Take Solar Safety to the Next Level

Be smart. be safe

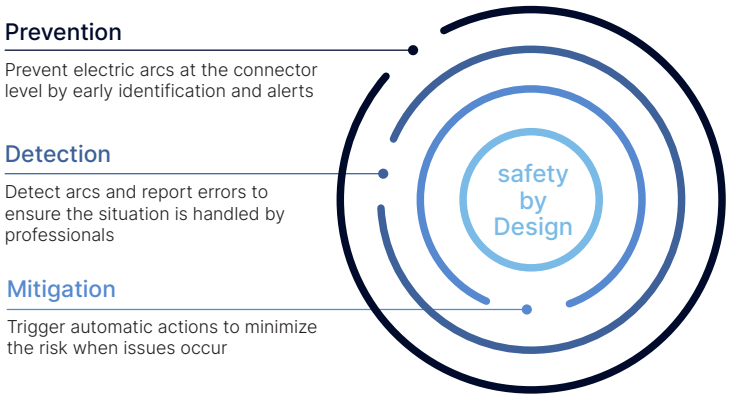
Rooftop PV systems are gaining in popularity, often seen as wise long-term investments while providing energy resiliency, sustainability, energy bill savings, and fast ROI. The widespread adoption of solar power has only reinforced the need for industry stakeholders to make PV safety their top priority.

You can't turn off the sun

The fire risk posed by PV systems is widely considered to be extremely low. Even so, PV systems maintain high DC voltages even when the system is switched off. This necessitates safety mechanisms starting at the module level to enhance protection in the unlikely event of a fire or other emergency.

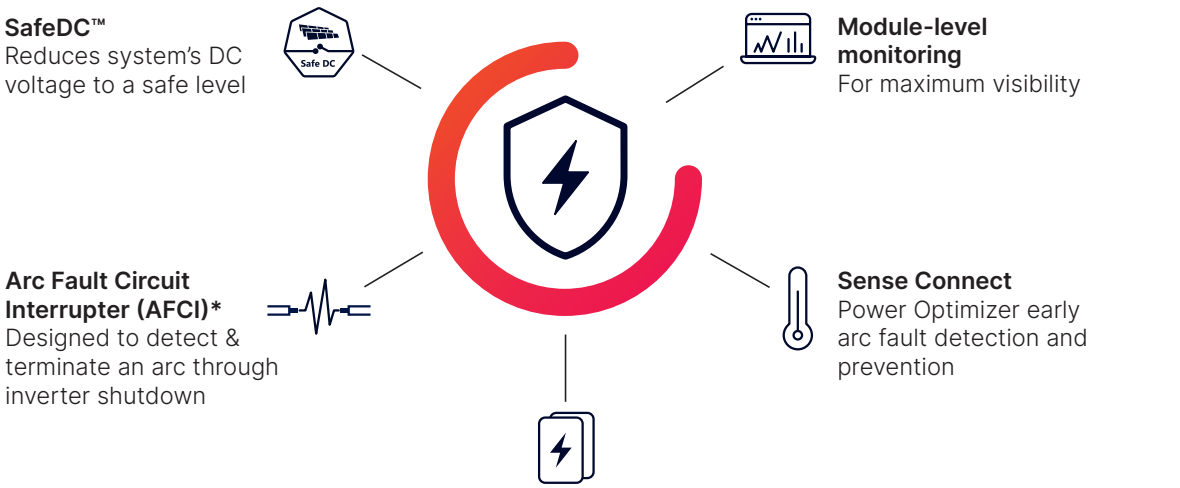
SolarEdge's holistic approach to PV safety

SolarEdge goes the extra mile, with layers of integrated safety mechanisms that collaborate to safeguard installers, technicians, firefighters, and homeowners from potential emergencies, protecting people and property and maintaining a safer environment throughout the system's lifetime.



SolarEdge Home safety solution: on the cutting edge of solar safety

A complete end-to-end ecosystem, like SolarEdge Home, is essential to ensure comprehensive safety. Our safety features are built-in, not added third-party products.
We continuously strive to pioneer cutting-edge PV safety features, challenging ourselves to go further to protect what matters most to our customers.



* Safety functionalities above may vary between different inverter models and firmware versions

Module-Level Monitoring

Real-Time Module-Level Visibility

Module-level details are always at your fingertips, enabling:

- Easy identification of underperforming modules
- Performance loss or potential safety risk reporting throughout the system's lifetime

Remote monitoring- gives you the information you need to perform proper, regular maintenance

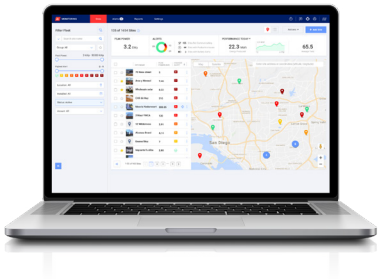
Alerts

Automatic, pinpointed notifications on system issues to prevent potential safety risks, such as:

- CTM (Connector Temperature Measurement) at the module level
- Bypass diodes failure
- Battery issues
- RCD (Residual Current Device) errors

Troubleshooting recommendations:

- From roof to grid - covering all SolarEdge Home ecosystem devices
- Enables remote resolution of select issues without an on-site visit
- Troubleshooting videos

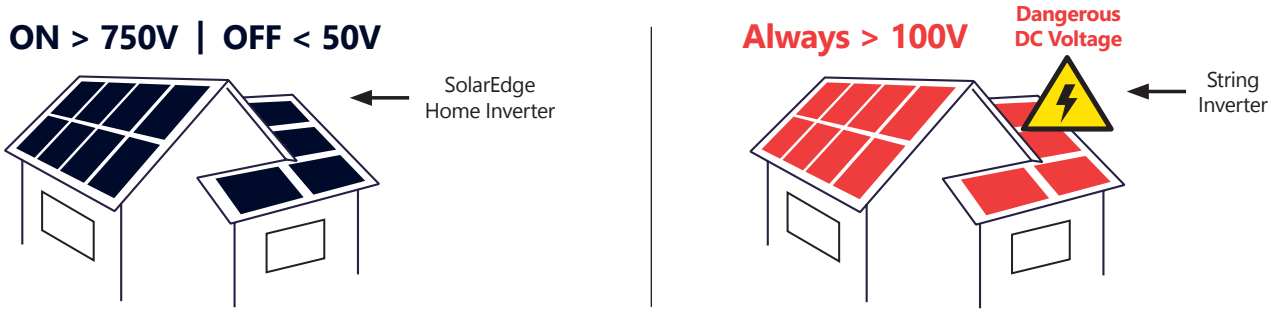


Know the health of the system, down to each module, from Day 1 - for ultimate visibility and peace of mind. **Homeowners benefit from enhanced safety, resulting in increased system uptime for greater savings and quicker return on investment.**

Advanced safety with SafeDC™

SolarEdge's SafeDC™ is designed to enable a safer environment for installers during both installation and maintenance, as well as for emergency teams in the event of a fire hazard.

- As long as the sun is up, modules will be energized. In traditional string inverters, modules and wiring retain high voltage during daylight hours, even when the inverter is shut down. This makes it unsafe to touch and poses a safety risk in the event of an emergency, as well as during regular installation and maintenance activities.
- Without adequate precautions, a high DC voltage can lead to electrocution and burn hazards and can severely restrict first responders from operating in a safe environment, especially when energized DC cables/isolation start to melt due to higher temperatures causing a risk of arcs.
- **SolarEdge Power Optimizers are designed to automatically reduce the DC voltage to 1V DC** in the event of any of the following:
  - Grid failure* or inverter shutdown
  - Safety incidents, such as a potential arc or isolation issue, which can be caused by fire, melting the wires/ connections, or flooding
  - Electric disconnection of the Power Optimizers' strings from the inverter - either by DC switch, disconnecting the string from the inverter, or cut cables
- SafeDC™ is certified in Europe as a DC disconnect according to IEC/EN 60947-1 and IEC/ EN 60947-3 and to the safety standards VDE AR 2100-712 and OVE R-11-1.



Our patented SafeDC™ technology works with the SolarEdge Home ecosystem to ensure the output voltage of each module is automatically reduced to safe 1V when needed, making the whole system safer, protecting people and property.

* For Wave inverters. For Hub inverters configured for Backup operation, this situation initiates backup mode. shut off the On/Off/P switches is required in order to turn off the backup.

Electric arcs - one of the main potential causes of PV fires

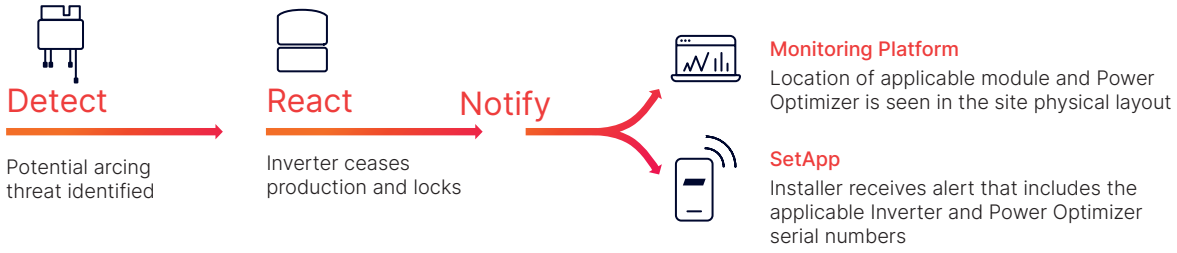
Arcing in a PV system is a high-energy discharge caused by a current flowing through a non-conductive medium such as air. It produces intense heat that can harm people touching the system and if overlooked can quickly become a fire hazard. This can arise from various factors, including:

- Damaged or improperly connected connectors and/or cables
- Components' degradation over time increases risk while still low (e.g. connectors and cables)
- Rodents damaging the cables

Safety at the connector level- SolarEdge Sense Connect for arc fault prevention

With Sense Connect technology, you will deliver maximized PV site protection. Featuring patented Sense Connect technology, SolarEdge S-Series Power Optimizers are designed to automatically detect and prevent potential electric arcs at the connector level before an arc is created.

With the ability to detect an abnormal temperature at the input and output connectors of the Power Optimizer, Sense Connect constantly monitors and identifies improper connections and possible malfunctions from connector wear and tear. In case of malfunction, the inverter will stop power flow before an arc occurs and activate the SafeDC™ mechanism, while reporting the error to the monitoring platform for appropriate maintenance. This extra level of protection goes beyond the existing arc detection compliance standards.



https://knowledge-center.solaredge.com/sites/kc/files/se-sense-connect-application-note.pdf

This technology is supported by the S-Series Power Optimizers and inverters having CPU version 4.17.xxx or later.

Arc Fault Circuit Interrupter (AFCI)

In compliance with IEC63027 arc detection standard*, SolarEdge inverters have built-in protection designed to protect against the effects of arcing faults. SolarEdge complies with this requirement that defines automatic shutdown of inverters until necessary checks can be undertaken and manual restart where the inverter remains in standby/night mode pending a status change.

This helps to increase personal safety, protecting the home and the homeowner's solar investment. In addition, SolarEdge has a range of products that comply with the US standard UL1699B since 2013 and meet its requirements**.

SolarEdge's Sense Connect and AFCI features work seamlessly together to intelligently prevent, detect, and terminate electrical arcs, ensuring an added layer of security for homeowners.

* SolarEdge inverters that comply with the IEC63027 are SolarEdge Home Wave/ Hub Inverters- Three-Phase, gradually rolled out across Europe starting FW version 4.20.

** For SolarEdge inverters that comply with the UL1699B refer to the following app note: https://knowledge-center.solaredge.com/sites/kc/files/arc_fault_detection_application_note.pdf

SolarEdge is setting industry-leading safety measures for battery protection

- The SolarEdge Home Battery 400V and SolarEdge Home Battery 48V use a mix of software and hardware safety measures, working as a closed and independent decision-making system, offer continuous protection through measurement and monitoring of battery's cells current, voltage, State of Health, and temperature levels to mitigate battery overheating.
- SolarEdge Home Batteries comply with the most advanced safety regulations, including:

IEC62619

The main safety standard for safe operation of lithium cells and batteries used in residential and industrial applications, related to both cells & overall battery safety.

IEC63056

Energy storage safety standard which specifies requirements for the product safety of secondary lithium cells and batteries used in electrical energy storage systems.
This document provides additional, specific requirements on top of IEC62619.

VDE-AR-E 2510-50

A strict German safety standard which is small houses and residential fleet oriented, specifies safety requirements for stationary battery energy storage systems (BESS) with lithium batteries.

UL9540A

A standard for the test method for evaluating thermal runaway fire propagation in battery energy storage systems, promising that in case of cell thermal runaway, no fire will be exposed externally of the battery. This is one of the strictest test methods, hence it is also referenced in EU standards, such as IEC 62933-5-2. It's also adopted by fire departments around the world, ensuring high-level safety mitigation for firefighters.

UN38.3

The UN38.3 standard has 4 classifications in which lithium-based batteries will undergo testing based on how the battery becomes transported. The standard defines tests in various areas of altitude, thermal, vibration, mechanical shock, short circuit, overcharge, and undercharge.

- SolarEdge Home Battery 400V complies with standards IEC62619, UL9540A, UN38.3.
- SolarEdge Home Battery 48V complies with standards IEC62619, IEC63056, VDE-AR-E 2510-50, UN38.3.

SolarEdge Home Batteries may either be ground or wall-mounted and either indoor or outdoor, enabling greater design flexibility for the battery and other applications, and mounted even in proximity to other batteries- saving time and costs.

Our batteries prioritize home safety, mitigating fire or hazard risks. It offers more flexible installation, added convenience, aesthetic appeal, and adaptability for future upgrades.

SolarEdge Home Battery 48V

SolarEdge Home Battery 400V

Summary

SolarEdge's strong foundation for a holistic safety approach is built on three pillars: **prevention, detection**, and **mitigation**. Through thoughtful design and advanced technology, we work to include safeguards and monitoring at all system levels- ensuring that SolarEdge Home takes a multi-layered and proactive approach to mitigating hazards.

A SolarEdge Home is a safer home.

Recognized by TNO – A Leading Energy Research Lab

Explore how SolarEdge multi-layered safety features- SolarEdge's Sense Connect, SafeDC™ and AFCI have exceeded industry standards and set new benchmarks in safety, according to independent European research organization, TNO, via validation test that was performed in TNO's "Solar Laboratory" in Petten, Netherlands***.

*** The AFCI, Sense Connect and SafeDC of S440 optimizers and SE3680H inverter (without battery) for operation were tested, represents the residential S-Series Power Optimizers and SolarEdge Home Wave Inverters- Single Phase.

"At TNO's state-of-the-art facilities, we performed numerous tests at multiple power levels simulating different conditions of real-life scenarios to assure the validity of each safety features"..."Sense Connect and SafeDC are complementary safety measures which exceed global safety standards"

N.J.J. (Nico) Dekker, Medior Scientist Specialist, TNO

SolarEdge Technologies is a global leader in renewable energy technology that applies world-class engineering and innovation to provide solar PV solutions for the residential, commercial and utility segments. SolarEdge brings an optimized approach to generating, storing, managing and consuming energy. The company develops and produces PV inverters and Power Optimizers, energy management and optimization solutions, energy storage and grid services. SolarEdge's DC-optimized technology is installed in millions of homes in over 140 countries, and more than 50% of Fortune 100 companies have SolarEdge technology on their rooftops. SolarEdge is accelerating the transition towards distributed, sustainable energy networks which will optimize energy everywhere.

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