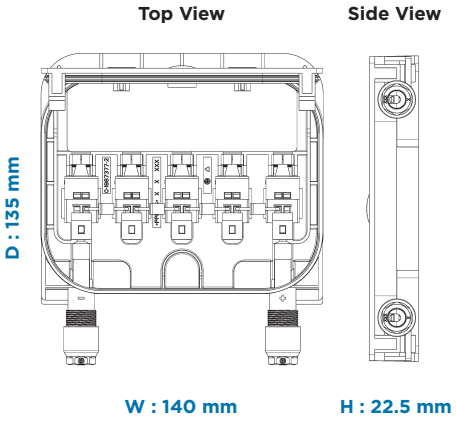
Wire Size Range : Up to 12 AWG, 4 mm²

Protection Degree : IP 65, closed

Standards

UL approved

TÜV approved to IEC 61215 ed. 2 approved



Junction Box with Mounted Cable and Connectors

Part Number	Contact Rails	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)	Cable Length (mm)	Wire Size (mm²)	AWG
1987858-3	5	4	8.5	1,000	4.0	12
1987982-3	5	4	13.0	1,000	4.0	12

Junction Box with Connector Outlet

Part Number	ContactRails	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)
on request	5	4	8.5
on request	5	4	13.0

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China: +86 (0) 400-820-6015

Automated Junction Box : Serial Interconnection

Technical Data

Materials

Housing : PPE+PS,
weatherproof against UV radiation ozone

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating : Up to 14 A

Mechanical Features

Temperature Range : -40°C to + 115°C

Wire Size Range : Up to 12 AWG, 4 mm^2

Protection Degree : IP 65, closed

Standards

UL approved

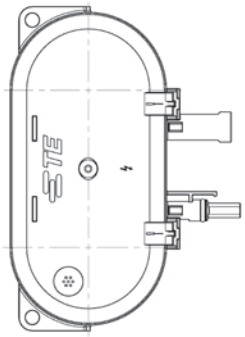
TÜV approved

Part Number

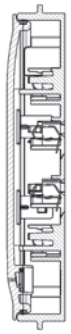
x-2120098-1-y

D : 145 mm

Top View

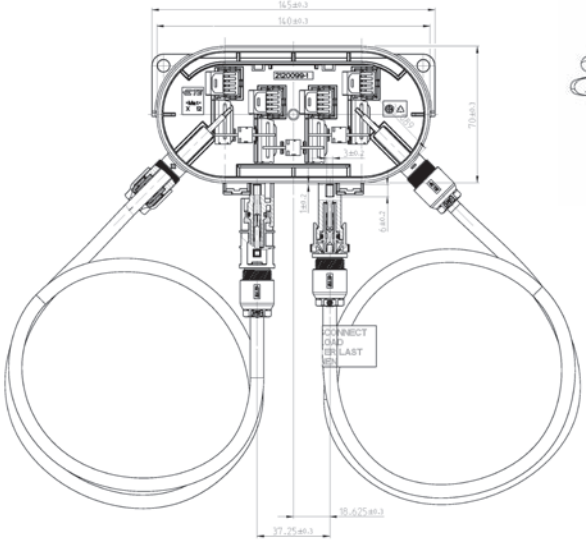


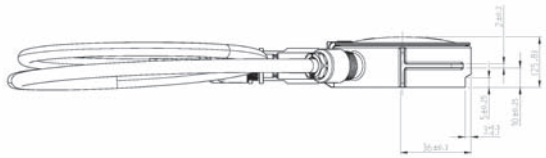
Side View



W : 70 mm

H : 25 mm





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Z-Rail Junction Box: Serial Interconnection

Technical Data

Materials

Housing : PPE+PS,
weatherproof against UV radiation ozone

Contact Rail : Tin plated copper alloy

Electrical Features

Withstanding Voltage :
1000 V (TÜV) / 600 V (UL)

Current Rating : Up to 13 A

Mechanical Features

Temperature Range : -40°C to + 115°C

Wire Size Range : 12 AWG, 4 mm^2

Protection Degree : IP 65, closed

Standards

UL approved

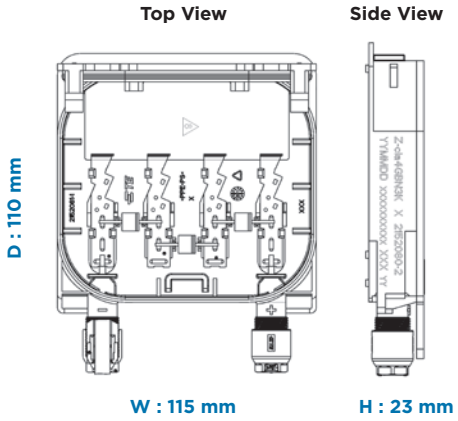
TÜV approved

Part Numbers

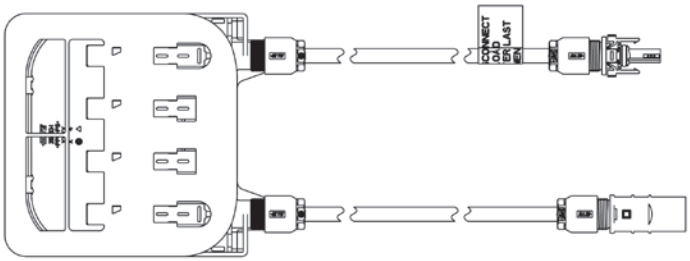
Clamp Version : y-2152080-x

Solder Version : y-2152099-x

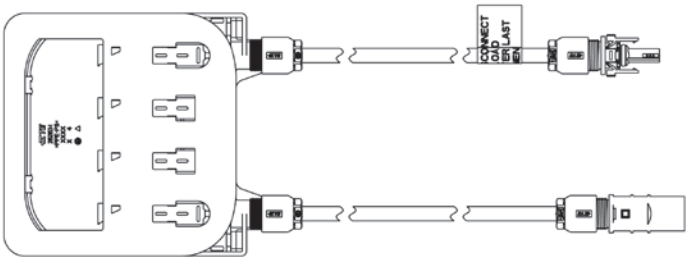
Weld Version : y-2152177-x



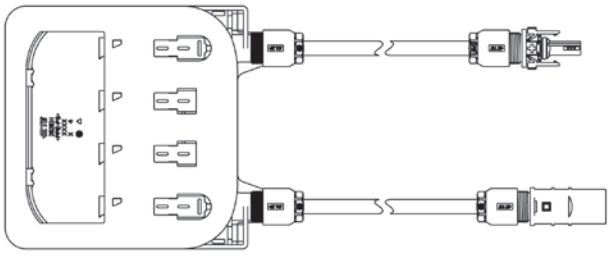
Soldered Version Potted



Clamp Version



Weldes Version



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Medium Junction Box : Serial Interconnection

Technical Data

Materials

Socket and Pin Contacts : CuZn

Housing : PPE+PS, weatherproof against UV radiation ozone

Contact Rail : Bright tin over copper

Lid : Impact resistant P.C.

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating : Up to 25 A

Protection Class : II

Mechanical Features

Temperature Range : -40°C to + 115°C

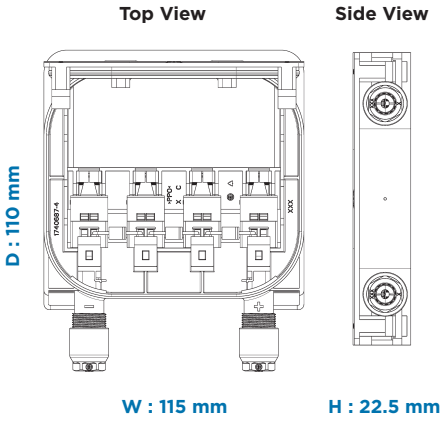
Wire Size Range : Up to 12 AWG, 4mm²

Protection Degree : IP 65, closed

Standards

UL approved

TÜV approved to IEC 61215 ed. 2 approved



Junction Box with Mounted Cable and Connectors

Part Number	Contact Rails	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)	Cable Length (mm)	Wire Size (mm²)	AWG
1987002-4	4	3	6.0	1,000	4.0	12
1740699-6	4	3	9.3	1,000	4.0	12
1740971-2	4	3	13.0	1,000	4.0	12

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	9.3
1740972-1	4	3	13.0

Special Version

Part Number	Contact Rails	Diodes	Withstanding Voltage
x-2120634-x	4	3	1000 V (UL & TÜV)

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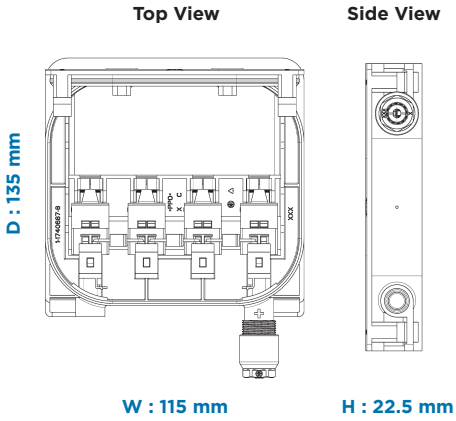
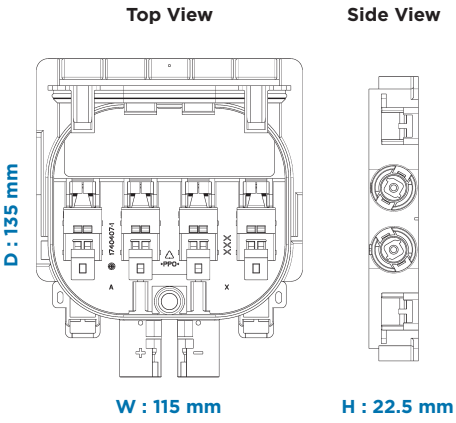
Medium Junction Box : Serial Interconnection : Special Versions

Technical Data



Junction Box with Mounted Cable and Connectors

Part Number	Contact Rails	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)	Cable Length (mm)	Wire Size (mm²)	AWG	Comments
3-1740699-9	4	3	9.3	1,000	4.0	12	Male contact (neutral) right, left closed
3-1740699-8	4	3	9.3	1,000	4.0	12	Female contact (neutral) left, right closed
1987994-1	4	3	13.0	1,000	4.0	12	Male contact (neutral) right, left closed
1987995-1	4	3	13.0	1,000	4.0	12	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 (mm²)	AWG	Comments
1740657-8	4	3	8.5	1,000	4.0	12	with mounted cable
1-1740657-2	4	3	9.5	1,000	4.0	12	with mounted cable

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Breeze Junction Box : Serial Interconnection

Technical Data

Materials

Socket and Pin Contacts : Copper alloy with tin plated

Housing : R3 (UL94-V0/5VA, f1)

Lid : R2 (UL94-V0/5VA, f1)

Contact Rail : Copper alloy with tin plated

Electrical Features

Withstanding Voltage : 1000 V DC (TÜV)

600 V DC (UL)

Current Rating : 11 A (bypass mode)

Protection Class : II

Mechanical Features

Temperature Range : -40°C to +90°C

Wire Size Range : Up to 12 AWG, 4 mm^2

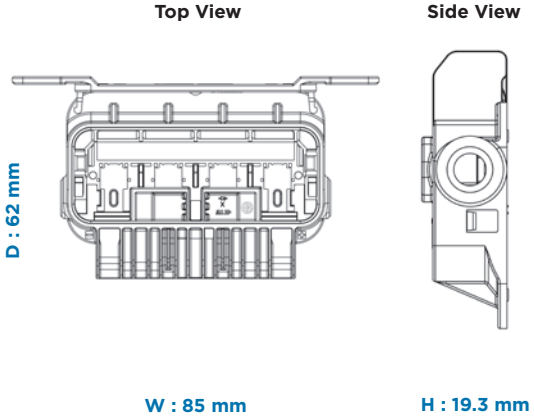
Protection Degree : IP 67, closed

Foil Tab Connection : Soldering

Standards

UL pending

TÜV 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)	Wire Size AWG
1971867-1	4	3	11	900	4.0	12

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Small 3-Rail Junction Box : Serial Interconnection

Technical Data

Materials

Socket and Pin Contacts : CuZn

Housing : PPE+PS, weatherproof against UV radiation ozone

Contact Rail : Bright tin over copper

Lid : Impact resistant P.C.

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating : Up to 25 A

Protection Class : II

Mechanical Features

Temperature Range : -40°C to +115°C

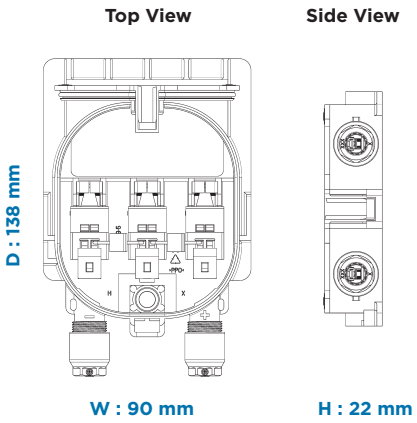
Wire Size Range : Up to 12 AWG, 4mm²

Protection Degree : IP 65, closed

Standards

UL approved

TÜV approved to IEC 61215 ed. 2 approved



Junction Box with Mounted Cable and Connectors

Part Number	Contact Rails	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)	Cable Length (mm)	Wire Size (mm²)	AWG
1740425-5	3	2	6.5	1,000	4.0	12
1987252-6	3	2	10.5	1,000	4.0	12
1987252-1	3	2	14.0	1,000	4.0	12

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
1987771-1	3	2	14.0

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800

Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666

France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

Decentralized 2-Rail Junction Box : Serial Interconnection

Technical Data

Materials

Housing : PPE+PS,
weatherproof against UV radiation ozone

Electrical Features

Current Rating : 9 A, 11 A

Withstanding Voltage : 1000 V DC

Mechanical Features

Temperature Range : -40°C to + 105°C

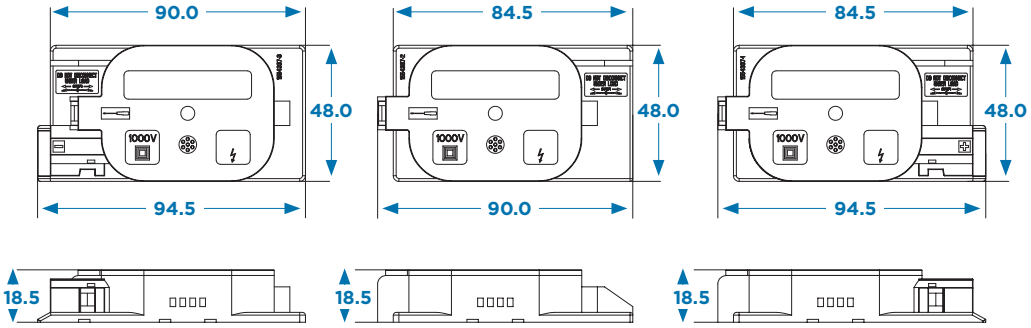
Wire Size Range : Up to 12 AWG, 4 mm^2

Protection Degree : IP 65, closed

Standards

UL approved

TÜV approved to IEC 61215 ed. 2 approved (VDE 0126-5)



Feature & Benefits

- Low profile, only 18.5 mm
- Separated diodes in separate boxes
- Proven solderless spring clip termination technique
- 2 position style for lay out flexibility
- Decentralized position saves on the length of connecting cable
- Decentralized position saves on the length of X-connect
- Connectorized style (mates with Slim Line Connector System)

Product Offering, 9 A

Part Numbers	Description
2134417-1	2 Rail Junction Box : PLUS
2134417-2	2 Rail Junction Box : CENTER
2134417-3	2 Rail Junction Box : MINUS

Product Offering, 11 A

Part Numbers	Description
1-2134417-1	2 Rail Junction Box : PLUS
1-2134417-2	2 Rail Junction Box : CENTER
1-2134417-3	2 Rail Junction Box : MINUS

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800
Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666
France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

2-Rail Micro Junction Box

Technical Data

Materials

Housing : PPE+PS,
weatherproof against UV radiation ozone, UL F1-rated

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating : Up to 7.5 A
Rated for 600 V (UL) and 1000 V (TÜV) system voltages

Mechanical Features

Temperature Range : -40°C to +85°C

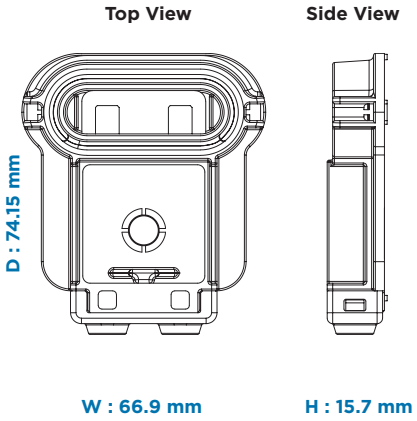
Wire Size Range : 4 mm^2, 2.5 mm^2, Dual Rated

Protection Degree : IP 67, closed

Standards

UL approved

TÜV approved to IEC 61215 ed. 2 approved



2-Rail Micro Junction Box, Part Number

Part Number	Rate Current	Rated Voltage	Cable Length (mm)	Wire Size (mm^2)	Wire Size AWG
2152131-1	7.5 A	150 V	440	4.0	12

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800

Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666

France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

1-Rail Junction Box

Technical Data

Materials

Housing : PA 66 (polyamide 66)

Cover : PPE + PS

Contact Rail: : Copper alloy

Electrical Features

Withstanding Voltage :
1000 V (TÜV), 600 V (UL)

Current Rating : Up to 25 A

Mechanical Features

Temperature Range : -40°C to +85°C

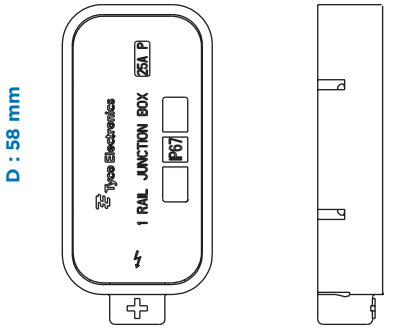
Wire Size Range : 2.5 mm² (AWG 14)
or 4.0 mm² (AWG 12)

Protection Degree : IP 20, IP 67

Standards

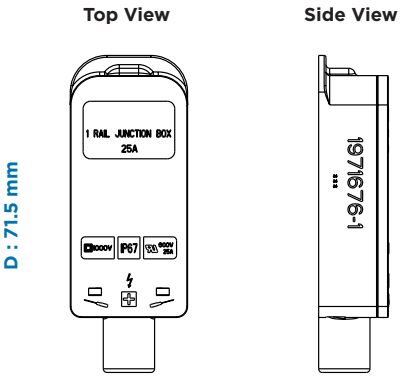
UL approved

TÜV approved to IEC 61215 ed. 2 approved



Potting Version

Part Number	Description	Cable Length (mm)	Wire Size (mm²)	AWG
1971645-1	Assembly, plus, no diode	250	4.0	12
1971645-2	Assembly, minus, no diode	250	4.0	12
1971645-3	Assembly, plus, with blocking diode	250	4.0	12



No-Potting Version

Part Number	Description	Cable Length (mm)	Wire Size (mm²)	AWG
1971676-1	Assembly, plus, no diode, 4 mm² (12 AWG)	250	4.0	12
1971676-2	Assembly, minus, no diode, 4 mm² (12 AWG)	250	4.0	12
1971676-3	Assembly, plus, with blocking diode, 4 mm² (12 AWG)	250	4.0	12

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800
Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666
France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

Building Integrated PV : Wing Edge Junction Box

Technical Data

Materials

Contact Plate : CuFe

Pin Contact : Silver plated CuSn

Housing : High temperature resin

Electrical Features

Withstanding Voltage : 1000 V DC

Mechanical Features

Temperature Range : -40°C to + 115°C

Wire Size Range : Up to 12 AWG, 4.0 mm^2

Protection Degree : IP 67

Standards

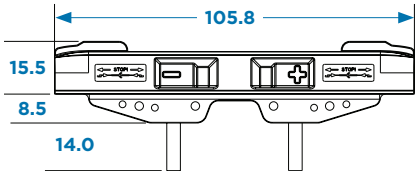
TÜV approved

Specifications

Product Specifications : 108-94114

Application Specifications: : 114-18896

Top View



Side View

Wing Edge Junction Box

Part Number	Diodes	Rated Current (IEC 61215, Edition 2) (Ampere)	Connection Type
1-1987293-4	1	12	with slim line connector system page 26 or blind cap (2120413-1)

Note: The cable assemblies for wing-edge junction box are available upon request.

NOTE : This product is not permitted for use in the USA.

Feature & Benefits

- Suitable solution for automatic lamination
- For crystalline applications
- Connectorized junction box termination allows for easy and reliable field installations
- No potting required
- No silicon glue needed

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800

Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666

France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

Building Integrated PV : Straddle Edge Junction Box

Technical Data

Materials

Housing : PPE+PS,
weatherproof against UV radiation ozone,
UV F1 rated material

Electrical Features

Rated Current : 11A (crystalline)
and 3A (thin film)

Voltage : 1000V DC

Mechanical Features

Temperature Range : -40°C to + 85°C

Protection Level : IP 67

Application Cable : 2.5 mm^2 and 4.0 mm^2

Standards

TÜV approved

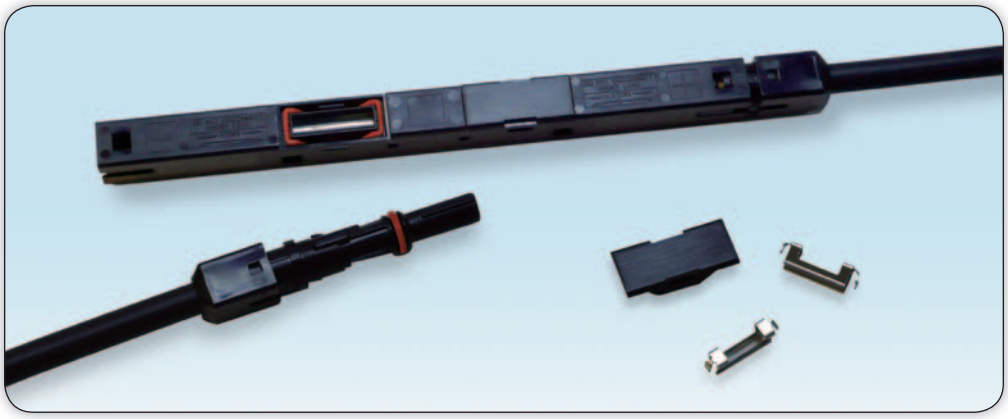
Specifications

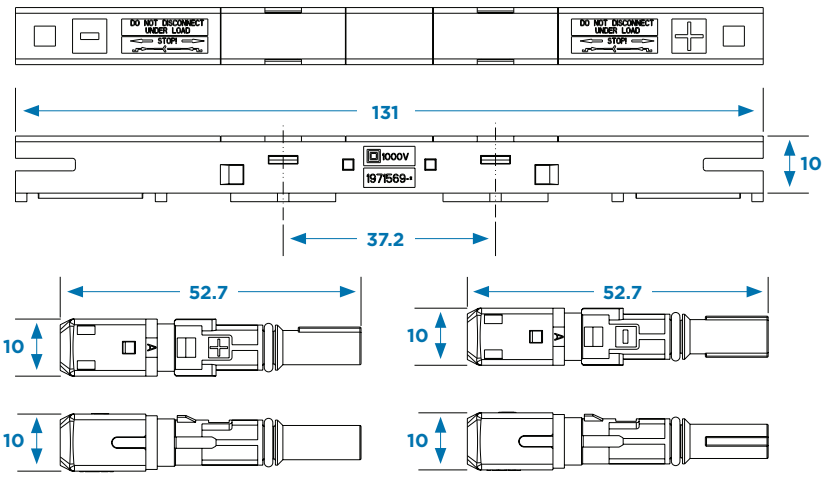
Product Specifications : 108-106018

Application Specifications: : 114-106001

Features & Benefits

- For both crystalline and thin film applications
- Lowest profile in its class, with a 10 mm width on connector and box
- Modular design can meet various size module application requirements
- Connectorized junction box termination allows for easy and reliable field installations





Straddle Edge Junction Box

Part Number	Description	Type	Termination	Diode	Rated Current (IEC 61215, ed.2) (Ampere)	Connection Type
1971569-1	Straddle Edge Junction Box	Crystalline	Potting (a)	1	11	With Socket Connector
1971569-2		Thin-film	Potting (a)	1	3	
1971569-3		Crystalline	Clamping	1	11	
1971569-4		Thin-film	Clamping	1	3	

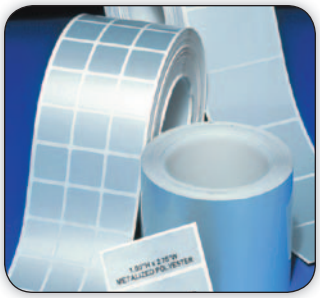
(a) Connection foil by soldering and potting. Refer to application specification for potting material information.
Note: The cable assemblies for straddle edge junction boxes are available upon request

Socket Connector & Accessories

Part Number	Description	Keying	Cable Outer Diameter	Wire Type
1971131-1	Socket Connector	Plus	6.1 - 6.5 mm	See Application Specification
1971131-2	Socket Connector	Minus	6.1 - 6.5 mm	See Application Specification
1971131-3	Socket Connector	Plus	5.8 - 6.1 mm	See Application Specification
1971131-4	Socket Connector	Minus	5.8 - 6.1 mm	See Application Specification
1971133-1	End Cap	–	–	–
1971638-1	Dust Cap	–	–	–

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800
Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666
France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

HM : High tack metallized polyester labels
(for indoor and outdoor applications)



HM is a thermal transfer printable metalized polyester film with a high tack permanent acrylic adhesive. The labels are designed for application to rough surfaces or where increased adhesion is required. The high tack adhesion of HM will bond to most demanding surfaces, including textured and contoured surfaces.

Product Order	Pack. Qty.	# AC	Label Width		Label Height		Horizontal Repeat		Vertical Repeat		Web Width	
			(mm)	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)	(inches)
HM-064064-25-8A	25000	12	6.4	0.25	6.4	0.25	6.4	0.25	9.5	0.375	82.2	3.24
HM-089047-10-8A	10000	5	8.9	0.35	4.7	0.186	11.4	0.45	7.9	0.313	60.6	2.386
HM-095080-25-8A	25000	5	9.5	0.375	8	0.315	12.2	0.48	12.7	0.5	64.3	2.531
HM-095095-10-8A	10000	7	9.5	0.375	9.5	0.375	11.1	0.437	12.7	0.5	82.1	3.23
HM-127111-10-8A	10000	5	12.7	0.5	11.1	0.437	16.8	0.662	14.3	0.563	86	3.38
HM-127127-10-8A	10000	5	12.7	0.5	12.7	0.5	15.9	0.625	15.9	0.625	82.6	3.25
HM-191064-10-8A	10000	4	19.1	0.75	6.4	0.25	21.6	0.85	9.5	0.375	89.9	3.54
HM-191114-15-8A	15000	3	19.1	0.75	11.4	0.45	22.2	0.875	14.7	0.579	69.5	2.736
HM-254064-10-8A	10000	3	25.4	1	6.4	0.25	27.9	1.1	9.5	0.375	87.3	3.436
HM-254127-10-8A	10000	3	25.4	1	12.7	0.5	27.9	1.1	16.9	0.666	87.4	3.44
HM-254254-10-8A	10000	3	25.4	1	25.4	1	27.9	1.1	28.6	1.125	87.4	3.44
HM-318097-10-8A	10000	1	31.8	1.25	9.7	0.38	--	--	12.7	0.5	37.8	1.488
HM-381064-10-8A	10000	1	38.1	1.5	6.4	0.25	--	--	9.5	0.375	44.5	1.75
HM-381127-5-8A	5000	2	38.1	1.5	12.7	0.5	44.2	1.738	15.9	0.625	88.2	3.472
HM-381191-5-8A	5000	2	38.1	1.5	19.1	0.75	43.2	1.7	22.2	0.875	87.6	3.45
HM-381381-2.5-8A	2500	2	38.1	1.5	38.1	1.5	44.5	1.75	40.8	1.607	88.9	3.5
HM-381635-5-8A	5000	2	38.1	1.5	63.5	2.5	40.6	1.6	66.7	2.625	84.7	3.338
HM-445064-10-8A	10000	1	44.5	1.75	6.4	0.25	--	--	9.5	0.375	50.4	1.986
HM-445445-2-8A	2000	1	44.5	1.75	44.5	1.75	--	--	47.6	1.875	50.4	1.986
HM-508064-10-8A	10000	1	50.8	2	6.4	0.25	--	--	9.5	0.375	56.9	2.24
HM-508127-5-8A	5000	1	50.8	2	12.7	0.5	--	--	15.9	0.625	56.9	2.24
HM-508254-5-8A	5000	1	50.8	2	25.4	1	--	--	28.6	1.125	57.2	2.25
HM-508318-2.5-8A	2500	1	50.8	2	31.8	1.25	--	--	34.9	1.375	56.9	2.24
HM-508508-3-8A	3000	1	50.8	2	50.8	2	--	--	54.6	2.15	54	2.13
HM-762381-2.5-8A	2500	1	76.2	3	38.1	1.5	--	--	41.3	1.625	82.3	3.24
HM-762508-2.5-8A	2500	1	76.2	3	50.8	2	--	--	54	2.125	82.6	3.24
HM-101508-2.5-8A	2500	1	101.6	4	50.8	2	--	--	54.6	2.15	104.1	4.1
HM-101635-2.5-8A	2500	1	101.6	4	63.5	2.5	--	--	66.7	2.625	107.7	4.24
HM-101101-1.3-8A	1300	1	101.6	4	101.6	4	--	--	104.8	4.125	104.1	4.1

Part Number Example

HM - 127508 - 10 - 8A

- **Metallized**
- **Pack Size**
- **Label Height (mm)**
- **Label Width (mm)**
- **Product Family**

Technical Data

Applications

- Racks and Panels (including back of solar panels)
- Electronic device and equipment labeling
- General purpose label applications

Temperature Range

Operating Temperature
: –40°C to +150°C (–40°F to +302°F)

Minimum Application Temperature
: 10°C (50°F)

Specifications and Certifications

TE Technical Data Sheet
: TTDS-075
: UL 969, File MH17292

Printer Information

TE Printer
: TE3124 (Thermal transfer)
: T312 (Thermal transfer)

TE Ribbons
: 1330-0607

NOTE : For reliable print performance and durability, use with Tyco Electronics 1330-0607 series ribbon.

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800

Latin/S. America: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666

France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

HW : High Tack White Polyester Labels

HW is a white thermal transfer printable polyester film with a high tack - permanent acrylic adhesive,designed for application to multiple surface types where increased adhesion is required. The high tack adhesion of HW will bond to most demanding surfaces, including textured and contoured surfaces.

Product Order	Pack. Qty.	# AC	Label Width		Label Height		Horizontal Repeat		Vertical Repeat		Web Width	
			(mm)	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)	(inches)	(mm)	(inches)
HW-064064-25-9	25000	12	6.4	0.250	6.4	0.250	6.4	0.25	9.5	0.375	82.2	3.240
HW-080080-10-9	10000	8	8.0	0.315	8.0	0.315	9.9	0.39	13.3	0.525	83.3	3.280
HW-089047-10-9	10000	5	8.9	0.350	4.7	0.185	11.4	0.45	7.9	0.313	60.6	2.386
HW-095095-10-9	10000	7	9.5	0.375	9.5	0.375	11.1	0.437	12.7	0.500	64.3	2.531
HW-114040-25-9	25000	6	11.4	0.450	4.0	0.158	11.4	0.45	7.1	0.282	74.6	2.936
HW-127032-10-9	10000	5	12.7	0.500	3.2	0.126	19.1	0.75	6.4	0.250	94.6	3.736
HW-127064-10-9	10000	6	12.7	0.500	6.4	0.252	15.2	0.6	9.5	0.375	95.3	3.750
HW-127111-10-9	10000	5	12.7	0.500	11.1	0.437	16.8	0.662	14.3	0.563	86.0	3.380
HW-127127-10-9	10000	5	12.7	0.500	12.7	0.500	15.9	0.625	15.9	0.625	82.6	3.250
HW-165051-25-9	25000	4	16.5	0.650	5.1	0.200	17.8	0.7	8.3	0.325	75.8	2.990
HW-171171-10-9	10000	5	17.1	0.674	17.1	0.674	19.7	0.774	20.3	0.800	101.8	4.006
HW-178095-10-9	10000	4	17.8	0.700	9.5	0.375	19.1	0.75	12.7	0.500	80.9	3.190
HW-191064-10-6	10000	4	19.1	0.750	6.4	0.250	21.6	0.85	9.5	0.375	89.9	3.540
HW-191064-10-9	10000	4	19.1	0.750	6.4	0.250	21.6	0.85	9.5	0.375	89.9	3.540
HW-203127-10-9	10000	4	20.3	0.800	12.7	0.500	22.9	0.9	15.9	0.625	94.6	3.730
HW-229064-10-9	10000	3	22.9	0.900	6.4	0.250	28.6	1.125	9.5	0.375	86.0	3.390
HW-254064-10-9	10000	3	25.4	1.000	6.4	0.250	27.9	1.1	9.5	0.375	95.3	3.750
HW-254097-10-9	10000	3	25.4	1.000	9.7	0.380	27.9	1.1	12.7	0.500	87.4	3.440
HW-254127-10-4	10000	3	25.4	1.000	12.7	0.500	27.9	1.1	16.9	0.666	87.4	3.440
HW-254254-10-9	10000	3	25.4	1.000	25.4	1.000	27.9	1.1	28.6	1.125	87.4	3.440
HW-318064-10-9	10000	1	31.8	1.250	6.4	0.250	--	--	9.5	0.375	37.9	1.490
HW-318097-10-9	10000	1	31.8	1.250	9.7	0.380	--	-	12.7	0.500	37.9	1.490
HW-381064-10-9	10000	1	38.1	1.500	6.4	0.250	--	--	9.5	0.375	44.5	1.750
HW-381127-5-9	5000	2	38.1	1.500	12.7	0.500	44.2	1.74	15.9	0.625	88.2	3.470
HW-381191-5-9	5000	2	38.1	1.500	19.1	0.750	43.2	1.7	22.2	0.875	87.6	3.450
HW-445102-5-9	5000	1	44.5	1.750	10.2	0.400	--	--	12.7	0.500	50.4	1.986
HW-478175-5-9	5000	1	47.8	1.880	17.5	0.690	--	--	24.4	0.962	66.0	2.600
HW-508064-10-9	10000	1	50.8	2.000	6.4	0.250	--	--	9.5	0.375	56.9	2.240
HW-508095-5-9	5000	1	50.8	2.000	9.5	0.375	--	--	12.7	0.500	57.2	2.250
HW-508127-5-9	5000	1	50.8	2.000	12.7	0.500	--	--	15.9	0.625	56.9	2.240
HW-508254-5-9	5000	1	50.8	2.000	25.4	1.000	--	--	28.6	1.125	57.2	2.250
HW-508318-2.5-9	2500	1	50.8	2.000	31.8	1.250	--	--	34.9	1.375	56.9	2.240
HW-523841-1.5-9	1500	1	52.3	2.060	84.1	3.310	--	--	88.9	3.500	58.2	2.290
HW-699191-5-9	5000	1	69.9	2.750	19.1	0.750	--	--	23.3	0.917	76.2	3.000
HW-699254-5-9	5000	1	69.9	2.750	25.4	1.000	--	--	28.6	1.125	76.2	3.000
HW-762127-1-9	1000	1	76.2	3.000	127.0	5.000	--	--	129.5	5.100	79.4	3.130
HW-762254-5-9	5000	1	76.2	3.000	25.4	1.000	--	--	28.6	1.125	82.3	3.240
HW-762508-2.5-9	2500	1	76.2	3.000	50.8	2.000	--	--	54.0	2.125	82.6	3.240

Technical Data

Applications

- Enclosures, Racks and Panels (including back of solar panels)
- Electronic device and equipment labeling
- General purpose label applications

Temperature Range

Operating Temperature
: –40°C to +150°C (–40°F to +302°F)

Minimum Application Temperature
: 10°C (50°F)

Specifications and Certifications

TE Technical Data Sheet
: TTDS-076
: UL 969, File MH17292

Printer Information

TE Printer
: TE3124 (Thermal transfer)
: T312 (Thermal transfer)

TE Ribbons
: 1330-0607

NOTE : For reliable print performance and durability, use with Tyco Electronics 1330-0607 series ribbon.

Part Number Example

HW - 127508 - 10 - 9

- **White**
- **Pack Size**
- **Label Height (mm)**
- **Label Width (mm)**
- **Product Family**

Note : Label can be flood-coated to meet any color in the PMS book. Inquire with TE customer service.

USA: 1-800-522-6752
Canada: +1-905-475-6222
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France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

Grounding System : Grounding Bolt

Technical Data

Materials

Connector & Hardware
: Stainless Steel (Passivated)

Electrical Features

Short Term Current Test (UL 467)
: 6 AWG = 1530A (6 seconds)
: 8 AWG = 1180A (4 seconds)
: 10 AWG = 750A (4 seconds)
: 12 AWG = 470A (4 seconds)

Mechanical Features

Securness Test (ul 486A-B)
: 6 AWG = 18lbs (30 minutes)
: 8 AWG = 8lbs (30 minutes)
: 10 AWG = 5lbs (30 minutes)
: 12 AWG = 5lbs (30 minutes)

Pull out Test (ul 486A-B)
: 6 AWG = 100lbs (1 minute)
: 8 AWG = 90lbs (1 minute)
: 10 AWG = 80lbs (1 minute)
: 12 AWG = 70lbs (1 minute)

Application Tooling

Flex socket wrench or wrenches

Standards

UI 467 listed

UL File #E69905

A requirement for UL 1703 solar panel listing

CSA C22.2 No. 41-07

Features & Benefits

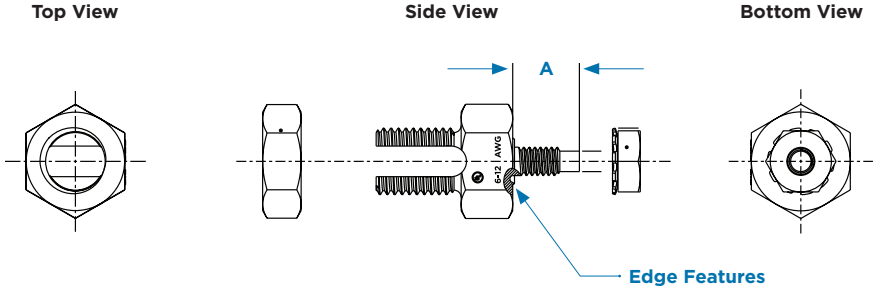
- Rugged and compact hex bolt design made from stainless steel.
- Quick and easy mounting procedures.
- Bottom edge feature cuts through the annodized aluminum surface when securing the hex bolt to the module frame.
- Standard tooling can be used with the hex nuts.

Product Offering

Part Number	Description	Thread	Dim "A"	Package Quantity
2058729-1	6-12 AWG	#8-32 UNC	.380	500
2106831-1	Long Shank 6-12 AWG	#10-32 UNF	.700	100

*Instruction Sheet : 408-10262

Dimensions



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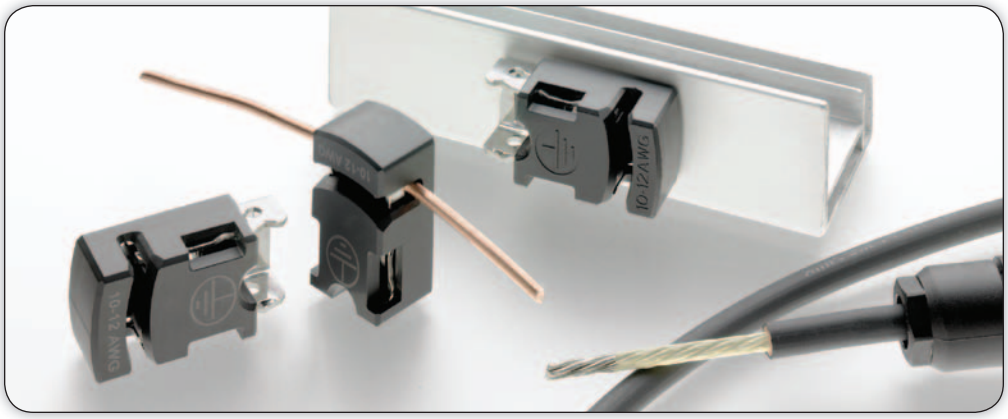
Grounding System : Grounding Clip



Technical Data

Materials

Housing : Durable PBT 30% glass filled polyester. Material is outdoor & UV rated
Contact : High conductivity, copper

Electrical Features

Meets the tough requirements of photovoltaic grounding applications and the 2008 National Electrical Code.

Mechanical Features

Meets the tough requirements for grounding applications for solid copper wire.
12 AWG applications will withstand 70lbs pull while the 10 AWG applications will withstand 80lbs pull

Application Tooling

No special tooling is required -- only flathead screwdrivers and channel lock pliers (optional)

Standards

UI 467 listed

UL File #E69905

A requirement for UL 1703 solar panel listing

CSA C22.2 No. 41-07

Features & Benefits

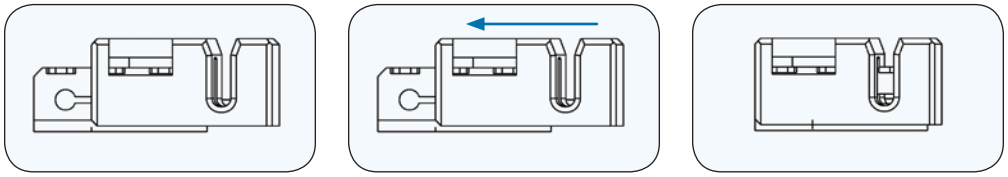
- Product comes as an assembled kit that includes an attachment screw
- Contact design provides 4 points of contact to the ground wire for high reliability
- Product is easy to install with simple tools that are readily available
- Removal of the installed ground wire requires a screwdriver, this meeting the tooled extration requirements
- RoHS compliant

Product Offering

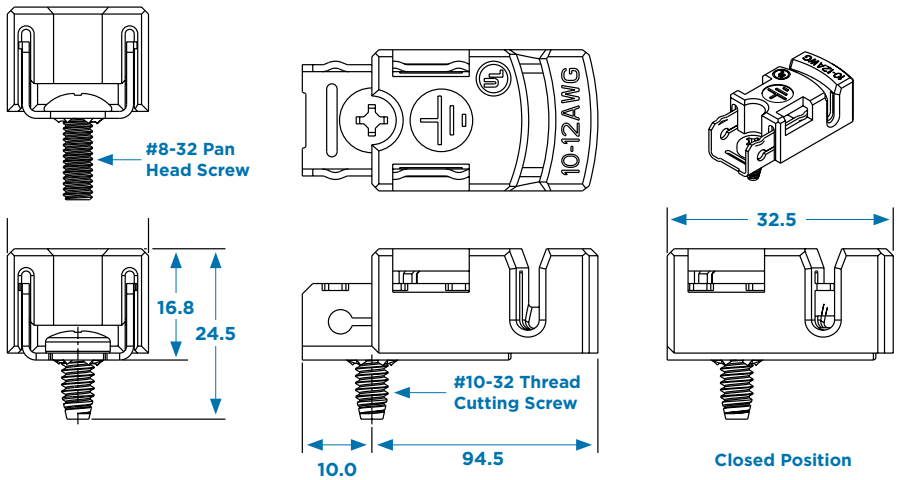
Part Number	Screw	Nut	Package Quantity	Wire Size
1954381-1	#10-32 Thread Cutting	None	100	10-12 AWG
1954381-2	#8-32 Pan Head	#8-32	100	10-12 AWG
1954381-3	#8-32 Pan Head	#8-32 Star Washer Nut	100	10-12 AWG
1954381-4	#8-32 Long Shark	none	100	10-12 AWG
1954381-5	#10-32 Thread Cutting	none	100	6 mm²

*Instruction Sheet : 408-10160, Product Specifications: 108-2312

3 Easy Steps to Ground Your PV System



Dimensions



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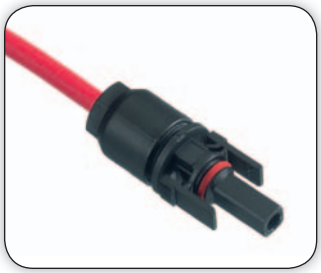
Cable Coupler : Standard Line



Technical Data

Electrical Features
Current Rating : 25 A
Withstanding Voltage : 1000 V DC
Contact Resistance : 1 mΩ typical

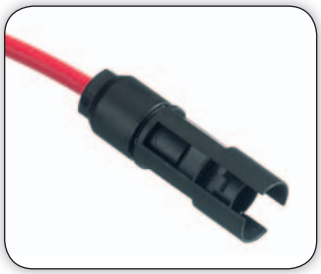
Mechanical Features
Temperature Range : -40°C to + 115°C
Dimensions : Diameter 18 mm (.71 inch)
Protection Degree : IP 67, mated
Contact Finish : Silver plated

Standards
UL approved
TÜV approved

Female Cable Coupler (kit with screw-machined contact)

Gen 3 Seal Part Number	Gen 2 Seal Part Number				
Cable Outer Diameter 6.0 mm to 8.0 mm	Cable Outer Diameter 4.5 mm to 6.0 mm	Wire Size mm²	Wire Size AWG	Keying	Package Quantity
1394462-1	4-1394462-6	2.5	14	Plus	100
1394462-3	4-1394462-8	4.0	12	Plus	100
5-1394462-5	6-1394462-3	6.0	10	Plus	100
1394462-2	4-1394462-7	2.5	14	Minus	100
1394462-4	4-1394462-9	4.0	12	Minus	100
5-1394462-6	6-1394462-4	6.0	10	Minus	100

Specifications
Application Specification : 114-18488
Installation Manual : 1654276-1 (Europe), 2-1773458-2 (US)



Technical Data

Electrical Features
Current Rating : 25 A
Withstanding Voltage : 1000 V DC
Contact Resistance : 1 mΩ typical

Mechanical Features
Temperature Range : -40°C to + 115°C
Dimensions : Diameter 18 mm (.71 inch)
Protection Degree : IP 67, mated
Contact Finish : Silver plated

Standards
UL approved
TÜV approved

Male Cable Coupler (kit with screw-machined contact)

Gen 3 Seal Part Number	Gen 2 Seal Part Number				
Cable Outer Diameter 6.0 mm to 8.0 mm	Cable Outer Diameter 4.5 mm to 6.0 mm	Wire Size mm²	Wire Size AWG	Keying	Package Quantity
1394461-1	1394461-7	2.5	14	Plus	100
1394461-3	7-1394461-0	4.0	12	Plus	100
6-1394461-5	7-1394461-3	6.0	10	Plus	100
1394461-2	1394461-8	2.5	14	Minus	100
1394461-4	7-1394461-1	4.0	12	Minus	100
6-1394461-6	7-1394461-4	6.0	10	Minus	100
6-1394461-1	6-1394461-3	2.5	14	Neutral	100
6-1394461-2	7-1394461-2	4.0	12	Neutral	100
6-1394461-4	7-1394461-5	6.0	10	Neutral	100

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China: +86 (0) 400-820-6015

Cable Coupler : Slim Line

Technical Data

Electrical Features
Current Rating : 25 A
Withstanding Voltage : 1000 V DC
Contact Resistance : 1 mΩ typical

Mechanical Features
Temperature Range : -40°C to + 115°C
Dimensions : Diameter 12.5 mm (.49 inch)
Protection Degree : IP 67, mated
Contact Finish : Silver plated

Standards
UL approved
TÜV approved

Female Cable Coupler (kit with screw-machined contact)

Part Number	Wire Size mm²	Wire Size AWG	Keying	Cable Outer Diameter	Package Quantity	Standard
1987559-1	2.5	14	Plus	> 6.3 to 6.8 mm	100	TÜV & UL
1987559-2	2.5	14	Minus	> 6.3 to 6.8 mm	100	TÜV & UL
1-1987559-1	4.0	12	Plus	5.8 to 6.3 mm	100	TÜV & UL
1-1987559-2	4.0	12	Minus	5.8 to 6.3 mm	100	TÜV & UL

Female Cable Coupler (without contact : only housing and sealing)

Part Number	Keying	Cable Outer Diameter	Package Quantity	Standard
1987287-1	Plus	> 6.3 to 6.8 mm	100	TÜV & UL
1987287-2	Minus	> 6.3 to 6.8 mm	100	TÜV & UL
2120347-1	Plus	5.8 to 6.3 mm	100	TÜV & UL
2120347-2	Minus	5.8 to 6.3 mm	100	TÜV & UL

Specifications
Product Specification : 108-94205-1
Application Specification : 114-18952-1

Technical Data

Electrical Features
Current Rating : 25 A
Withstanding Voltage : 1000 V DC
Contact Resistance : 1 mΩ typical

Mechanical Features
Temperature Range : -40°C to + 115°C
Dimensions : Diameter 12.5 mm (.49 inch)
Protection Degree : IP 67, mated
Contact Finish : Silver plated

Standards
UL approved
TÜV approved

Male Cable Coupler (kit with screw-machined contact)

Part Number	Wire Size mm²	Wire Size AWG	Keying	Cable Outer Diameter	Package Quantity	Standard
1987558-1/-4	2.5	14	Plus	> 6.3 to 6.8 mm	100	TÜV/UL
1987558-2/-5	2.5	14	Minus	> 6.3 to 6.8 mm	100	TÜV/UL
1987558-3/-6	2.5	14	Neutral	> 6.3 to 6.8 mm	100	TÜV/UL
1-1987558-1/-4	4.0	12	Plus	5.8 to 6.3 mm	100	TÜV/UL
1-1987558-2/-5	4.0	12	Minus	5.8 to 6.3 mm	100	TÜV/UL
1-1987558-3/-6	4.0	12	Neutral	5.8 to 6.3 mm	100	TÜV/UL

Male Cable Coupler (without contact : only housing and sealing)

Part Number	Keying	Cable Outer Diameter	Package Quantity	Standard
1987286-1/-4	Plus	> 6.3 to 6.8 mm	100	TÜV/UL
1987286-2/-5	Minus	> 6.3 to 6.8 mm	100	TÜV/UL
1987286-3/-6	Neutral	> 6.3 to 6.8 mm	100	TÜV/UL
2120346-1/-4	Plus	5.8 to 6.3 mm	100	TÜV/UL
2120346-2/-5	Minus	5.8 to 6.3 mm	100	TÜV/UL
2120346-3/-6	Neutral	5.8 to 6.3 mm	100	TÜV/UL

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Replacement Contacts

Technical Data

Materials

Contact : Silver plated, copper alloy

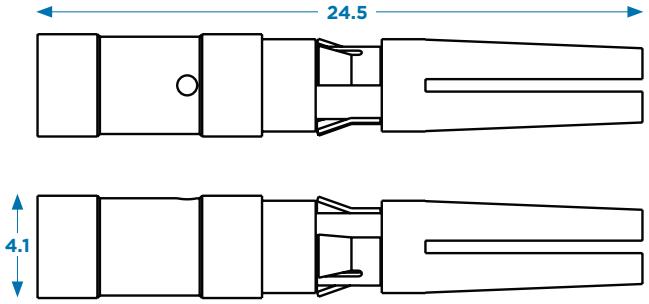
Electrical Features

Current Rating
: Up to 25 A

Female Contacts (Screw-Machined)

Material : Copper alloy, silver plated

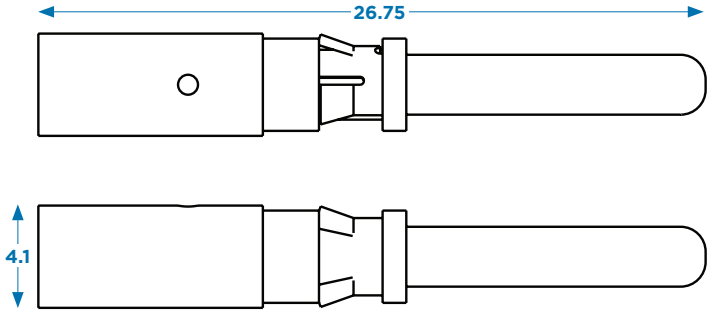
Part Number	Wire Size (mm²)	Wire Size (AWG)	Package Quantity
1987281-1	2.5	AWG 14	100
1987281-2	4.0	AWG 12	100
1987281-3	6.0	AWG 10	100



Male Contacts (Screw-Machined)

Material : Copper alloy, silver plated

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



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PV4 Connector

Technical Data

Materials

Housing : PC

Contact : Tin copper

Contact Finish : Tin plated

Electrical Features

Withstanding Voltage : 1000 V DC

Current Rating :
Up to 35 A for 4.0 mm²
Up to 40 A for 6.0 mm²

Contact Resistance : 0.25 mΩ typical

Mechanical Features

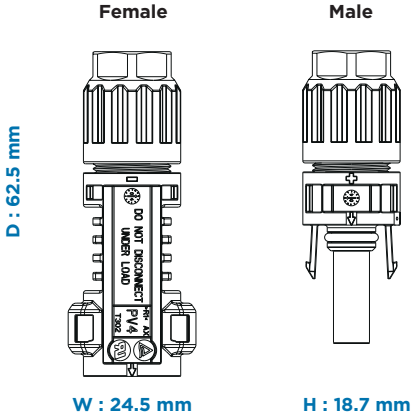
Dimensions : Diameter 18.7 mm (.74 inch)

Protection Degree : IP 68, mated

Standards

UL pending

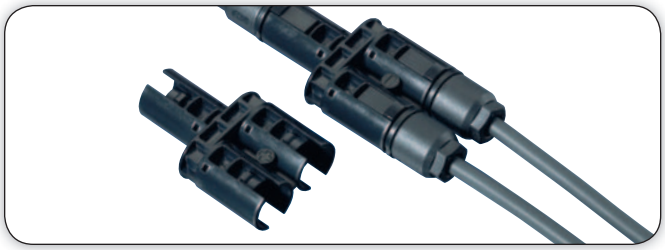
TÜV pending

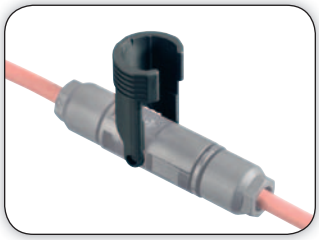


Cable Coupler : PV4 (Female and Male Cable Coupler)

Gen 4 Seal P/N Cable Outer Diameter 6.0 mm to 8.0 mm	Gen 2 Seal P/N Cable Outer Diameter 4.5 mm to 6.0 mm	Wire Size mm²	Wire Size AWG	Coupler	Package Quantity
1971861-1	1971861-2	4.0; 6.0	12; 10	Male	100
1971862-1	1971862-2	4.0; 6.0	12; 10	Female	100

Accessories

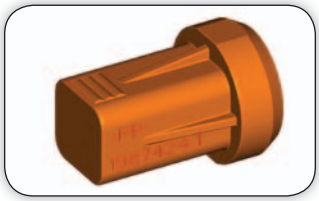




Female Housing : with strap

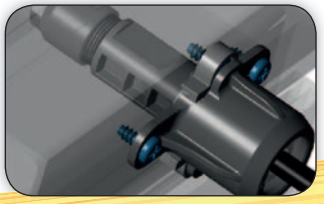
Female Housing : no strap

Male Housing : with strap



Male Housing : no strap

Frame Mount 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

Safety Clips (Optional)

Part Number	Description	Package Quantity
1534226-1	Pivoted	100
2106207-1*	NEC 2008/USA UTE C15-712/ France	100

*Instruction Sheet : 408-10296

Connector Dust Covers

Part Number	Description	Package Quantity
1987423-1	Female housing cover with strap	100
1394739-1	Male housing cover with strap	100
1987424-1	Female housing no strap	100
1987419-1	Male housing no strap	100

Note : Dust cap are reusable

Frame Mount Connector

Part Number	Description	Wire Size	Rated Current	Standard
1971635-1	Frame Mount Connector	2.5 - 4.0 mm^2	12 A	TÜV (UL with cover)
1971653-1	Cover (for UL approval)			

Product spec.: 108-106054, Application spec.: 114-106009

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DC Converter Receptacle

Technical Data

Electrical Features

Current Rating : Up to 25 A

Withstanding Voltage : 1000 V DC

Contact Resistance : 1 mΩ typical

Mechanical Features

Dimensions : Diameter 18 mm (.71 inch)

Temperature Range : -40°C to +105°C

Protection Degree : IP 67, mated

Contact Finish : Silver plated

Standards

TÜV approved

UL Listed

With O-Ring and Metal Nut
(kit with screw-machined contact)

Part Number	Wire Size mm2	Wire Size AWG	Keying	Package Quantity	Standard
1394738-1	2.5	14	Plus	100	TÜV
1394738-3	4.0	12	Plus	100	TÜV
1394738-9	6.0	10	Plus	100	TÜV
1394738-2	2.5	14	Minus	100	TÜV
1394738-4	4.0	12	Minus	100	TÜV
1-1394738-0	6.0	10	Minus	100	TÜV
2120382-1	2.5	14	Plus	100	UL
2120382-3	4	12	Plus	100	UL
2120382-5	6	10	Plus	100	UL
2120382-2	2.5	14	Minus	100	UL
2120382-4	4	12	Minus	100	UL
2120382-6	6	10	Minus	100	UL

With Flat Seal and Plastic Nut
(kit with screw-machined contact)

Part Number	Wire Size mm2	Wire Size AWG	Keying	Flat Seal Color	Package Quantity	Standard
1740210-1	2.5	14	Plus	Black	100	TÜV
1740210-3	4.0	12	Plus	Black	100	TÜV
1740210-5	6.0	10	Plus	Black	100	TÜV
1740210-2	2.5	14	Minus	Black	100	TÜV
1740210-4	4.0	12	Minus	Black	100	TÜV
1740210-6	6.0	10	Minus	Black	100	TÜV
1740210-7	2.5	14	Plus	Red	100	TÜV
1740210-9	4.0	12	Plus	Red	100	TÜV
1-1740210-1	6.0	10	Plus	Red	100	TÜV
1740210-8	2.5	14	Minus	Blue	100	TÜV
1-1740210-0	4.0	12	Minus	Blue	100	TÜV
1-1740210-2	6.0	10	Minus	Blue	100	TÜV

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Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

Solar Cable : Global TÜV and UL 4703

Technical Data

Material

Conductor : Stranded tin plated copper

Insulation : Electron beam cross-linked polyolefin

Sheath : Electron beam cross-linked halogen free polyolefin

Color : Black (Blue/Red upon request)

Electrical Features

Voltage Rating
(as per TÜV requirement
600/1000 VAC, 1800 V DC)
: 1800/3000 VAC
: 2600 VDC

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

Standards

TÜV certified according to 2PfG 1169/08.2007 (PV1-F) : RG0021060

UL certified according to UL Outline 4703 (PV wire, type ZKLA) : E317230

Fire Performance : IEC 60332-1-2, UL 1581 1080/VW1, EN 50267-2-1/2, EN 50305

Conductor : IEC 60228 class 5 (stranded and flexible tin plated copper wire)

Features & Benefits

- More than 50 years of expected lifetime (acc. to TUV 2PfG1169/08.2007)
- More than 50% higher insulation resistance provides a superior safety
- Can withstand the lowest temperature in its range (-60°C at fixed installation)
- Temperature Rating : –40°C up to +125°C
- TÜV and UL approved
- Dual wall insulation
- Excellent resistance to abrasion
- Excellent flexibility and stripping performance

As part of expanding the SOLARLOK product line, Tyco Electronics produces wire that is designed to meet the harsh environmental conditions typical of photovoltaic installations. The flexible, dual wall, halogen free and cross linked solar wire offers long term stability with TÜV UL approval. Its outstanding features include: high resistance against environmental conditions such as humidity, UV-radiation and ozone. In addition, it has excellent resistance to abrasion and temperature extremes. The wire has a high dielectric withstanding voltage and due to its fine-stranded, tin plated copper conductor, it is easy to handle, bend, route, and to strip.

Global TÜV and UL 4703

Color	Part Number	Cross Section		Conductor		Diameter (mm)	Weight (kg/km)	Reel Package (m)
		mm²	AWG	Construction no. x mm	Max Diameter (mm)			
Black	**956297-4**	2.5	14	50 x 0,26	1.95	6,65 +0,15/-0,1	62.5	500
	956298-4	4.0	12	56 x 0,31	2.50	6,90 +/-0,10	75.8	500
	956299-4	6.0	10	84 x 0,31	3.05	7,35 +0,3/-0,25	95.5	500
	1-956297-4	2.5	14	50 x 0,26	1.95	6,65 +0,15/-0,1	62.5	100
	1-956298-4	4.0	12	56 x 0,31	2.50	6,90 +/-0,10	75.8	100
	1-956299-4	6.0	10	84 x 0,31	3.05	7,35 +0,3/-0,25	95.5	100

TÜV approved cable upon request

USA: 1-800-522-6752
Canada: +1-905-475-6222
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France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015

Solar Cable : Type USE-2

Technical Data

Electrical Features

Voltage Rating : 600 V DC

Mechanical Features

Operating Temperature : up to +90°C

Standards

UL certified to 854 (USE-2) : 12-10 AWG

UL File E314122 and E314123

Features & Benefits

- Insulation provides resistance to U.V., water, ozone, fluids, salt, gasoline, and petroleum general weathering
- High strand count conductor provides flexibility and stripping performanc
- Multiple cable diameters available

USE-2 approved solar cable – for the North American market UL approved cable is offered in 10 through 14 AWG. This cable is approved for USE-2, XHHW-2, RHW-2, or RHH. Sunlight, gasoline, and petroleum resistance make this an ideal cable for any solar installation in North America. A high strand count increases the flexibility and tinned copper wire strands ease the use of this cable.

Type USE-2 (For US Installation), UL Approved Cable

Color	Part Number	Cross Section AWG	Diameter (inch)	Reel Package (ft)
Black	1986166-2	14	0.17	500
	1986166-3	14	0.17	2,500
	1986165-2	12	0.19	500
	1986165-3	12	0.19	2,500
	1986164-2	10	0.21	500
	1986164-3	10	0.21	2,500

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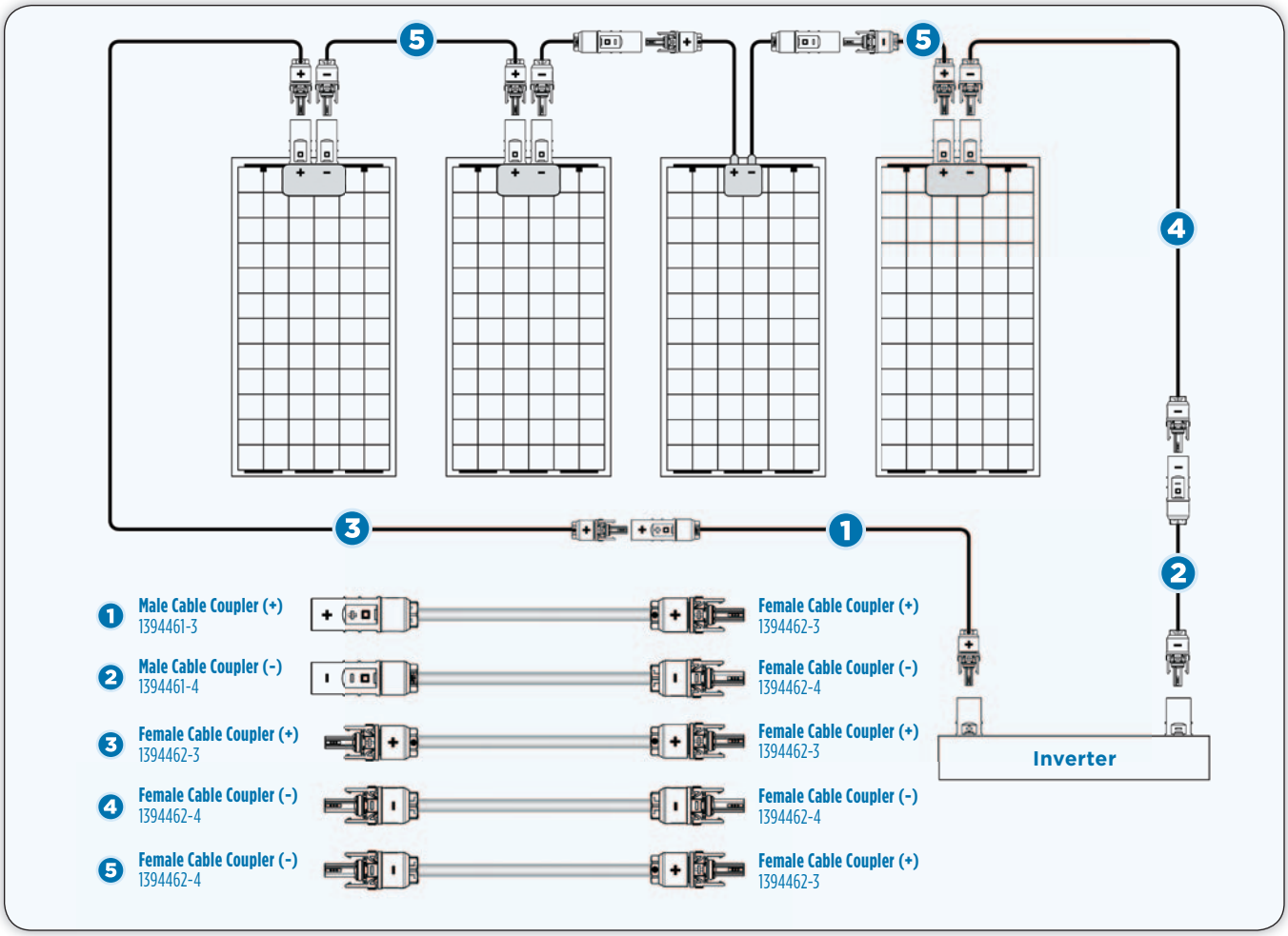
Wiring Example with Extension Cables



Configuration Example at 4.0 mm²

Cable Assembly

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

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

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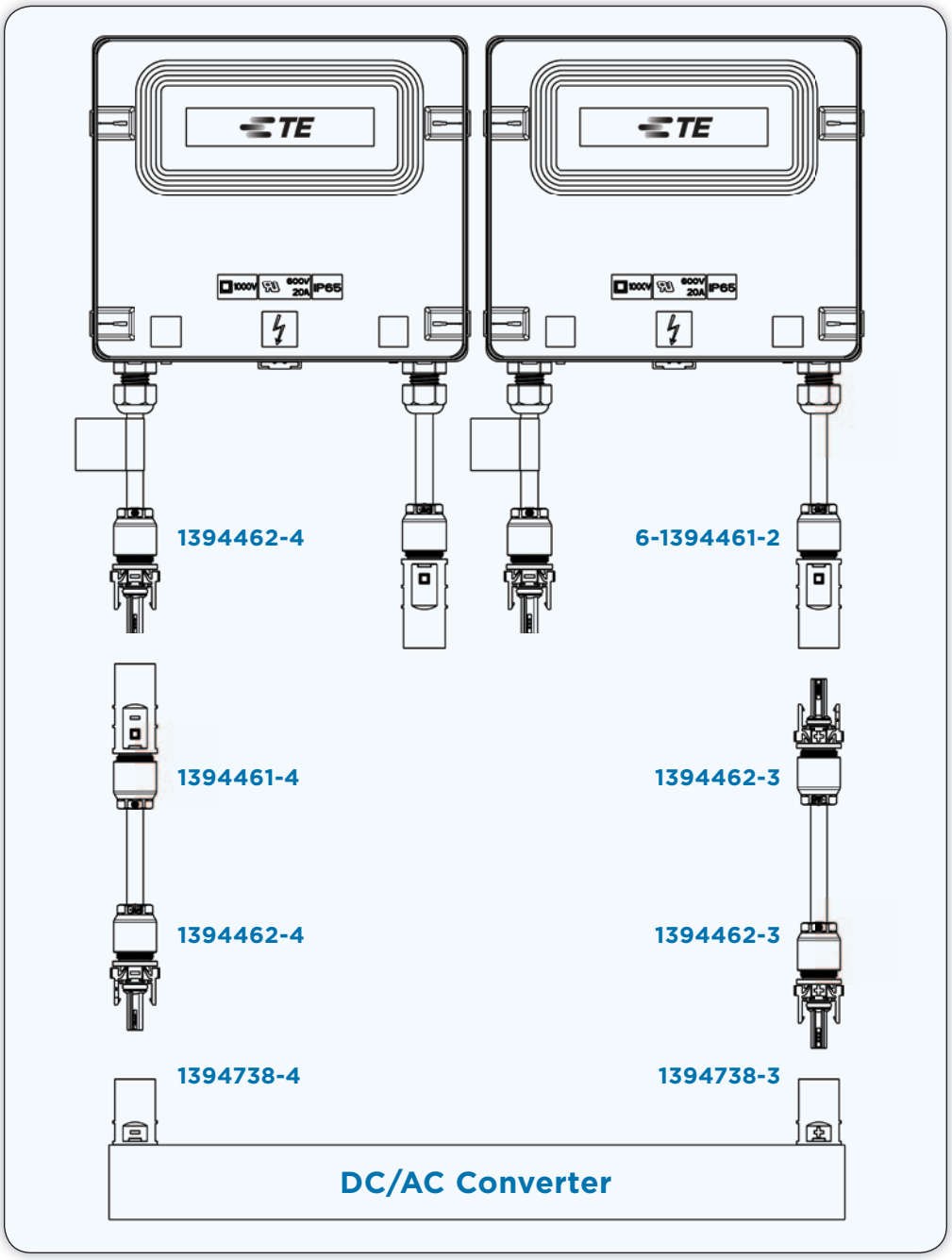
Interconnection Examples

Serial Interconnection for Junction Boxes with Cable Outlet
(4.0 mm² / 12 AWG Wiring, Cable Outer Diameter 5.5 – 8.0 mm)



Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are standard equivalents. Dimensions are shown for reference purposes only. Specifications subject to change.

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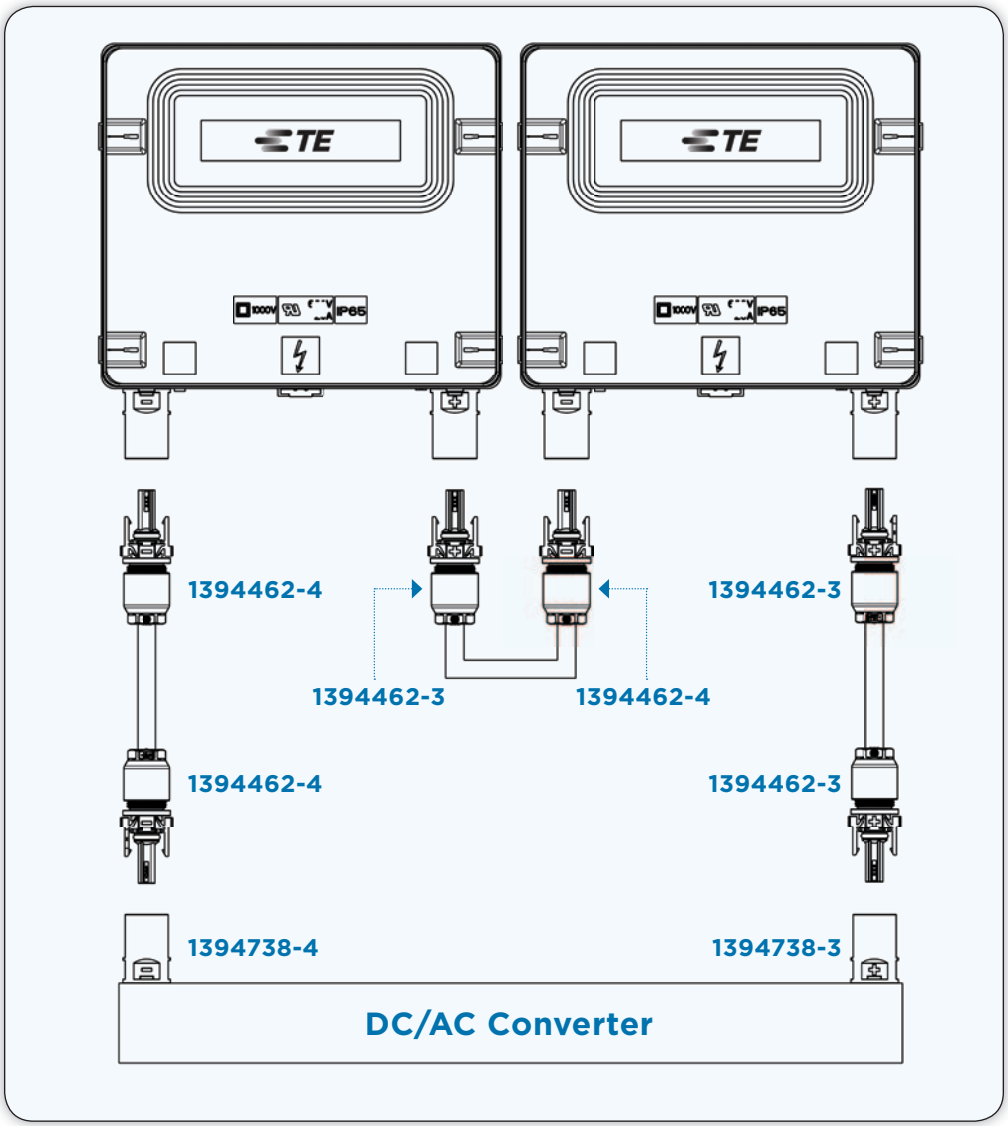
Interconnection Examples (continued)

Serial Interconnection for Junction Boxes with Plug Connectors
(4.0 mm² / 12 AWG Wiring, Cable Outer Diameter 5.5 – 8.0 mm)



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5-String Combiner Box

Technical Data

Output Wire : Cu ONLY, 90°C, 14-4 AWG

Maximum Voltage : 600 V

Maximum Output Current : 75 A

Maximum Continuous Current : 60 A

Maximum Current Per String : 15 A

Maximum Fuse Rating : 15 A

Maximum Module Isc Per String : 9.6 A

Enclosure Type : NEMA 3

Ambient Temperature
: -35°C to 50°C [-31°C to 122°F]

Negative Output Terminal Torque
: 4 Nm [35 in-lbs]

Positive Output Terminal Torque
: 14-10 AWG = 4 Nm [35 in-lbs]
: 8 AWG = 4.5 Nm [40 in-lbs]
: 6.4 AWG = 5.1 Nm [45 in-lbs]

Ground Terminal Block Torque
: 4Nm [35 in-lbs]

Features & Benefits

- Combines up to 5 PV strings
- Converts to standard wires
- Completely pre-assembled
- Plug & play design provides labor savings and minimizes installer error during installation
- Uses existing products currently produced by Tyco Electronics
- UL 1741 listed

The SOLARLOK combiner box assembly is used to combine up to five strings in a preterminated 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 removable dust cover. The box features 4 knockouts (for output wiring), lock tab, mounting slots and pre-wired grounding bolt.

The interior of the box holds 5 holder 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 Number : 1954283-1

Application Tooling

Cable Assembly Tooling Specs

1 **Hand Crimp Tool**
for Screw Machine Contacts
Includes Crimp Head & Locator
PN : 3-1579014-7 (2.5 mm² & 4.0 mm²)
: 1-1579004-2 (4.0 mm² & 6.0 mm²)

2 **Extraction Tool**
(suitable for all wire sizes)
PN : 1102855-3
(Standard Line Connector)
PN : 1102855-9
(Slim Line Connector)

3 **Insulator Stripper**
Includes length stop for all wire size
(Suitable for our Solar Cable)
PN : 4-1579002-2
(2.5 mm², 4.0 mm² and 6.0 mm²)

SOLARLOK Electric Terminator CS 200

Base Machine : PN : 539630-1

Electrical Terminator CS 200
for Screw Machine Contacts

Adaptor for Crimp Head
PN : 1579000-4

Crimp Head
(2.5 mm² and 4.0 mm²)
PN : 3-1579016-8

Crimp Head
(4.0 mm² and 6.0 mm²)
PN : 7-1579001-9

Crimp Head (AWG 10)
PN : 8-1579001-2

Crimp Head (AWG 12)
PN : 5-1579001-5

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Application Tooling (continued)

Junction Box Assembly Tooling

1. **Wire Spring Clamp Tool**
   PN : 1579007-2
2. **Dioden/Jumper Spring Clamp Tool**
   PN : 1579007-5
3. **Foil Spring Clamp Tools**

   6 Rail Large Box (Shown)
   PN : 1579007-3

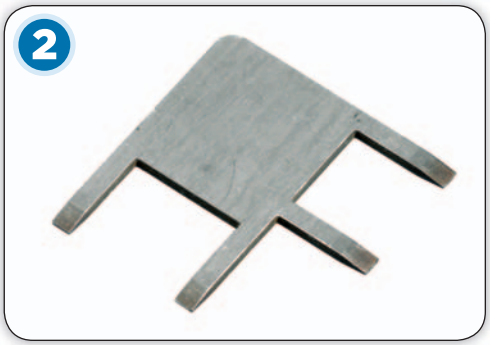
   5 Rail (Not Shown)
   PN : 1740969-3

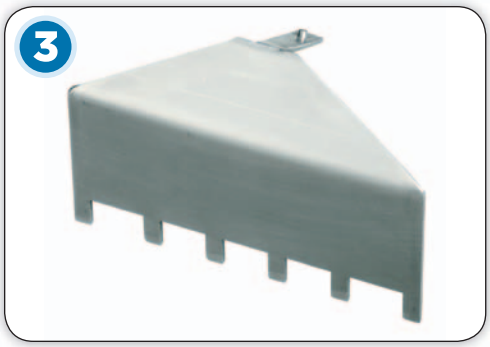
   4 Rail Medium Box (Not Shown)
   PN : 1740969-1

   3 Rail Small Box (Not Shown)
   PN : 1740969-2

Connector Assembly Tooling

4. **Hexagon Spanner Head for torque Wrench**
   PN : 523229-1 Size 13 mm
   (Standard Line Connector)
   PN: 523229-2 Size 11 mm
   (Slim Line Connector)
5. **Torque Wrench,**
   PN : 2161345-1, 1.2 – 3.0 Nm
   (Standard Line Connector)
   PN: 2161345-3, 0.3 – 1.2 Nm
   (Slim Line Connector)





Field Service Kit

Part Number : 1534858-1
(Metric Wire)

Included in Kit:

Hand Crimp Tool
PN : 1-1579004-2

Extraction Tool
PN : 1102855-3

Insulation Stripper
PN : 4-1579002-2

- 100 Cable Coupler
  (Housings, Plus and Minus coded)
  *Cable outer diameter 5.5 mm to 8.0 mm
- Crimp Contacts
  (4.0 mm^2 and 6.0 mm^2)
- Pinch ring
- Seals

SOLARLOK INSTALLER STARTER KIT, Standard Line Connector

Part Number : 5-1579010-4

Included in Kit:

Hand Crimp Tool
PN : 1-1579004-2

Extraction Tool
PN : 1102855-3

- 20 Cable Coupler
  (Housings, Plus and Minus coded)
  *Cable outer diameter 5.5 mm to 8.0 mm
- Crimp Contacts
  (6.0 mm^2)
- SOLARLOK Field Manual
- Instruction Sheets

SOLARLOK INSTALLER STARTER KIT, Slim Line Connector

Part Number : 6-1579010-4

USA: 1-800-522-6752
Canada: +1-905-475-6222
Mexico: +52 (0) 55-1106-0800
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Assembly and Installation Guidelines
SOLARLOK plug connectors

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.

SOLARLOK component cable can be labeled with label PN : 1718077-1.
(DO NOT DISCONNECT UNDER LOAD)

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. Failure to follow all instructions in Application Specification 114-18488 (available at www.tycoelectronics.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. Should be used only by individuals with proper training and experience.

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 essential.

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, and 6.0 mm^2, 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 #114-18488.

3.1 Handling of the Connectors

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

1 : Stripping the wire to 9 +/- 1mm without damaging the strands
(please refer to application specification **114-94061-1**)

Fig.1

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Assembly and Installation Guidelines (continued)

3.1 Handling of the Connectors (continued)

2 : Insert the stripped wire into the wire crimp barrel until it stops.

3 : While holding the wire in place, squeeze tool handles together until ratchet releases.

Fig. 2

4 : Push contact with cable into the connector housing (include seal/pinch ring combination and backshell) until you hear the contact is locked into position. To verify contact engagement, give a gentle pull back on the cable to be sure the contact is locked.

Fig. 3

5 : Tighten backshell nut to 1.3 +0.2 Nm.
(For tooling, please refer to page 33, item 5)

Fig. 4

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Assembly and Installation Guidelines (continued)

3.2 Connector Latching

When mating the SOLARLOK connectors, ensure the following:

1 : 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.

2 : The polarity of the "neutral" connector should be labeled with **Part Number : 1394725-1 or 1394725-2**.

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

Fig. 5
(female connector)

3.3 Disconnecting

CAUTION : DO NOT DISCONNECTED UNDER LOAD.

Disconnect circuit load before unplugging connectors by using approved devices (DC main switch, inverter connector and other devices). Cable assemblies should be labeled with **part number : 1394470-1**.

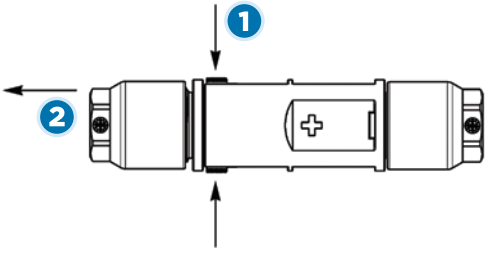

Fig. 6

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.

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Assembly and Installation Guidelines (continued)

Application Examples

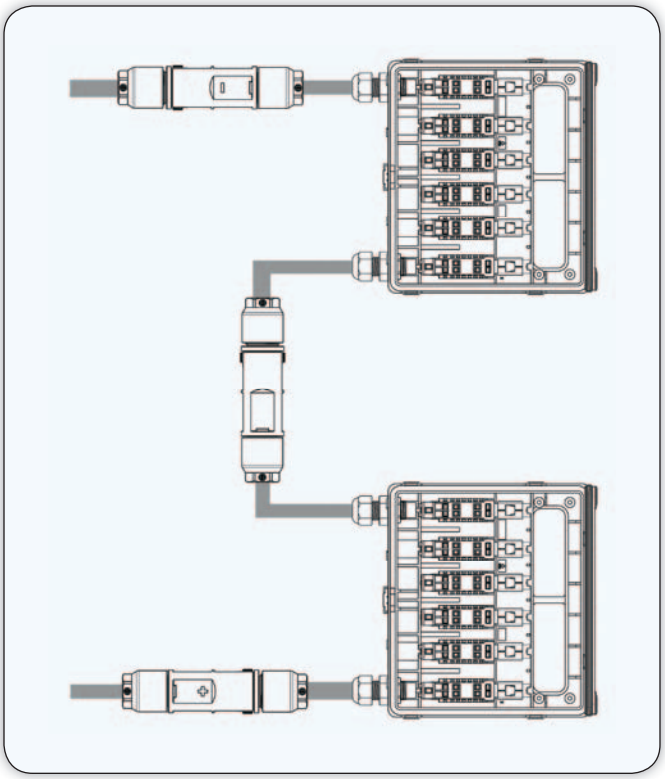

Fig. 7 : Serial (Wire Diagram)

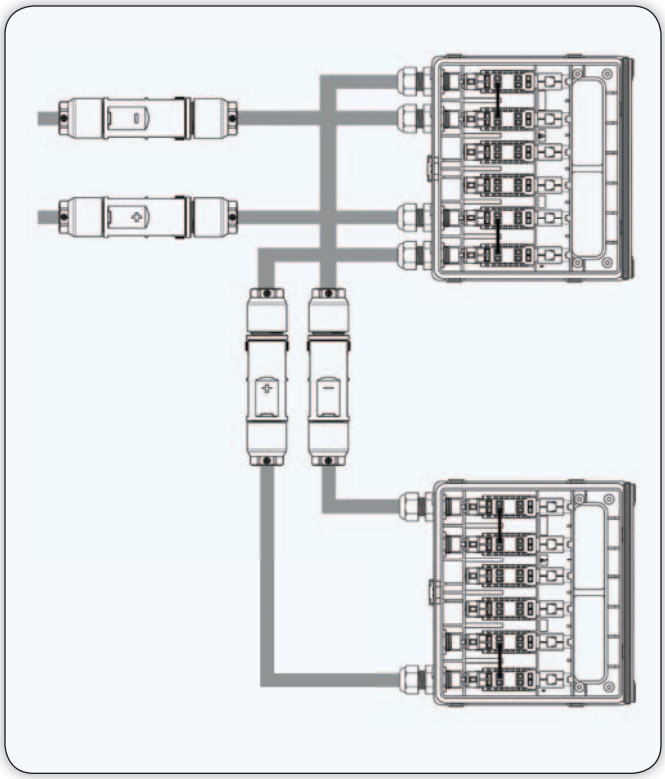

Fig. 8 : Parallel (Wire Diagram)

Storage See product specification **108-18701**

Tooling Find available tools for the contact crimping on page 32 (please specify the required wire gauge). An extraction tool (**part number 1102855-3 and 1102855-9**) is needed to disassemble the connector components. The tool is used to unlock the contact retention features, after which the contact can be removed and re-used one time if necessary.

Technical Description

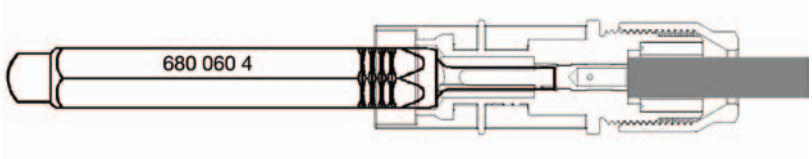

Fig. 9

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Engineering Notes

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