

DC Cabling Ready for 1500V DC

Perfectly connected

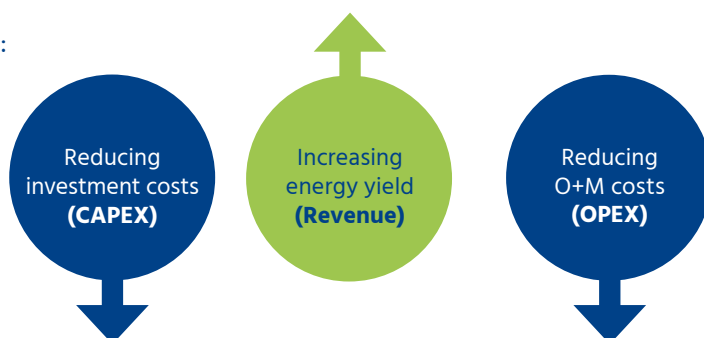


Reduce your LCOE

What causes PV costs?

Since 2010 the PV market has changed a lot. PV module costs have been reduced significantly, inverter costs have been halved. Despite this general decrease in costs the typical design of PV power plants didn't change remarkably. Along with its business partners, Jurchen Technology develops new and intelligent ways for a more efficient DC cabling and mechanical construction. The new 1,500 V DC technology is one of the most important PV evolution steps reducing the levelized costs of electricity (LCOE) significantly.

The 1,500 V DC advantage:



Experience and expertise

Since 2008 our products have been used for cabling photovoltaic systems - up to the present day they have yielded power of more than 4 GWp. In 2012 our 1,500 V DC cabling system SK-III was installed to power up a thin-film PV power plant in Germany for the first time. The combination of 1,500 V DC with our harness cabling technologies JuCon and SK-III enables a more efficient power plant design. Due to larger module strings with more PV panels less cabling is needed: fewer solar cable, fewer combiner boxes, less junctions and less installation time. With 1,500 V DC strings, up to 50% more PV panels can be interconnected. Furthermore the higher DC voltage reduces the required amount of inverter stations.

However, not only the investment costs are reduced considerably. Thanks to higher DC voltage level and fewer junction points the electrical power loss is reduced remarkably. Moreover, operation and maintenance costs can be reduced because less DC cabling and inverters have to be maintained.

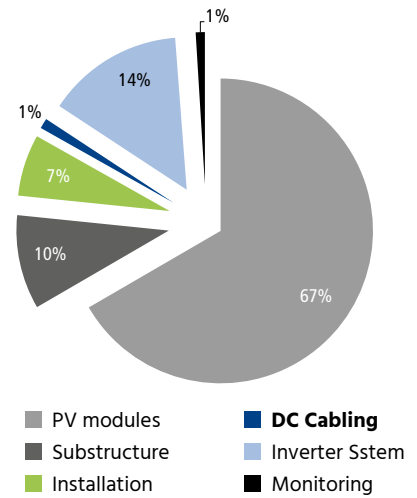
Jurchen Technology offers a wide range of innovative components for modern PV power systems. From low-loss 1,500 V DC cabling technology to cost-efficient PV module substructures for photovoltaic power plants, our product solutions are produced to reach best-in-class quality and reliability.

BENEFITS OF OUR 1,500 V DC PRODUCT range

- Wiring harness solutions JuCon and SK-III reduce the number of DC combiner boxes
- Saves up to 50% solar cable compared to typical single array solutions
- High quality connections, 1,500 V DC and fewer plug connections reduce DC power loss
- Rock solid quality ensures operation for decades independent to climatic conditions
- Easy to integrate, modular system with extensive accessories
- Wide product range of full-compatible substructure solutions and module clips for 1,500 V DC PV panels

DC cables are the “life veins” of every PV system. They have to defy wind and weather conditions for many years and reliably safeguard the electricity yields. Compared to other components the DC cabling only takes 1% of the investment costs of a PV power plant (right chart) - although it is one of the most important links of the electricity generation.

For this reason, PV power plant operators and investors should pay close attention to high quality and state-of-the-art DC components to enable a reliable, power generation for decades. Jurchen Technology develops and produces innovative DC systems and all components in-house with materials of highest quality. All DC components pass through several steps of quality management to ensure reliable and durable operation.



INDIVIDUALLY DESIGNED TO YOUR REQUIREMENTS

- TÜV and cTUVus verification
- Assembly according to customer requirements
- Fast on-site service and support
- Individually configured cables and quantities are produced on short notice



SK-III

Jurchen Technology produces harness cables (array harness) in a unique dual molding procedure. This guarantees a long product life-time, maximum impermeability, outstanding mechanical properties and high temperature resistance. The cables are preassembled according to customer requirements so that you can connect them fast and easily. Different diameters between 2.5 mm², 4 mm², 6 mm² and 10 mm² allow you to minimize possible line losses.

BENEFITS OF SK-III

- Solar project specific solutions
- 50% reduction of cable, 50% reduction of installation time
- Smaller PV array junction box possible
- In-line fuses and diodes can be integrated directly into the cable (e.g. JuCon SF and SD)

Technical data of SK-III	
1. Temperature range	
Ambient temperature range	-40°C... +90°C
Max. temperature at the conductor	120°C
2. Material	
Pre-molding material	PA, RoHS - compliant
Final molding material	PA/TPE, RoHS - compliant, UV resistant V0 according to UL 94 5VA
PV connector	Multi Contact - MC4 (tested according to IEC 62852:2014) Multi Contact - MC4-Evo 2 Phoenix Contact SUNCLIX (tested according to IEC 62852:2014) Amphenol H4 (tested according to IEC 62852:2014) Amphenol UTX Other PV-connectors on request
PV conductor (PV1-F & PV Wire)	Diameter 2,5 mm ² , 4 mm ² , 6 mm ² and 10mm ² Tinned stranded copper wire class 5 IEC 60228
3. Mechanical data	
IP Code	IP68 (10 days/1m)
Protection class	Fulfills the requirements of protection class II
4. Electrical data	
Rated voltage	Up to 1,500 V DC (depends on the used PV conductor and connector)
Rated current	Depends on the used PV conductor and connector
DC voltage proof (according to TÜV 2 PfG 1913/04.11)	1.5kV _{DC} / 240h (NaCl - solution)
Contact resistance (measured acc. to TÜV 2 PfG 1913/04.11: directly at the output of the cables of the molding of connection splice)	R ≤ 0.5mΩ

Comparison

Conventional DC systems vs. SK-III harness system (crystalline Si PV modules):

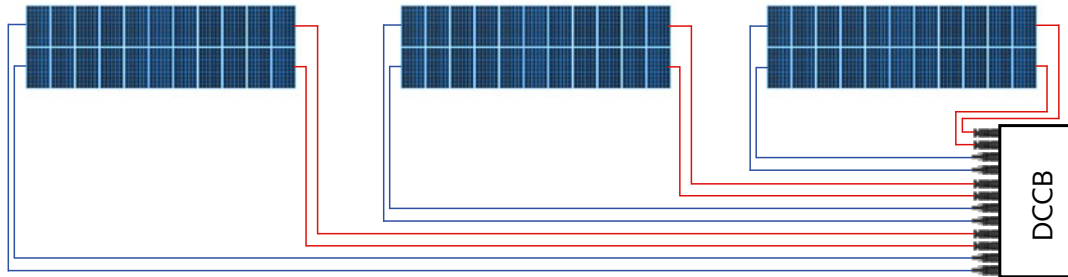


Figure above: With conventional systems every PV module string (Si) will be connected directly to inverter input or DC combiner box.

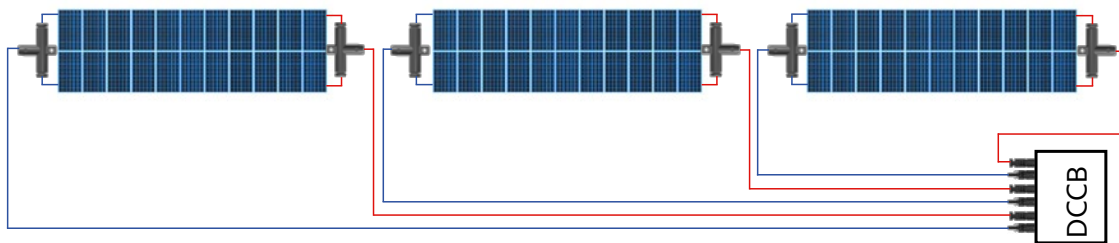
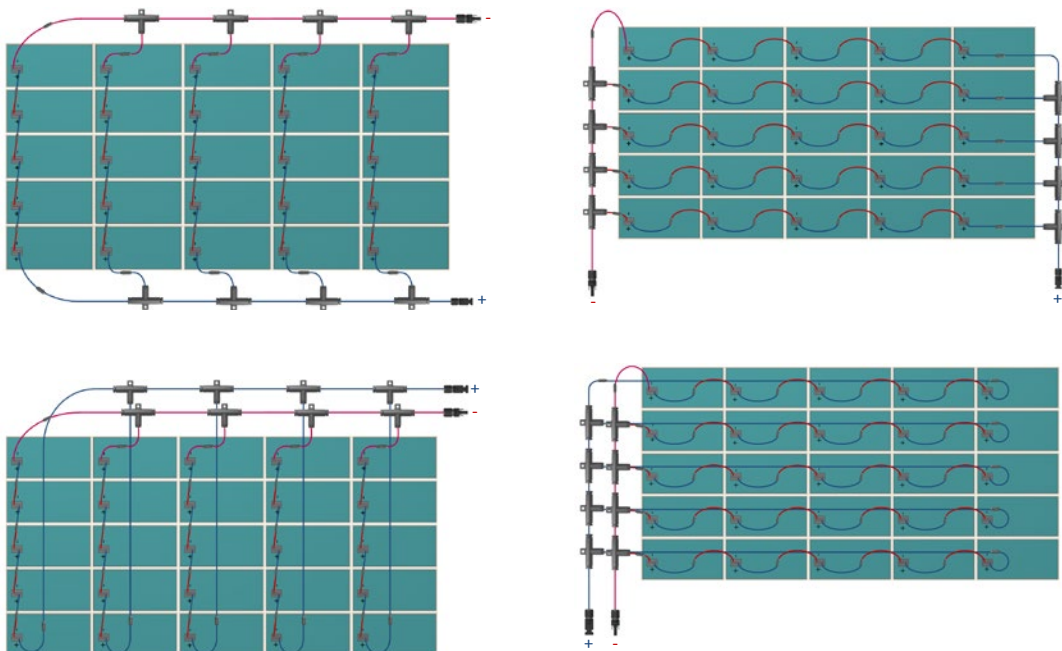


Figure above: With Jurchen Technology SK-III wiring harness systems two PV module strings (Si) will be merged to one DC line, which will be routed to inverter input or DC combiner box. As a result 50% of solar cable and connections are saved.

Variation examples

of SK-III harness system layouts with thin-film PV modules:



JuCon

The new JuCon DC cabling system is the best-in-class solution for cost- and yield-efficient PV power plants. Our product range consists of Single- (ES series) and Dual-Polarity (DS series) wiring harness units and additional cabling components like in-line fuses. For covering the cables JuCon uses the same material as for the sheath of the solar cable. The process of vulcanization between sheathing and JuCon leads to irreversible, chemical cross-linking between the materials.

BENEFITS OF JUCON

- No DC cable yield losses: vulcanized crimping insures minimal contact resistance
- No system failures due to extreme durability and weather resistance
- Minimum assembling of connectors at site installation
- In-line fuses can be integrated into wiring harness
- Proven resistance to weathering, UV and ozone resistance
- 25+ years service life, due to vulcanisation technology bonding/seal (cross-linking of materials)
- Saltwater resistance
- Proven system since 2012
- TÜV certification up to 1500 V
- Perfect for Floating Solar

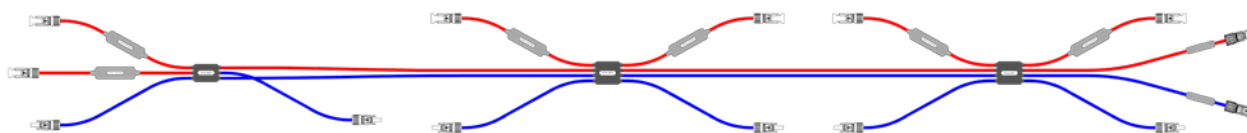


Figure above: JuCon DS cabling system with dual-polarity units and integrated in-line fuses and diodes.

The JuCon system design is extremely flexible and adapts individually to the most different applications. We develop the perfect system layout according to your PV modules and inverter configuration and choose the appropriate conductor cross-sections. The JuCon system is offered in single-string and double-string design. The distance between each JuCon junction may vary according to the structure and dimensions of the used PV panels.

JuCon Y-Plug



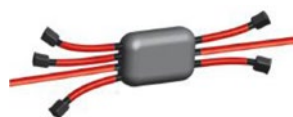
JuCon ES-2



JuCon ES-4



JuCon ES-5



Technical data	
Rated voltage	Up to 1500 V DC
Insulation material	EVA-Compound, 120°C acc. to DIN VDE 0282-2, HD22.1
Ambient temperature	-40°C to +90°C
Max. operating temperature	-40°C to +120°C
Resistance against	Ozone acc. to 2PFG 1913/03.21
	UV acc. to 2PFG 1913/03.21
	Moisture heat (steam heat test): 1000 h at 90 °C and 85% humidity, according to DIN EN 60068-2-78
	Long-term-resistance of insulation to DC acc. to 2PFG 1913/03.21: 240h, 1.5kV DC in water at 85°C
Flammability (internal tests)	Ammonia, 30 days in saturated NH ₃ -atmosphere (internal test)
	Single cable acc. to DIN EN 60332-1-2
	Multiple cable acc. to DIN EN 50305-9
	Lower smoke emission acc. to DIN EN 50268-2
Degree of protection	Absence of Halogens acc. to EN 50525-1, appendix B
	Lower toxicity acc. to DIN EN 50305
Spark test	IP 68 (1h, 1 m)
Dielectric strength acc. to 2 PFG 1913/03.21	16kV _{AC}
Contact resistance (measured acc. to TÜV 2 PFG 1913/03.21: directly at the output of the cables of the moulding of connection splice)	Voltage test 1 h in water, 6.5kV _{AC} (5 minutes)
Tensile test	≤ 0.5mΩ
	acc. to TÜV 2 PFG 1913/03.21

Nominal cross sectional area	Current rating at kind of laying		
	Single cable free in air	Single cable on a surface	Two loaded cables touching on a surface
mm ²	A	A	A
6	70	67	57

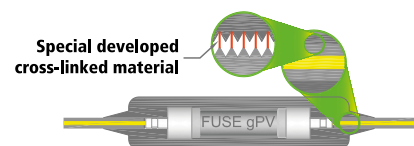
Conversion factors for different ambient temperatures	
Ambient temperature °C	Conversion factor
up to 60	1.00
70	0.92
80	0.84
90	0.75

Extensive 1500 V DC accessories:

JuCon In-line fuses

Covered with cross-linked material - pluggable with pre-harnessed connectors or fitted in the PV string harness.

- Over-current protection < 30A (depending on the fuse being used)
- Protects strings from reverse current overload
- Assembly according to customer's specifications



German PV specialist for powerful connections

Jurchen Technology specializes in the development and production of high-quality components for photovoltaic systems. We are the only provider on the market to offer a dual and innovative component solution for photovoltaic plants. We manufacture both the substructure and the appropriate high-quality DC cabling for photovoltaic systems from the rooftop to the PV power plant.

- Development and production of high-quality PV components
- Manufacturing sites in Germany and India
- Products are integrated into more than 4 Gigawatt photovoltaic plants worldwide
- Leading quality management with mechanical, electrical, thermal and climatic tests to ensure a reliable long-term operation
- Pre-configured 1,500 V DC cabling solutions
- Manufacturer certified clips for frame-less and framed 1,500 V DC PV panels



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All data may subject to alterations and errors.