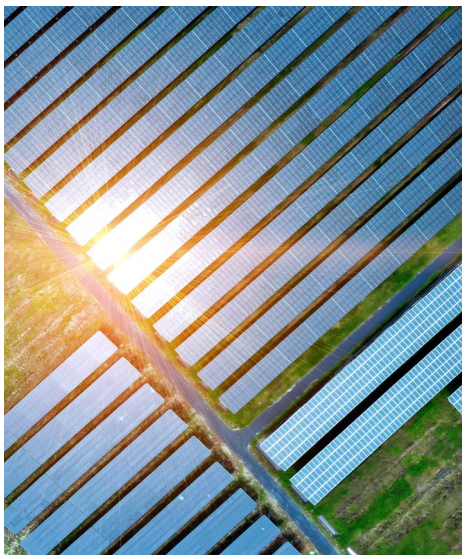


CUSTOMIZABLE TRUNK SOLUTION CTS

TRANSFORMING HOW SOLAR FARMS APPROACH ELECTRICAL BALANCE OF SYSTEM EBOS

Suitable for utility-scale solar farms of any size, location and mounting structure

ACCELERATING THE DEPLOYMENT OF UTILITY-SCALE SOLAR FARMS

The climate conversation has never been more urgent. With fossil fuel emissions contributing to record-high carbon dioxide levels, the time to act is now.

Accelerating the build of solar farms is an important and necessary step in providing a viable, green energy source for our planet. This requires a collaborative effort from all stakeholders - farm owners, Engineering, Procurement and Construction companies EPCs, designers and manufacturers.

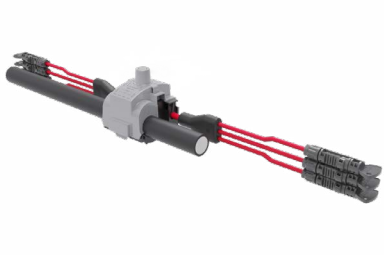
How can we help?
The electrical balance of systems EBOS is a critical component of any solar farm. TE Connectivity has built a next-generation EBOS solution which is cost-effective, durable and easy to install.

AN OPTIMIZED, HIGH-PERFORMING EBOS

TE´s Customizable Trunk Solution CTS has been engineered to address the limitations of a traditional EBOS architecture and bring more flexibility, reliability and efficiency to your solar farm.

CONCEPTS	TRADITIONAL EBOS	CUSTOMIZABLE TRUNK SOLUTION CTS
DESIGN & LAYOUT	Restrictions to adapt the design and layout of solar farm.	Full flexibility with N-S and E-W orientation.
CABLING REQUIREMENTS	Requires large lengths of copper string cable which are expensive.	Up to 3x less copper string cables required.
	Loose cables and connectors are prone to breaking and can damage the PV back sheet.	Optimized assembly management with short jumper wires and secure connections to the trunk bus cable.
INSTALLATION	Time-consuming installation, prone to human error.	Easy installation using standard tools and plug and play components.
	Expensive trenching is required to bury the cables underground.	Flexibility to choose below or above ground cable installation.
	Combiner boxes must be close to the PV panels.	Only 5 terminations meet in each disconnect box which can be clustered and placed close to the inverter.
RISK LEVEL	High risk of overheating due to the number of electrical components in each combiner box.	Extremely low risk of overheating due to reduced number of electrical components within the disconnect boxes.
MAINTENANCE	High maintenance demands on Operation & Maintenance teams.	No operational maintenance required.

Made up of three core components, our CTS can be used in any solar farm using a central inverter approach, regardless of size, location and mounting structure.

SOLAR IPC ASSEMBLIES	PV WIRING HARNESSES	DISCONNECT BOXES
		
Provide insulation piercing technology for fast, safe connections with no insulation cutback.	Provide inline overcurrent protection close to the panel, with a pre-assembled and customizable design.	Protect low voltage systems from power surges and reduce the number of cable terminations required.

EXPERT TEAMS + VALUE-ADDED SUPPORT

Trust our expert engineering teams to get the maximum efficiency from your solar project:

- Consultancy (drawings and calculations)
- Efficiency and optimization recommendations
- Customized in-field training
- Assistance with post-implementation queries

HIGH QUALITY + BUILT TO LAST

HIGH PERFORMANCE EVEN IN THE TOUGHEST ENVIRONMENTS

Thanks to our engineering expertise and investment in materials science, the components of CTS have been designed and manufactured to high quality standards.

They are certified and tested to perform even in the harshest environments - including extreme temperature variations, UV exposure and moisture - ensuring reliable operational performance throughout the lifetime of the solar farm installation.

EFFICIENCY + RELIABILITY

DESIGN FLEXIBILITY, COMPATIBLE WITH ANY MOUNTING STRUCTURE

The inline fused harnesses and SIPCs offer high flexibility in the design of your solar farm, enabling you to choose a N-S or E-W orientation.

The disconnect boxes can be clustered at strategic points, considerably reducing the lengths and cost of aluminum cable required. An aboveground cable management system increases the ampacity of cables by 20-30%, removes the need for extensive trenching and makes it easier and safer for operational and maintenance staff to perform their tasks.

FAST INSTALLATION + LOW MAINTENANCE

EASE OF USE WITH PLUG & PLAY COMPONENTS

The CTS architecture has been designed to enable fast and simple installation with plug and play components.

The Solar IPCs require no cable insulation cutback and the inline fused harnesses come pre-assembled with embedded fuses, reducing labor time and costs.

The disconnect boxes hold just 5 terminations. This helps to reduce the risk of overheating, ensuring electrical power continuity. There is also little or no need for maintenance of the boxes.

WHAT'S MORE, OUR COMPONENTS ARE COMPATIBLE WITH ANY TRACKER MANUFACTURER.

TECHNICAL DATA

SOLAR IPC ASSEMBLIES

Our Solar IPC assembly offers protection, insulation and high quality sealing, connecting PV cables easily and safely.

FEATURES

- cUL and IEC certified[1]

Designed to connect PV cables up to 1500V:

- Bus cable: single and double insulated stranded (class 2) Al cables
- Wiring harness: single and double insulated flexible (class B and class 5) Cu cables
- PV cables range up to 1000kcmil and 400mm^2

Tested to:

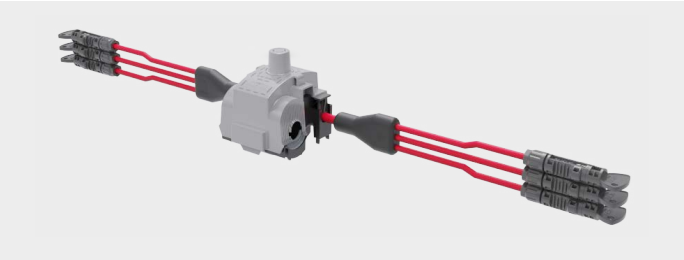
- EN 50483-4 (reference standard in Europe for IPCs)
- Applicable tests from IEC 62852 (Solar DC mate cable connectors)
- UL9703

Listed to:

- UL 486A-B, CSA C22.22
- UL 9703
- Made with UV-stable and impact-resistant plastic raw materials
- Flammability class: V0 UL 94 & IEC 60695-11-10, -20
- UV-stable and impact-resistant housing with a latch that protects against humidity and water
- One piece connector block with shear bolt technology
- Halogen-free, UV-resistant, flame-retardant

BENEFITS

- Easy to install with standard tooling
- Wide range of cable sizes
- No insulation cutback required
- Reliable tightening torque
- Watertight connection thanks to elastomeric seal
- Provides a reliable transition from copper to aluminum
- Low leakage current
- Suitable for outdoor applications
- Adjusts to connection spacing on-site
- Functions as a tap connector on a mid-span or dead-end application



[1] Further information on our product certifications and tests is available on request.

PV WIRING HARNESSES

Our PV wiring harnesses are versatile and adaptable to different solar farm applications. They provide protection close to the panel with pre-assembled, embedded fuses.

FEATURES

- Designed for solar farm applications up to 1500V and 60A with multiple gauge options #12AWG - #6AWG and 4mm^2 – 16mm^2
- Range of fuse protection from 5A to 60A
- A variety of harness configurations are available: inline overmolded fuses, branching, whips and string jumpers
- The harnesses are labelled with a unique serial number/ bar code for traceability purposes.
- Available in different wire colors and cable wire options
- UL 9703 compliant – exceeds x 4 aging and environmental requirements
- 100% compatibility with panel manufacturers

BENEFITS

- Solid and robust connections thanks to the use of two different compounds in the harnesses. This offsets the thermal expansion factor
- Extensive checks and production tests are performed on the parts to ensure the reliability and longevity of the inline fused harnesses (e.g. resistance, weight, submersion leakage)

DISCONNECT BOXES

The CTS architecture eliminates the need for combiner boxes. We use a disconnect box which is quick and easy to install.

FEATURES	BENEFITS
• Disconnect boxes are rated for 1500V and 500A load break with surge arrestor and common ground capabilities • Polyester enclosure reinforced with fiberglass and UV-resistant • NEMA 4x rated corrosion protection • Surge protection device type I or I+II • 5 connections required to complete the installation • Multiple inputs (up to 4) per disconnect box • Range of output conductors up to 1000kcmil and 500mm^2 • Designed according to IEC 61439—2 • UL 1741 compliant	• Simple design with 2 trunk bus input and 2 output connections. • Keeps temperatures stable, reducing the risk of overheating and power loss. • Equipped with shear bolt connectors for easy installation (optional). • Almost x3 faster to install than traditional combiner box (45 minutes vs 2 hours) • Boxes can be clustered strategically and placed closer to the inverter in order to save on trenching and DC feeder cable costs.

WHAT YOU GET WITH TE

EXPERIENCE + EXPERTISE + EXCELLENCE

TE has proven experience and expertise in the design, manufacture and implementation of our Customizable Trunk Solution.

We have made significant investment in building EBOS solution components that meet the most stringent standards of excellence to ensure the long-term durability and reliability of your solar farm installation.

Our customers receive dedicated consultancy and support from our skilled teams of engineers, from design to delivery, and every step in-between.

30+
YEARS SOLAR ENGINEERING EXPERIENCE

715+
MILLION USD INVESTMENT IN ENGINEERING AND R&D

9
MANUFACTURING SITES OF ENERGY PRODUCTS AROUND THE WORLD

115+
PATENTS IN SOLAR PV INDUSTRY

UP TO 30%
MORE TRUNK CABLE CARRYING CAPACITY OVERGROUND VS UNDERGROUND

UP TO 50%
REDUCTION IN INSTALLATION TIME

UP TO 40%
SAVINGS IN MATERIAL COSTS

IN-HOUSE EXPERTISE
IN LV DC, MV & HV AC, GROUNDING SYSTEMS

100%
SUSTAINABLE PACKAGING AVAILABLE

5
YEARS WARRANTY WORLDWIDE

CUSTOMER CASE STUDY

REGION:
North America

FARM TYPE:
140 MW Solar Farm

CUSTOMER CHALLENGE:
A large solar Engineering Procurement and Construction company EPC was tasked with controlling the costs associated with the installation, operation and maintenance of their solar plant on a site prone to flooding.

TE SOLUTION:
A complete package to connect 350,000 solar modules leveraging TE's Customizable Trunk Solution architecture:

- Insulation piercing connectors with gel
- Inline fused harnesses
- Disconnect boxes

This was achieved with dedicated engineering consulting, offering voltage drop and wire current calculations as well as onsite installation training.

OUTCOME:

- Reduced cable and installation costs by 40%
- Reduced voltage losses to 1.5 % for increased efficiency and savings over the lifetime of the solar farm

Learn more: TE.com/Solar