

The innovative SolarSpec™ Junction Box assembly, designed for robotic-assembly of silicon photovoltaic (PV) systems, reduces assembly time and production costs and delivers quality and value to PV-panel manufacturers



SolarSpec™ Junction Box and Cable Assemblies

93170 Junction Box and Cable Assemblies for Silicon Photovoltaic (PV) Solar Panels

The SolarSpec™ Junction Box from Molex is available for sale to global manufacturers of mono- and poly-crystalline photovoltaic (PV) solar modules. The Junction Box is a critical component of the PV module and serves as the interface between the conductor ribbons (similar to busbars) on the panel and the DC input and output cables used by installers to wire the panels in field applications.

The Molex SolarSpec™ Junction Box is a compact design which can supply current ratings comparable with traditional larger competitor products. Usage of a minimum number of component parts ensures less risk of potential mechanical failure.

The SolarSpec™ Junction Box can be attached to the PV panel using robotic pick-and-place machines which reduces the assembly time of a Junction box to a PV panel by a factor of up to 10. The SolarSpec™ DC cable assemblies supplied with the Molex Junction Box are also available for sale separately. For more information on all SolarSpec™ products visit: www.molex.com/link/solarjunctionbox.html



SolarSpec™ Junction Box and Cable Assemblies

FEATURES AND BENEFITS

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| • Diode and cable connections contained in removable top cover | • Facilitates easy access in the event repair or replacement is required |
| • Each Junction Box Assembly includes 2 x 4mm ² (12 AWG) Molex DC cables | • Simplifies the customer's ordering and assembly processes; guarantees quality |
| • Components are supplied packaged suitable for robotic pick-and-place assembly | • Automated production removes process variations, reduces panel assembly time and associated costs |
| • Spring-loaded terminals for connection to PV panel | • Less bulk resistance; facilitates automated soldering processes |
| • Optional Solder-Charge™ terminals | • No clips or clamps needed for retention of ribbon conductors |
| • Optional double-sided tape | • Eliminates the need for hand soldering of the ribbon conductors; enables high-speed assembly processes with consistent quality on each termination |
| • Spring-clip, cage-clamp terminals for cables on cover | • Removes the need for curing time on silicone when attaching base to PV panel |
| • One-way membrane vent on cover | • Securely attaches cables to the Junction Box and provides high cable pull-out values |
| • Maximum thermal efficiency ensures low heat generation | • Equalizes pressure within the box due to temperature changes and eliminates need for potting |
| • Locking mechanism to secure the base to the cover | • Avoids excessive heat build up for safe handling of junction boxes in field applications |
| • Junction Box has small overall dimensions | • Prevents accidental exposure of high-voltage contacts; requires tool to open |
| • Junction box and cable assemblies are dual-qualified by TÜV and UL | • Reduced volume, weight and profile when compared with similar competitor products |
| • Industry-accepted interface terminals | • Most recent global stringent quality standards are met to ensure long-life in harsh environments |
| | • Fewer mechanical parts and less risk of potential failure |

MARKETS AND APPLICATIONS

- Junction Boxes are assembled on to panels as part of the PV manufacturing process
- Cables are then connected together to link the panels in a serial grid array (parallel arrangements are also possible)
- Applications for solar Photovoltaic (PV) panels include:
 - Stadiums
 - Home installations
 - Public buildings
 - Solar farms (power plants)

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SPECIFICATIONS

Reference Information

Packaging:
Cardboard inserts
UL File No.: E331593
TUV File ref: R60027482
Designed In: Millimetres
RoHS: Yes
Halogen Free: Yes
Degree of protection: IP65

Electrical

Voltage rated (max.):
1000V DC (max workable voltage per module: 60V)
Current (max.): 9.0A
Contact Resistance:
<5 milliohms (top cover terminal to base unit terminal)
Dielectric Withstanding Voltage:
6000V min
Insulation Resistance: >400 Megaohms

Mechanical

Durability (min.):
20 cycles (top cover to base unit)
Cable pull-out force:
89N minimum (value measured on the nut and grommet)

Physical

Housing: PPO (Polyphenylene Oxide)
Contact: Copper alloy
Plating:
Contact Area — Silver (Ag)
Underplating — Nickel (Ni)
Dimensions:
Junction Box:
Length: 106mm (4.17")
by Width: 78mm (3.07")
by Height: 19.90mm (.783")
Cable diameter for gland:
5.80 to 7.10mm
Operating Temperature: -40°C to +85°C
Flammability class: 5VA



ORDERING INFORMATION

For complete Junction Box Assembly: Customers must order both panel assembly and cover assembly (includes cables)

Panel Assembly

Order No.	Solder Charge™ Terminals (Y/N)	Silicone or Tape attachment to PV panel
93170-3000	N	Silicone
93170-3011	Y	Tape
93170-3001		Silicone

Cover Assembly with Cables

Order No.	Cable Qualification	Cable Size	Cable Length	Attribute
93170-4010	Dual qualified (UL/TÜV)	4.00mm² (12AWG)	0.90m	Cables feature Molex DC Connectors
93170-4007	Single qualified (TÜV)			

Note: Other assembly configurations are available upon request - please contact the Global Product Manager for information and samples

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