

GUIDANCE NOTE

Plug-in Solar Panels – Safety

Disclaimer

This document, including the accompanying two-page safety brief, is issued for information and knowledge-sharing purposes. It may be revised following further review, stakeholder input, or updates to standards or regulations.

The content is provided to support discussion and awareness of good practice across the public sector. The use of plug-in solar panels in the UK is new, with regulations and safety features being refined by market and standards organisations. Readers should check the latest guidance at GOV.UK (Search ‘Plug in Solar Power”) and <https://energysavingtrust.org.uk/advice/plug-in-solar-panels>. While reasonable efforts have been made to present information accurately, no representation or warranty is given as to its completeness, accuracy, or fitness for any particular purpose.

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Feedback can be returned to the Non Domestic Buildings team at NWNZHub@liverpoolcityregion-ca.gov.uk

GUIDANCE NOTE

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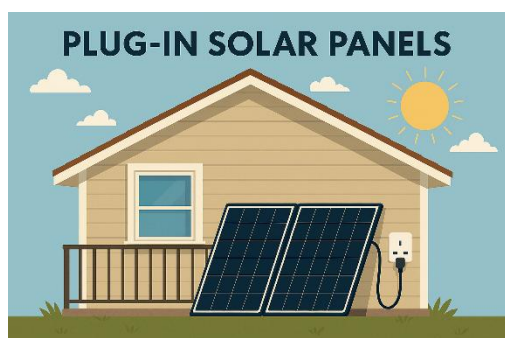
Important – Please read

This guidance provides general information on the safe use of plug-in solar panels in UK homes. It is intended to help householders understand key considerations but does not replace advice from a qualified electrician or a property-specific assessment. Further information can be obtained from the Energy Saving Trust's website.

Electrical installations vary significantly between homes, particularly in older housing stock, and additional factors may apply in individual cases.

Introduction

Plug-in solar panels are small-scale solar systems designed to connect directly to a standard UK household socket. A typical system includes one or more solar panels, a small inverter that converts the electricity into a usable form, and a cable fitted with a standard 13-amp plug.



These products are being introduced as part of wider efforts to reduce energy bills, improve access to renewable energy, and support the transition to low-carbon energy systems. They are expected to be particularly useful for households who cannot install conventional rooftop solar, such as those living in flats or rented accommodation. As these products are new to

the UK market, rules and safety standards are still developing. Readers should check the latest GOV.UK / DESNZ guidance on plug-in solar.

General safety principles

When used appropriately, plug-in solar panels can operate safely in many UK homes. However, unlike most household appliances, they generate electricity rather than consuming it. This means they introduce energy into the home's wiring system, and their safe operation depends on three key factors:

- the condition of the existing electrical installation
- the quality and compliance of the product
- how the equipment is connected and used in practice

Most modern UK homes are designed with safety devices that manage electrical faults effectively. Where installations are older or in unknown condition, additional care may be required.

Before you plug in

Before using plug-in solar equipment, a few simple checks can provide reassurance that the chosen connection point is suitable.

The socket used should be a fixed wall outlet in good condition. It should not feel loose when a plug is inserted, and there should be no visible signs of damage, such as cracking, discolouration, or overheating marks.

It is also important to avoid using multi-way adaptors or extension leads. These are not designed for continuous generation and can introduce additional connection points where faults or overheating may occur.

For those seeking reassurance, simple plug-in socket testers are widely available from electrical retailers at relatively low cost (typically around £10–£30). These devices are inserted into a socket and use indicator lights (usually LEDs) to show whether the socket wiring is correct. They can identify common issues such as reversed polarity or a missing earth connection.

While these testers are useful, it is important to understand their limitations. A socket tester only checks for a small number of basic wiring faults at that specific outlet. It does not assess the overall condition of the circuit, the quality of connections elsewhere in the installation, or whether the circuit is suitable for additional load or generation. As such, it should be seen as a screening tool, not a full safety check.

If a socket tester indicates a fault, or if there is any uncertainty about the result, the socket should not be used until advice has been sought from a qualified electrician.

Condition of the electrical installation

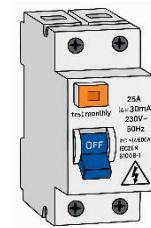
Plug-in solar panels rely entirely on the home's existing wiring. In many properties this will be suitable, particularly where installations have been updated or maintained in recent years. However, it is important to recognise that some UK homes still have older or modified electrical systems.

In some cases, wiring may not meet current standards, may have been altered over time, or may simply not have been inspected for many years. While this does not necessarily mean it is unsafe, it does introduce greater uncertainty.

Householders should consider seeking professional advice where:

- the electrical installation has not been inspected within the last ten years (Rental properties **MUST** have been inspected within the prior 5 years)

- the consumer unit (fuse box) does not include modern safety devices such as RCDs (Residual Current Devices, which provide protection against electric shock)
- there are known issues such as damaged sockets or unreliable circuits
- the condition or history of the wiring is unknown



This should be seen as a precaution, not a requirement. Many homes will be suitable without modification, but understanding the condition of the installation helps reduce risk.

Using plug-in solar safely

Once basic checks have been completed, safe use of plug-in solar panels largely comes down to good practice and following the manufacturer's instructions.

Plug-in solar panels are normally installed outdoors, for example on a balcony, wall, or in a garden, where they can receive direct sunlight. Installing indoors will reduce performance.

Where panels are installed outside, consider the fixing methods and how the cable is routed back to the socket. The safest arrangement is to use a suitable outdoor-rated socket or a purpose-designed cable entry point through the wall.

Running cables through windows or doors is not recommended, as this can cause damage over time (for example through crushing or wear), particularly where the cable is repeatedly moved or trapped.

If this arrangement is used temporarily, care should be taken to ensure the cable is protected from damage and not tightly trapped.

Only products that meet UK safety requirements should be used. These are typically indicated by markings such as UKCA or CE, along with clear documentation and installation guidance. Product quality is an important factor, as performance and safety features can vary between devices.

It is also important to be aware that plug-in solar systems generate electricity during daylight hours, meaning sockets may remain energised even when household circuits are switched off. This is normal behaviour but reinforces the importance of using suitable equipment and connections and telling electricians that plug-in panels are present.

Weather exposure and secure mounting

Plug-in solar panels should be secured in accordance with the manufacturer's instructions. Householders should avoid improvised fixing methods and should not rely on fixing restraints unless these are approved by the manufacturer and suitable for the intended location.

Properly installed panels should be suitable for most UK weather events. However, in very severe weather, users should follow the manufacturer's guidance on whether the panel can remain in place or should be temporarily removed. The precautionary approach is to disconnect the system and, where advised, bring the panel indoors before bad weather.

Owners should make periodic visual checks to confirm that all fixing components are tight, undamaged and free from visible corrosion, weathering or ultraviolet degradation. The panel should not be able to lift, swing, rattle or move significantly in normal wind and checks are advised after storms, high winds, etc.

Users should check lease or tenancy conditions, building rules and home insurance before installing plug-in solar equipment. If in doubt, consult your landlord first.

Understanding potential risks

Plug-in solar panels change the way electricity flows within the home. Instead of electricity only being supplied from the grid, some electricity is generated locally and fed into the home's wiring. For this reason, plug-in solar devices must be registered before use at myplugin.solar. Registration provides a simple way to notify the local electricity network operator, helping them understand and manage changes in electricity flows across the network.

In well-maintained installations, this is typically accommodated without issue. However, in certain circumstances, particularly where wiring is older or in poor condition, this change in behaviour can increase potential fire risks such as:

- localised overloading of parts of a circuit
- heating at loose or worn electrical connections
- reduced visibility of developing faults

These risks are not unique to plug-in solar, but the presence of an additional energy source means it is important to check installation condition and correct use.

Final remarks

Plug-in solar panels provide an accessible way for more households to benefit from renewable energy and reduce electricity bills. When used with basic safety awareness and an understanding of the home's wiring, they can form a useful part of the transition to low-carbon energy.

Taking a few simple precautions, checking the socket, using appropriate equipment, and being aware of the limits of the installation will help ensure they are used safely and effectively.

TECHNICAL ANNEX

Plug-in Solar (Plug-in PV) – Engineering Context

This annex provides additional technical context for advisors, practitioners, and more informed users. It sets out how plug-in solar systems interact with UK domestic electrical installations and identifies key uncertainties.

System characteristics and operating model

Plug-in solar systems are small inverter-based generators, typically in the range of 400–800 watts per unit. Unlike conventional solar PV systems, which are permanently connected to the consumer unit, these systems connect via a standard BS 1363 plug and socket.

Their operation is based on what is often described as a “no-modification” approach. This means the system is intended to operate safely using the existing electrical installation without requiring changes to wiring, protection devices, or the consumer unit. This assumption is central to the safety case.

Interaction with domestic circuits

UK homes commonly use ring final circuits in which multiple sockets are connected in a loop and protected by a single circuit breaker. These circuits are designed for typical patterns of electricity demand, with power flowing from the consumer unit outwards to loads.

Plug-in solar introduces a local source of generation at a socket. This alters current flow patterns within the circuit. In particular, it can result in electricity flowing “backwards” towards the consumer unit or between different parts of the ring.

Under normal conditions this does not necessarily create a hazard. However, it changes the distribution of current within the circuit and can increase loading in specific sections, particularly where additional appliances are in use.

Protective devices and fault behaviour

Modern domestic installations typically include miniature circuit breakers (MCBs) and Residual Current Devices (RCDs). MCBs protect against excessive current (which can cause overheating), while RCDs detect imbalances between live and neutral conductors that may indicate electric shock risk.

These devices generally continue to operate with embedded generation present, as they respond to current magnitude or imbalance rather than its direction. However, their performance depends on the characteristics of the installation and the inverters used.

In older installations, protection may be limited or absent. In such cases, the introduction of continuous generation increases reliance on the existing system operating as intended.

Thermal effects and connection quality

A key area of concern is the condition of connections, particularly at socket outlets. Worn or degraded contacts can introduce electrical resistance, causing local overheating.

Because plug-in solar systems may operate for extended periods during daylight hours, they can create sustained current flow through these connections.

This makes the condition of sockets and terminations a more important factor than for many conventional household appliances.

Variability in product performance

Plug-in solar devices are not uniform in their behaviour and only products that meet UK safety and network requirements should be used. Devices that do not meet relevant safety standards may exhibit unpredictable behaviour under fault or sustained operating conditions, including overheating or protection failure.



Use of socket testers

Portable socket testers are a useful but limited diagnostic tool. These devices, typically handheld and plug-in, contain simple circuits and indicator lights that assess whether key connections within a socket are present and correctly wired.

They provide a quick indication of issues such as reversed live and neutral conductors and/or absence of a protective earth connection.

However, they do not test the wider circuit. In particular, they cannot assess:

- the integrity of connections elsewhere in the wiring
- the continuity of ring circuits
- earth fault loop impedance (how effectively the system can clear faults)
- the performance of RCDs
- degradation due to age or thermal stress

For this reason, they are best regarded as an initial screening method rather than a substitute for a full safety assessment.

Installation condition and risk context

The safety evidence for plug-in PV systems is based on installations that are broadly in good condition and functioning as intended. In practice, the UK housing stock includes a wide range of installation ages and conditions.

Where installations are degraded, modified, or not compliant with current standards, the interaction with embedded generation becomes less predictable. In such cases, risks associated with overheating, fault detection, and protective device performance may be increased.

This does not preclude use, but it supports a proportionate approach in which the condition of the installation is considered alongside the intended use.

Management of Physical Risks

In addition to electrical safety, externally mounted plug-in PV systems introduce a mechanical safety consideration. Panels must resist wind uplift, vibration and movement over the expected life of the installation. This is particularly important where a falling panel could reach a public or shared area. The installation should not be treated as low risk simply because the panel is relatively small.

Manufacturers' mounting systems should specify the intended fixing arrangement, inspection frequency (e.g. after storms) and location restrictions. From a risk management perspective, the key question is whether the complete system, including panel, fixing kit and supporting structure, is suitable. Manufacturer guidance should always be followed.

Where applicable, users should check lease/rental conditions, building rules and home insurance before installing plug-in solar equipment. If in doubt, the landlord should be consulted first.

Regulatory context

Plug-in solar systems require a legislative adjustment to existing UK frameworks, which generally assume that generation equipment is permanently connected and installed by competent persons. To enable this, the government proposes to amend the Plugs and Sockets etc. (Safety) Regulations 1994 (PSSR) to explicitly allow compliant plug-in solar devices to be connected to standard mains sockets and introduce a temporary technical standard so that only compliant products may be sold.

Other relevant standards include:

- BS 7671 (IET Wiring Regulations), which governs electrical installations
- ENA Engineering Recommendations (such as G98), which address the connection of small-scale generation, specifically EREC G98 Issue 2 Amendment 1, which sets out the operational requirements of plug-in solar units as well as exemptions

Plug-in solar will be enabled through updated standards covering product conformity, power export limits, mandatory registration / DNO notification requirements and consumer guidance.

Summary

Plug-in solar systems can operate safely within UK homes when used within defined limits. The key factors influencing safety are the condition of the installation, the characteristics of the product, and user behaviour.

References

- i. Press release 16 June 2026: More families to benefit from lower bills through plug-in panels [More families to benefit from lower bills through plug-in panels - GOV.UK](#)
- ii. Plug-in solar: Regulatory amendment and interim product specification [Plug-in solar: Regulatory amendment and interim product specification - GOV.UK](#)
- iii. RAF013/2526 Plug-in PV Systems in the United Kingdom, Electrical Safety, Compatibility and Implementation Considerations [RAF013/2526 Plug-in PV Systems in the United Kingdom](#)

Plug-in Solar Panels (Plug-in PV)

Safety Guidance

Important – Please read

This guidance provides general information on the safe use of plug-in solar panels in UK homes. It does not replace advice from a qualified electrician. Electrical installations vary, particularly in older homes, and additional considerations may apply.

What are plug-in solar panels?

Plug-in solar panels are small-scale solar systems designed to connect directly to a standard UK household socket. A typical system includes 1-2 solar panels, a small inverter (which converts the electricity produced into a usable form), and a cable with a 13-amp plug.

They are expected to become widely available from high street retailers and are intended for use in locations such as balconies, external walls, or gardens, where they can receive direct sunlight. They offer a simple way to generate daytime electricity, particularly for flats, rented properties, or homes without suitable roofs, reducing electricity costs for users by c.£100-£200/year (assuming a 0.8kW unit, savings dependant on actual usage/application).

Are they safe?

When used correctly, plug-in solar panels can operate safely in many homes. However, unlike most appliances, they generate electricity and feed it into the home's wiring, which means they interact with the existing electrical system in a new way. The main risks relate to:

- overheating and potential fire at poor electrical connections
- circuits carrying more current than intended
- existing safety devices not performing as expected

These risks are not inherent to the technology itself but are influenced by three key factors:

1. **Condition of the home's electrical installation**
2. **Quality and compliance of the product**
3. **How the system is connected and used**

1. Condition of home wiring and sockets

Plug-in solar panels rely entirely on the existing electrical installation. In many homes this will be suitable, particularly where wiring is modern and has been maintained. However, older or altered installations introduce greater uncertainty.

You should check that the socket used is in good condition. It should be firmly fixed, with no signs of damage, looseness, or overheating.

A simple plug-in socket tester can be used as an optional check. These are devices available from electrical retailers which use indicator lights to identify common wiring faults, such as incorrect connections or a missing earth, but they do not assess the condition of the wider circuit. Seek advice from a qualified electrician if:

- the building electrical system has not been inspected within the last 10 years (5 years for rented properties) or if the condition or history of the wiring is unknown

- the incoming supply does not include RCD protection (protecting against electric shock)

This is a precautionary step rather than a requirement. Many homes will be suitable without modification.

2. Product quality and compliance

Product quality is an important factor in safe operation. Plug-in solar systems operate on a “no-modification” basis, meaning they are intended to work safely without changes to existing wiring or consumer units. They are designed to rely on the correct operation of existing UK safety devices such as circuit breakers and RCDs and include protection that automatically disconnects the system in the event of a power cut (often referred to as anti-islanding protection).

Only products that meet UK safety requirements should be used, these are marked with UKCA or CE marking and supplied with appropriate instructions. As with other electrical equipment, non-compliant products carry increased risks of overheating or other failure.

Plug-in solar devices must be registered before use through the UK plug-in solar registration website: myplugin.solar, this provides a simple way for consumers to notify their local electricity network operator (DNO) who need to know where power is entering the network. Users will normally need their name, postcode, and the make/model of the device.

3. Installation and use

Plug-in solar panels are normally installed outdoors to allow exposure to direct sunlight. Indoor use is possible (e.g. behind a window) but this significantly reduces performance.

In all cases, carefully consider how the cable is routed to a standard wall socket to avoid wear or trip hazards.

- Ideally use an outdoor-rated socket or a dedicated cable entry through the wall
- Routing cables permanently through window or door openings is not recommended, as this can cause damage over time through accidental trapping or crushing.

Extension leads and multi-way adaptors should be avoided, as they introduce additional connection points and are not designed for continuous generation.

4. Weather and secure mounting

Where panels are fixed to balconies, railings, walls or other external locations, they must be secured using the manufacturer’s approved fixing method. Straps, clamps or brackets should be checked regularly to ensure they are tight, undamaged and not degraded by weathering.

Before very high winds or storms, users should check the manufacturer’s guidance. The safest approach is to disconnect and bring the panel indoors before the weather worsens.

If a panel falls and causes injury or damage, liability will depend on the circumstances, including installation, maintenance, permissions and insurance, so following the manufacturer’s guidance is essential.

Further Information

More detailed technical guidance, including engineering considerations and regulatory context, is provided in the Plug-in PV Safety Technical Annex.

The Energy Saving Trust provides the main consumer-facing guidance and a plug-in solar checklist at: <https://energysavingtrust.org.uk/advice/plug-in-solar-panels>.