



UPS SOLUTIONS

SDA 2 HOUR BACKUP REQUIREMENTS



DESIGN SPECIFICATION

- The SDA standard below requires 2-hour emergency backup in the event of a power outage for 2x GPO points in the participants bedroom and any automated doors for entry or egress.
- The **most suitable** emergency backup device to accommodate the requirements is a **UPS system**.

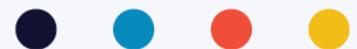
CLAUSE	DESIGN REQUIREMENT	RATIONALE	APPLICABLE TO
22.1	Emergency power solutions shall be provided to cater for a minimum 2-hour outage in no less than 2 double GPOs in participant bedrooms and any provided automated doors that are used for entry or egress.	Backup for life support systems if needed by participants.	



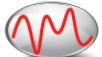
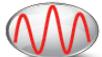
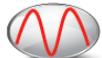
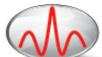
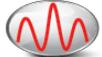
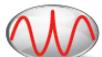
TYPES OF EQUIPMENT THAT MAY REQUIRE REDUNDANT POWER

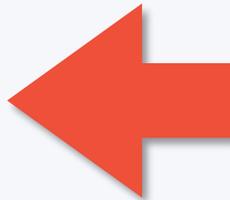
Ventilator	CPAP Device
Ceiling Hoist	Door Controllers
Emergency Notification Alarm	Suctioning Equipment
Electric Bed Controls	Small Fridge For Medication
Alternating Air Mattress	Communication Devices

- Air-conditioning is typically not factored into the design load, however, the two-hour capacity provides a participant who is reliant on heating and cooling enough time for support services to organise transportation to a hospital.



UPS SYSTEM CLASSES

UPS SOLUTIONS	VOLTAGE PHENOMENON	TIME	E.G.	IEC 62040-3	UPS SOLUTION
1	OUTAGE - BLACKOUTS	> 10 ms		VFD Voltage + Frequency Dependant	Classification 3 OFFLINE
2	SAGS / BROWNOUTS	< 16 ms			
3	DYNAMIC UNDERVOLTAGE	< 16 ms			
4	UNDERVOLTAGE	Continuous		VI Voltage Independant	Classification 2 LINE / INTERACTIVE
5	OVERVOLTAGE	Continuous			
6	LIGHTNING	Sporadic		VFI Voltage + Frequency Independant	Classification 1 (TRUE) ONLINE REAL DOUBLE CONVERSION
7	TRANSIENTS (SURGE)	< 4 ms			
8	FREQUENCY VARIATIONS	Sporadic			
9	VOLTAGE DISTORTION Hf (Burst)	Periodically			
10	VOLTAGE HARMONICS	Continuous			



IT IS HIGHLY RECOMMENDED TO CHOOSE AN ONLINE UPS SYSTEM TO PROTECT AGAINST ALL MAIN POWER ISSUES



PICKING THE RIGHT SIZE OF UPS SYSTEM

THERE ARE TWO CONSIDERATIONS WHEN PICKING THE RIGHT SIZE OF UPS:

1. UPS RATING (KVA/KW)

The total power load the UPS can handle from connected devices at any given time.

2. UPS RUNTIME

The battery amount and type required to provide 2-hour backup time for the UPS load in a power outage.





WHAT KW (KILOWATT) LOAD SHOULD BE ALLOWED FOR?

1. As a rule of thumb, **allow for the load of 1.5kW per participant** which is based on experience. However, the actual load per participant requires must be confirmed once they move in and all equipment can be tested.
2. It is recommended the UPS system that is installed can be **easily upgraded to a higher capacity** if needed by adding extra batteries.
3. The cupboard that the UPS is being installed into should have the capacity to **include space for the additional batteries and allow for the additional ventilation** that will be required.

UPS RATING CONSIDERATIONS:

- Total load from equipment being placed on UPS
- Automatic doors
- In-rush currents
- Potential misuse, people plugging items such as vacuums, hairdryers etc. that may trip the UPS circuit

UPS RUNTIME CONSIDERATIONS:

- Back-up time required
- Load on the UPS, if known. The more power, the more batteries required
- Scope runtime based on batteries at the end of life, not start of life
- Type of power required by equipment, constant or variable load



INSTALLING & COMMISSIONING THE UPS SYSTEM

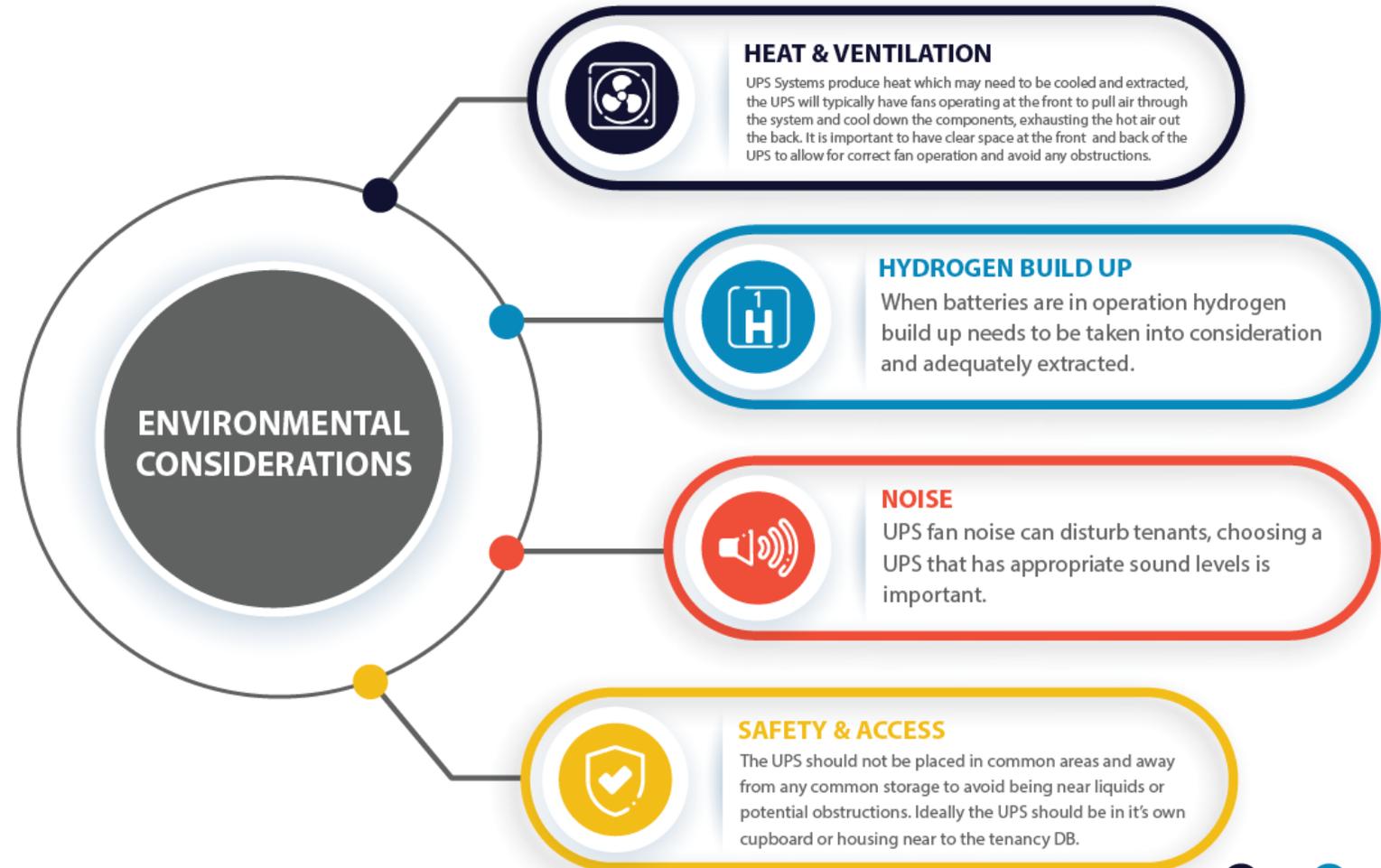
IT IS HIGHLY RECOMMENDED TO USE EXPERIENCED UPS INSTALLATION PROFESSIONALS TO AVOID ANY DAMAGE AND WARRANTY ISSUES TO HARDWARE AND IN ORDER TO TEST PROPER OPERATION OF THE SYSTEM.

- It is common for the electrician to provide the **electrical circuits, input and output** as needed, ready for the UPS installer to terminate into the UPS system, and commission the device.



ENVIRONMENTAL CONSIDERATIONS

THE TEAM SCOPING AND DESIGNING THE UPS NEED TO TAKE INTO CONSIDERATION ENVIRONMENTAL FACTORS SUCH AS:





SERVICE REQUIREMENTS

GENERAL SERVICING

- It is recommended to service the UPS every **6-12 months** should the UPS environment be optimal
- Service more frequently if there is heavy dust and debris clogging up UPS fans or heavy usage from local power problems
- Servicing should be performed by a **specialist familiar with the system**





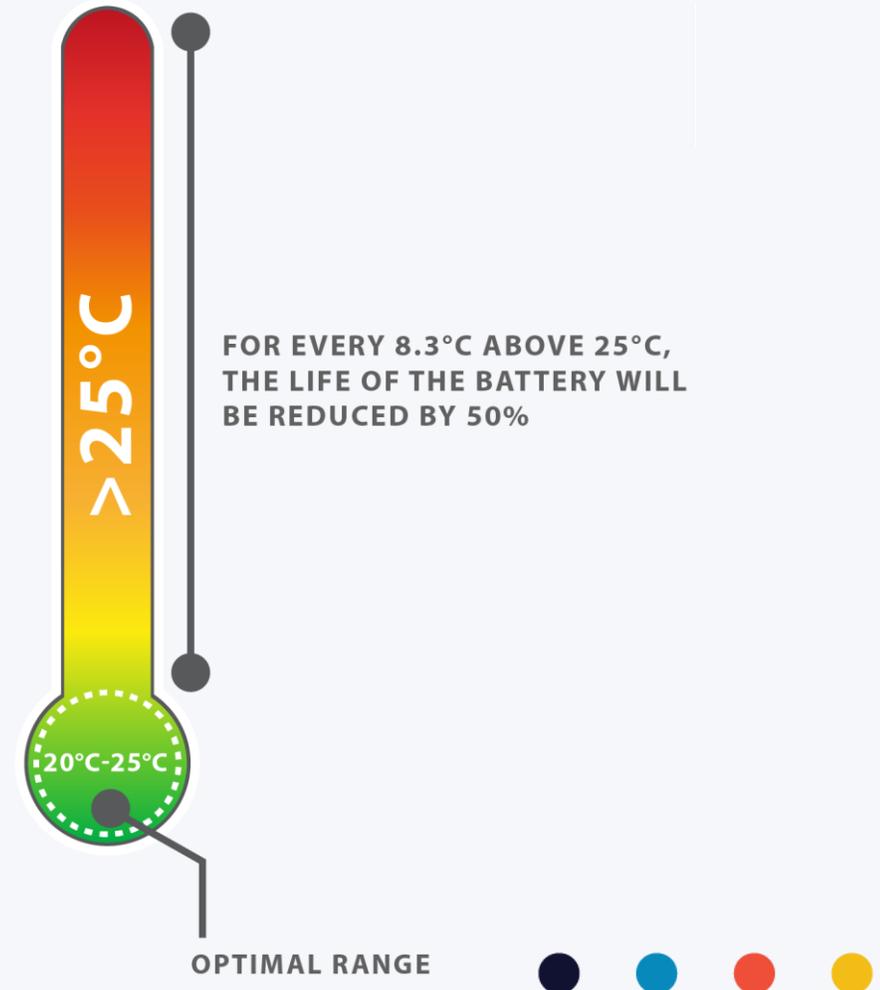
SERVICE REQUIREMENTS

BATTERY REPLACEMENTS

BATTERY REPLACEMENTS

Batteries are one of **main reasons for UPS damage and failure**. When a battery has exceeded its life expectancy it can reduce runtime and even the load, expand, leak and potentially be a fire hazard.

The optimal room temperature to get the most out of your battery is **25 degrees**, every 7 degrees higher you potentially lose approx. half the life expectancy.



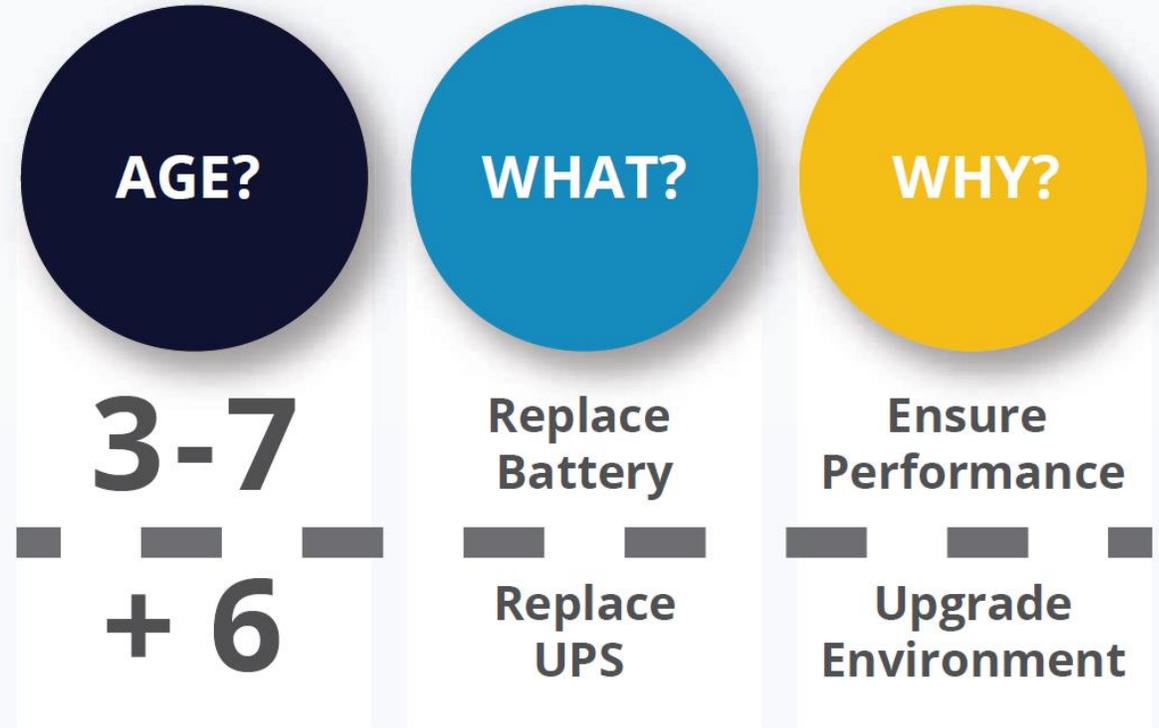


SERVICE REQUIREMENTS

BATTERY REPLACEMENTS

You will need to determine the design life of batteries in your UPS system. Most major brands all use (5) year batteries as standard, **UPS systems such as the UPS Solutions XRT6 use (10) year batteries standard at no extra cost.**

- **5 Year** batteries should be replaced between **3 - 4 years** to avoid damage and maintain uptime.
- **10 Year** batteries will last for the reasonable life cycle of the UPS and should be replaced along with the UPS replacement.



UPS LIFE EXPECTANCY

- ✓ The typical component design life of internal UPS components is 10 years.
- ✓ To avoid end of life faults and failures a UPS should be replaced around the 6-7 year mark.

UPS LIFE EXPECTANCY DETERMINANTS



**LOCATION
OF UPS**



**AMBIENT
TEMPERATURE**



**BATTERY
STATE & STORAGE**



**CYCLE
FREQUENCY**



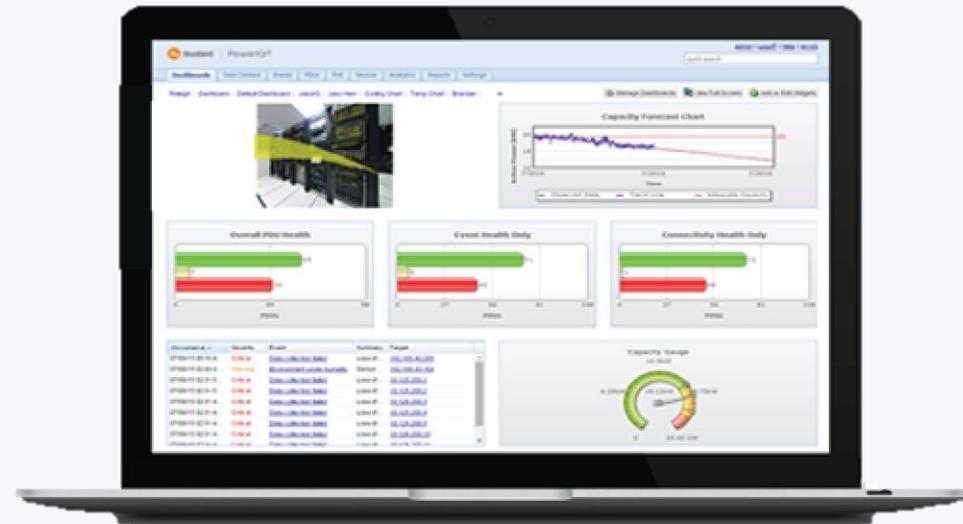
**REGULAR
MAINTENANCE**



**COMPONENT
DESIGN LIFE**

UPS MONITORING

- The **UPS can be monitored** by an appropriate party as long as there is a local network connection and a network card has been installed into the UPS.
- You will be able to **login and see the status of the UPS**
- You can set up an **email to SMS service** in order to **receive fault and failure alerts** to a nominated email account.



RECOMMENDED UPS SYSTEMS

THE NEW XRT6 ONLINE UPS SERIES

10 YEAR DESIGN LIFE BATTERIES AS STANDARD

NOW AVAILABLE!

[VIEW XRT6 RANGE](#)

10 YEAR
DESIGN
LIFE!



WE HAVE SUCCESSFULLY INSTALLED MULTIPLE UPS SOLUTIONS XRT6 ONLINE UPS SYSTEMS

The XRT6 UPS, along with additional battery packs, covers the SDA requirements and has 10-year design life batteries.

The XRT6 UPS range comes in various sizes, but the most common size taking into consideration all of the above recommendations has been the **6KVA UPS** with multiple battery packs.



CAN RESIDENTIAL SOLAR STORAGE BATTERIES BE USED FOR MEDICAL DEVICES?

- **The simple answer to this is no**, especially if the batteries are also used for general house power. Whilst not stipulated in the SDA Design Standard, **a UPS for SDA should be medical grade** because its role is to maintain life safety equipment.
- A shared house **battery that is solar** charged and also provides general power for the house **cannot be controlled to maintain the required two hours** of storage for participants.
- If the battery is for the sole use of a redundant power supply then there is no need for solar to be provided as **once the batteries are charged they will not be drained unless there is a power failure.**



WHAT IS A UPS SYSTEM?

A UPS System or Uninterruptible Power Supply is a battery backup system that provides surge protection, power filtering and instantaneous power to connected equipment, without interruption, in the event of a power outage.

A UPS PERFORMS THREE BASIC FUNCTIONS:

1.



Protects against common power issues and work to regulate your power supply

2.



Prevents data loss and facilitates graceful system shutdown

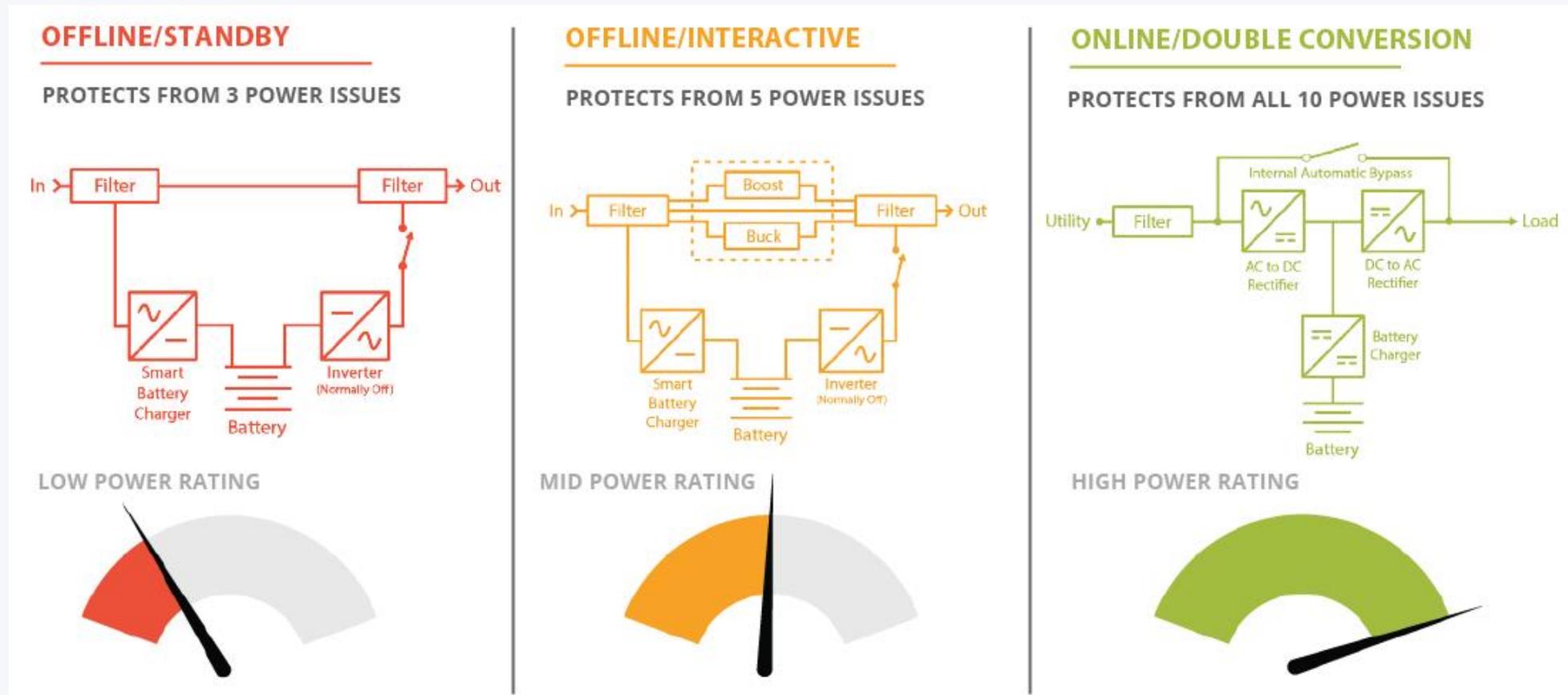
3.



Provide availability and power backup in the event of an outage

HOW TO PICK THE RIGHT UPS SYSTEM?

The first step is to pick the topology type, there are three main UPS topologies:





PREWIRING FOR HIGH PHYSICAL SUPPORT WITHIN A FULLY ACCESSIBLE DWELLING

- **Spatially a High Physical Support (HPS)** dwelling is the same as a **Fully Accessible (FA)** dwelling with wider doors and some additional fit-out requirements.
- Because of this, we recommend to clients to design them as HPS and fit them out as FA but prewire for future adaption i.e. for intercom, home automation and for the required 2 Hour Backup as it is a lot easier to provide at construction than to retrofit.
- **The UPS bypass can be fitted in the base build and UPS installed quickly requiring no hard electrical wiring, this minimizes time on site and inconvenience to tenants.**

The following slides contain wiring diagrams that illustrate what is required at the initial prewiring stage and then at UPS fit off.





UPS INPUT AND OUTPUT FEEDS

INPUT FEED

- ✓ UPS system needs to be on it's own isolated input power supply.
- ✓ Separated from common feeds to avoid interference on the UPS power circuit.
- ✓ This circuit should be clearly marked as the UPS input breaker, and easily identifiable.
- ✓ For breaker and cable ratings please refer to the UPS manufacturer's installation guidelines.

OUTPUT FEED

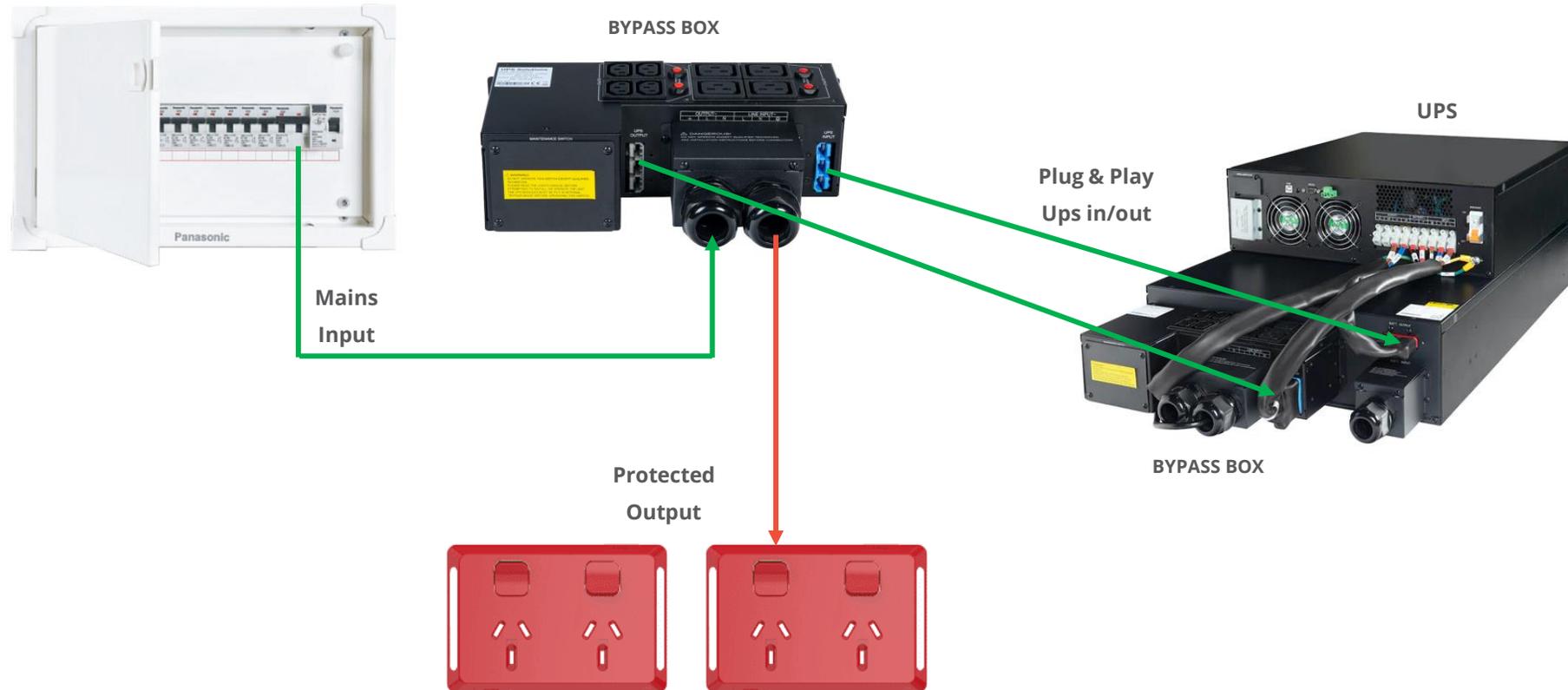
- ✓ The most common way to provide UPS power to equipment is to have a small UPS sub board fed from the output of the UPS.
- ✓ Strictly have only the 2x GPO feeds from the participants bedroom, automated doors, and external UPS exhaust fan.
- ✓ The output circuits & GPO's being fed from the UPS should be clearly marked and easily identifiable.
- ✓ We recommend placing signage on or near to the GPO's stating something to the likes of **"UPS Power: Critical Devices Only"**.

BYPASS BOX

- ✓ It is recommended a bypass panel is installed for the UPS - this will bypass the UPS feed to mains power in the event of UPS maintenance or failure.
- ✓ Some UPS systems like the one recommended at the end of this article come with a bypass switch built in.
- ✓ **The UPS BYPASS BOX can be fitted in the base build and UPS installed quickly requiring no hard electrical wiring, this minimizes time on site and inconvenience to tenants.**

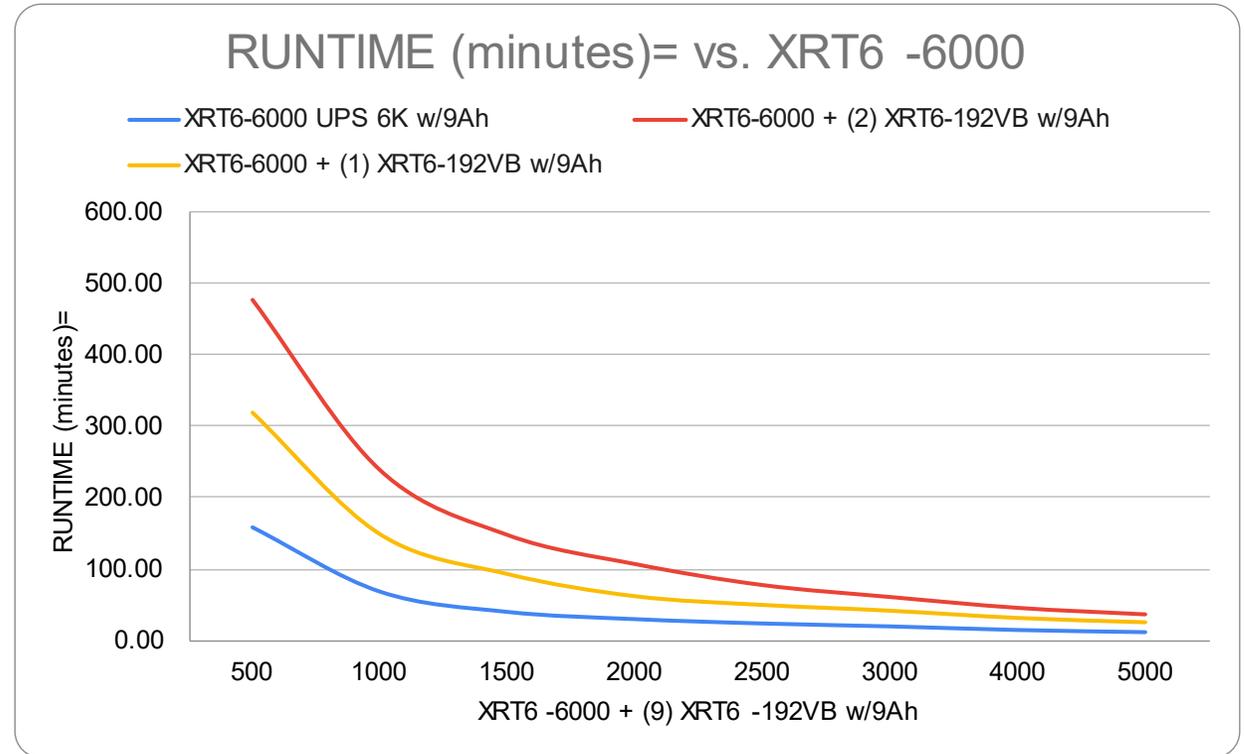
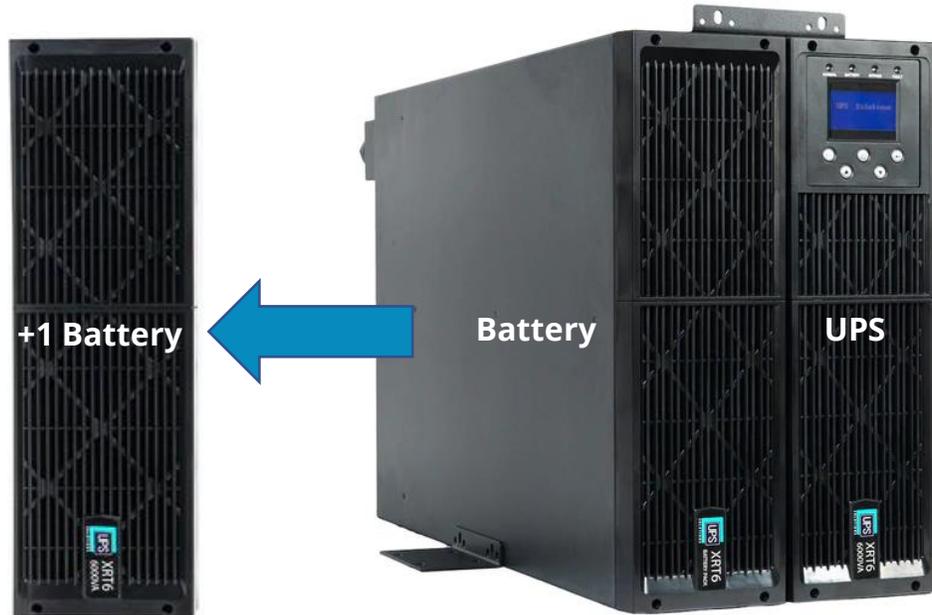


WIRING FOR HIGH PHYSICAL SUPPORT WITHIN A FULLY ACCESSIBLE DWELLING



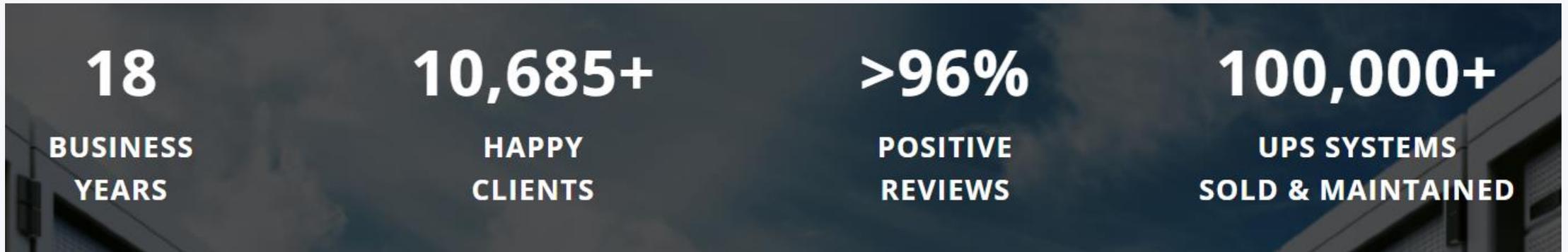
UPS Battery Runtime

1 Battery module





ABOUT UPS SOLUTIONS



- UPS Solutions is an **Australian owned** business that has been in business for over 18 years.
- To date, UPS Solutions has proudly sold and maintained over **100,000 UPS systems** in the Australian market and we are proud of our on-going success.
- As a **government accredited** provider of high quality power protection systems & services, we pride ourselves in being one of the longest lasting, full service UPS systems provider in the business.





SOLUTIONS

NSW | VIC | QLD | ACT | SA | WA

- ✓ National Field Service Team
- ✓ 18+ Years of Power Quality
- ✓ Government Accredited

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 1300 555 992

 (02) 4044 0116

 SALES@UPSS.COM.AU

 WWW.UPSSOLUTIONS.COM.AU

