UPS Selection Guide for Electricians

Helping you to choose the right UPS battery back-up for homes and small to medium businesses

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Life Is On | Schneider Electric

Our lives are getting more digital and more electricity dependent

Electricians are in an ideal position to make households and businesses aware that the usage of intelligent technology demands power that is free of interruption or disturbance.

Residential

As the smart home market continues to expand, it is driving a growing need to be “always on”. Residents need to manage a multitude of functions from thermostats and lights to blinds and garage doors, both while at home and remotely via a smart phone.

Even more traditional homes can benefit from power back-up solutions for the entertainment system, major appliances, pumps or network equipment such as an Internet router. This is especially crucial now that working from home is more prevalent.

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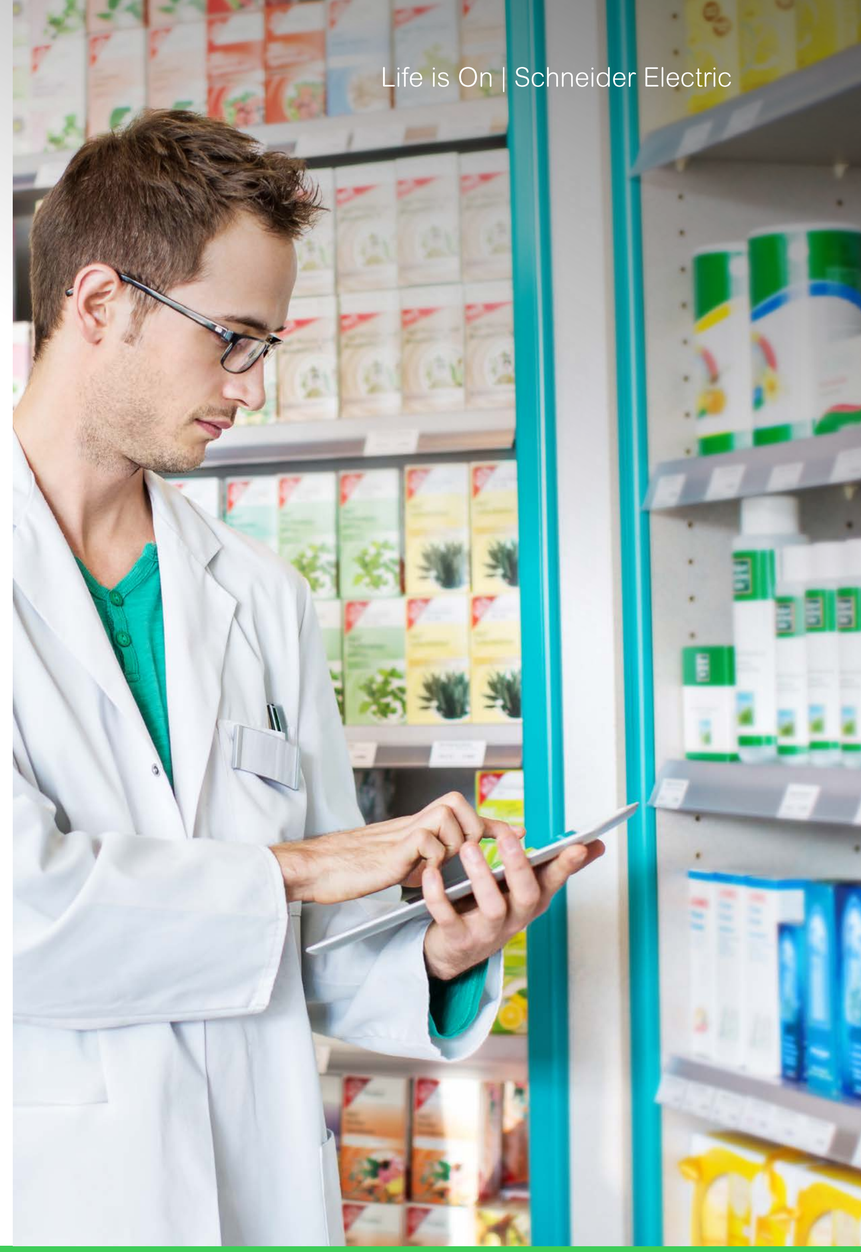
Small to medium businesses

For businesses housed in smaller buildings, electricity is often crucial to daily operation – even if business owners don't think much about it.

Examples of small buildings that can benefit from UPS protection include restaurants, grocery stores, hotels, retail shops, food and beverage companies, dry cleaners and launderettes, pharmacies and veterinary clinics, to name a few.

Uninterruptible Power Supply

UPS offers guaranteed power protection for connected devices. When power is interrupted, or fluctuates outside of safe levels, a UPS will instantly provide clean battery back-up power and surge protection for plugged-in, sensitive equipment.



Top residential applications

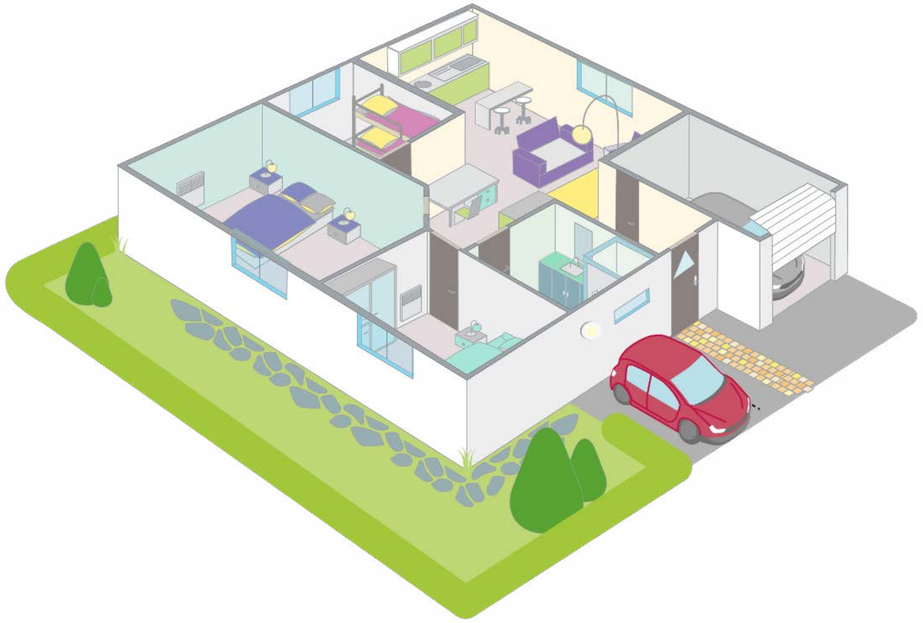
Sophisticated technology is commonly used in our homes and to run our careers, and the advent of e-commerce has completely changed the way we behave and interact in our new world.

Home electronics and security systems

Almost every home now has some sort of entertainment system and a router supplying an Internet connection to many devices, which also need charging. Many have come to really depend on these devices for work and communication. Home security systems may also warrant back-up power protection, such as video surveillance systems that operate around the clock.

Window blinds and garage doors

Many homes today have motorised window blinds or shutters that go up and down at the push of a button. It's not at all unusual to lose power during a storm, so a UPS would ensure the homeowner can still operate their shutters even if the power is out. Similarly, garage doors can be an issue. While some systems enable the user to disengage the motor and open and close the door manually, others are impossible to open and close without power.



Top residential applications

Pumps

Residents may not think about power protection for different pump applications. Many homes with chronically wet basements have sump pumps to keep the basement dry. Homes with swimming pools rely on pumps to circulate water to keep it clean.

Major appliances

UPSs can protect major appliances such as refrigerators, freezers, washing machines and dishwashers in a number of ways. One is to supply back-up power in the event of an outage, and another is to protect the appliances from power surges or jitter.

Medical equipment

A power outage could even be life threatening when critical medical devices are impacted. Home medical equipment such as respirators, tube feeding devices and medical beds would almost certainly require power protection for patient wellbeing.

Top business applications

Intelligent technology demands power that is free of interruption or disturbance

Business process continuity

Point of Sales systems (POS) are critical in retail environments for performing essential functions such as capturing sales trends, tracking inventories and managing customer information.

Businesses like bakeries and restaurants need to ensure that their ovens, stoves and refrigerators are always functioning. If any of these systems fail because of loss of power, then the business's custom and reputation would suffer.

Most businesses now also have various applications that involve data, whether it's inventory control systems or data management tools to promote efficiency and track consumer behaviour. They likely have networking equipment providing connectivity both within the building and to the Internet.

Safety and security systems

Safety and security systems are important to any business – in some cases even more so when the power goes out.

Burglar alarms and security cameras, for instance, should still function through an outage. Likewise, fire alarms, smoke extraction and emergency lighting systems need to remain alive.

Protection for heating and cooling systems

HVAC systems that provide heating, cooling and ventilation for a business also warrant UPS protection.

If a failure of these systems can generate discomfort for employees, clients and customers, it can also be business critical.

1.1 to 2.2 billion euros

This is the estimated annual cost of unplanned downtime to Fortune 1000 companies

Our technological world has become deeply dependent upon the continuous availability of electrical power

Many power problems originate in the commercial power grid, which is subject to damage from weather variations as well as equipment failure. Such disturbances include transients, interruption, sag, voltage fluctuation or frequency variations.

Transient

Potentially the most damaging type of power disturbance, transients cause momentary variations in current, voltage, or frequency.

Interruption

Power interruptions present a complete loss of supply voltage or load current.

Sag

Reduction of AC voltage at a given frequency, sags are usually caused by heavy power draw at startup or by system faults.

Undervoltage

Undervoltages are the result of long-term problems that create sags. Temporary decreases in power lasting up to over a minute. (Also called brownouts).

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Swell

The reverse of a sag, characterised by an increase in AC voltage. High-impedance neutral connections and sudden load reductions are common sources.

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Frequency variation

Changes in alternating current (AC) flows, frequency variations may occur with heavily loaded generators or poor power infrastructure.

Voltage fluctuation

A series of voltage changes or cyclic variations of the voltage waveform envelope, generally below 25 Hz.

Waveform distortion

There are five types of waveform distortions:

- DC offset
- Harmonics
- Interharmonics
- Notching
- Noise

What are the different types of UPS technologies?

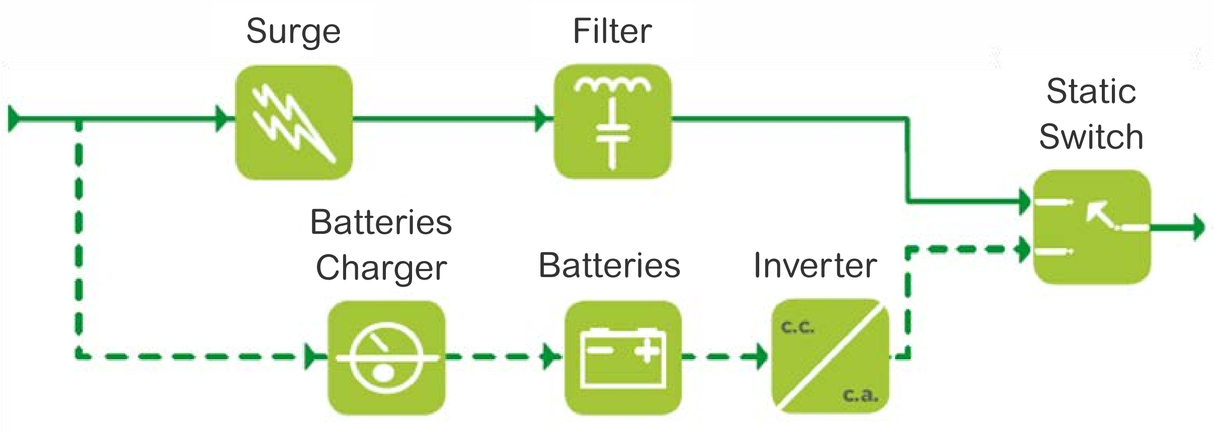
The different UPS types have attributes that make them more or less suitable for different applications.

Standby

Benefits – Low cost, best value for personal workstations

Limitations – Uses battery during brownouts, impractical over 2kVA

Features – Surge protection, battery back-up



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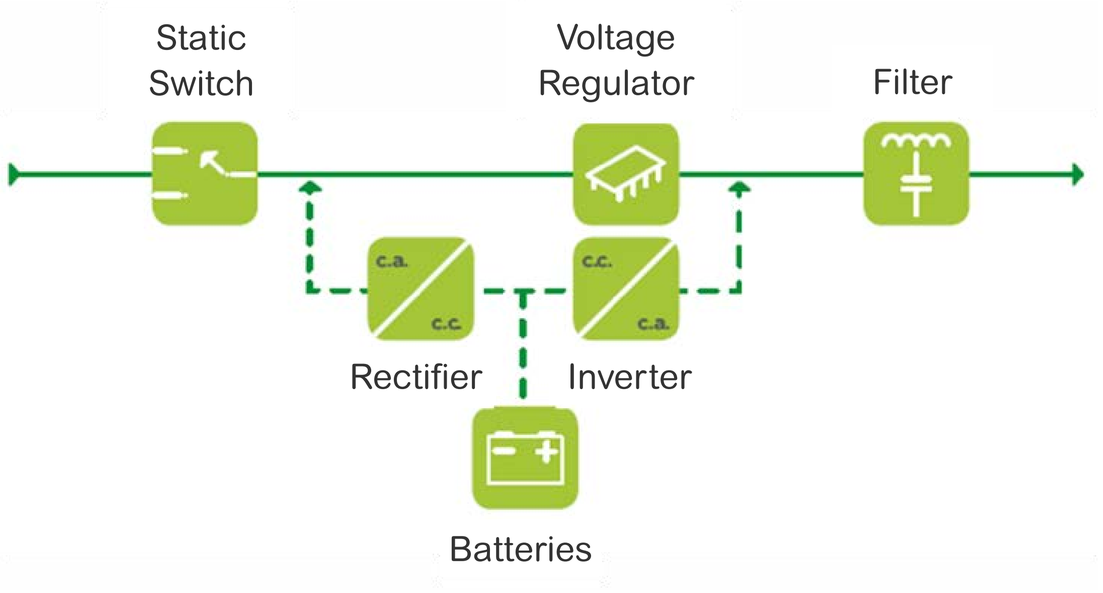
Line Interactive

Benefits – High reliability, ideal for racks or distributed servers

Limitations – Impractical over 5kVA

Features – Surge protection, battery back-up, voltage regulation, overvoltage protection, pure sine wave



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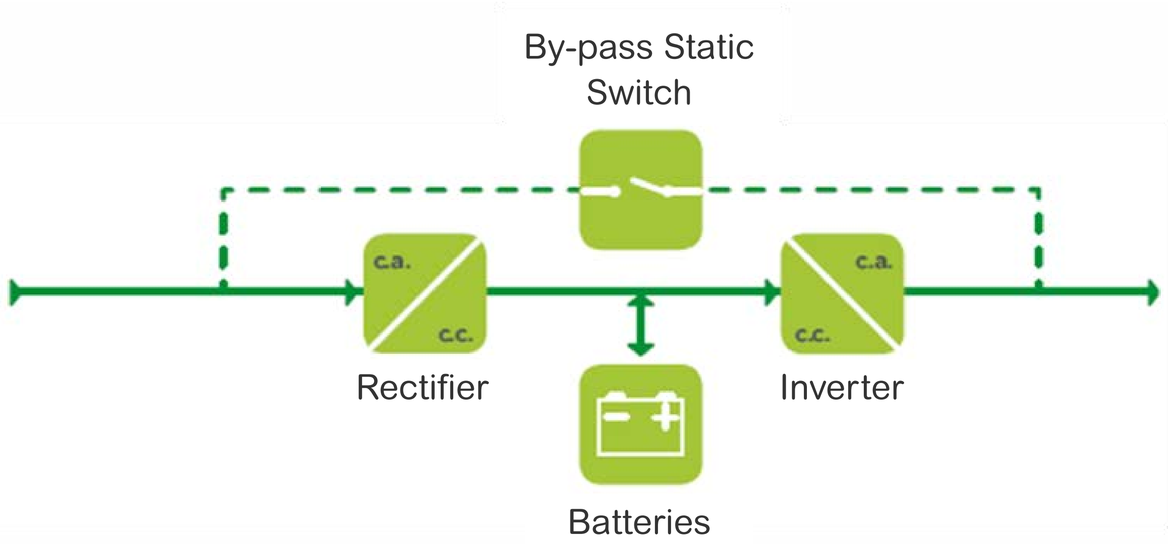
Double Conversion Line

Benefits – Excellent voltage conditioning, ease of paralleling, well suited for +1 designs

Limitations – Expensive below 5kVA

Features – Surge protection, battery back-up, voltage regulation, overvoltage protection, pure sine wave, double conversion online



Choosing the right UPS for your customer

Several key factors should be taken into consideration when selecting a UPS, such as its power rating and battery runtime.

Sizing of the UPS

Electronics have both maximum watt ratings and maximum VA (volt-ampere) ratings. Neither rating can be exceeded by attached equipment. Watts measure real power drawn by the equipment, while volt-amps are the product of the voltage applied to the equipment multiplied by the current drawn by the equipment.

Power factor

For computers and UPS units, watt and VA ratings can differ significantly, although VA rating is always equal to or larger than watt rating. The ratio of watts to VA is called the ‘power factor’ and is expressed either as a number (i.e. 0.8) or a percentage (i.e. 80%). When sizing a UPS for your specific requirements, the power factor matters most. Generally, your UPS should have an Output Watt Capacity 20-25% higher than the total power drawn by any attached equipment.

Choosing the right UPS for your customer

Runtime selection

Runtime refers to the amount of time a UPS will be able to power its attached equipment in the event of a power disruption. The more equipment you have plugged into your UPS, the less runtime you will have, so it's important to make sure your UPS is only providing back-up power to your most critical equipment.