



INTELEPOWER Industrial Energy Storage

The Intelepower BESS range of products are industrial scale Battery Energy Storage Systems (BESS) offered by Century Yuasa utilising the globally recognised and reliable range of batteries from GS Yuasa.

The Intelepower BESS systems are a modular solution and can also be scaled to meet your requirements. These BESS systems are suitable for:

- Peak shaving
- Providing smooth base load power with renewable energy sources
- Power factor correction
- Demand management
- Network upgrades and management

These Australian designed and manufactured systems can be easily incorporated into an existing electrical network at either LV or HV and the control systems can be easily integrated into an existing energy management system. The control system architecture is flexible so that the supplied module can work in any available mode the customer chooses.

The modular arrangement enables multiple kiosks to be connected to a single bus to build up the desired system capacity. The system has been designed in Australia to meet Australian Standards (and the harsh environment), and installed/commissioned as per Australian safe work practices.

Battery Choice

At Century Yuasa, we believe a BESS solution needs to deliver on both the technical expectations and positive return on investment for our clients. That is why our Intelepower BESS systems are available in Advanced Nano-Carbon Valve Regulated Lead Acid (AVRLA) or Lithium-Ion (Li-ION) solutions. Our batteries deliver industry leading performance with genuine specifications. The ideal battery choice will depend upon the following;

- Energy usage - high power Vs high energy application
- Space
- Cost of installation
- Return on investment
- Life and cycle times of the battery

With the Intelepower BESS systems providing a choice of a AVRLA or Lithium-ION solution, the client can choose the ideal outcome for their energy needs to meet their long term goals.

Features

Typically, each modular building/kiosk includes the following:

- Batteries
- Inverter
- AC and DC distribution
- Fire protection system(where required)
- Security
- HVAC
- Control System
- Additional Grid protection requirements as per utilities (optional)

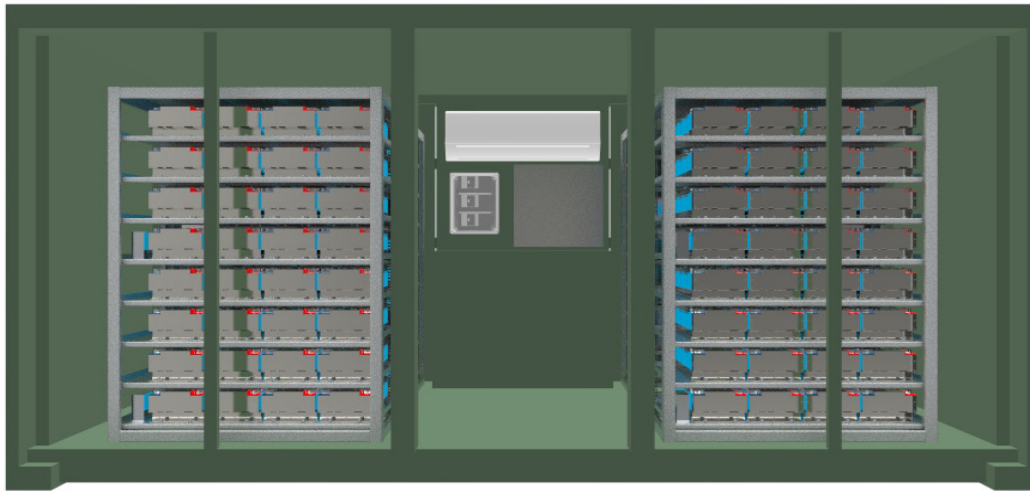
These modular kiosks can be connected to a single bus in a 3 phase ungrounded system using an external isolation and/or step up transformer. The benefits of this system design are:

1. A single transformer can be connected for multiple parallel kiosks, hence flexibility in choosing network architecture and reduced investment,
2. The isolation transformer also provides isolation from DC and harmonics penetration,
3. Providing independence in connecting to a different voltage level.

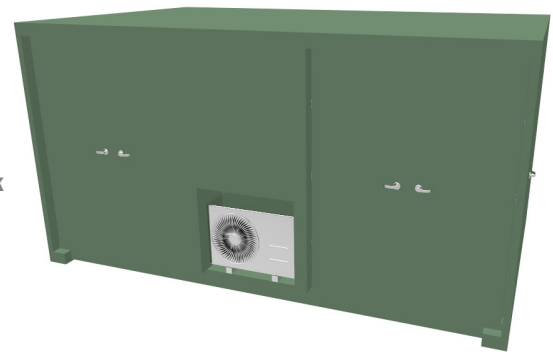
Intelepower BESS systems can also be interfaced to an existing energy management system or equivalent using various protocols (Modbus, DNP3, IEC61850 etc.) optimising integration with existing assets.

Every BESS modular kiosk system comes with the entire suite of safety features and does not require any additional protection to be supplied by the client:

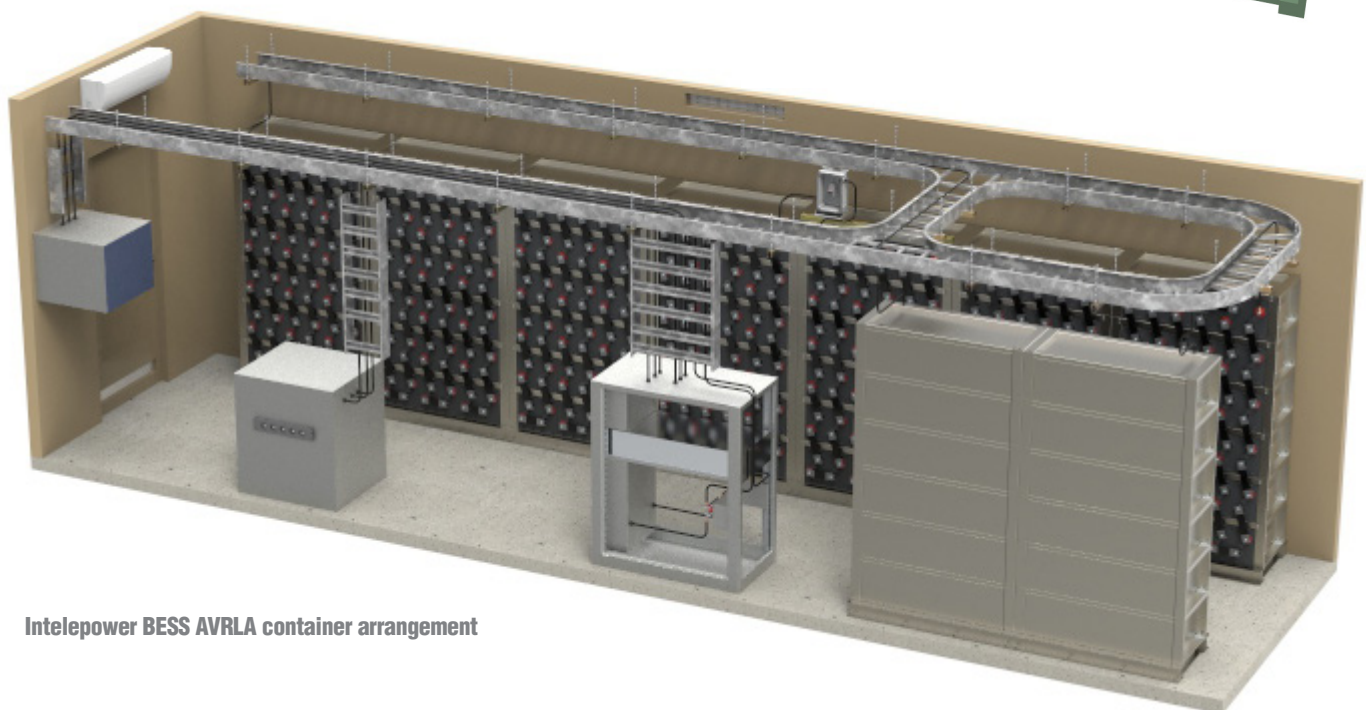
- Overcurrent
- Overload
- Ground fault detection
- Over voltage
- Temperature
- Security
- Battery fuses
- Fire protection



Intellepower BESS Lithium-Ion shortform container configuration



Intellepower BESS Lithium-Ion Kiosk



Intellepower BESS AVR/RA container arrangement

Applications

Renewable energy integration

Intelepower BESS systems can be integrated with intermittent renewable energy sources to provide consistent power in micro-grid applications.

Peak Shaving

With the changes to tariff structures, companies are struggling with high network charges for peak power usage. The time frame of this peak power usage may vary from client to client. The Intelepower BESS system, with or without a renewable energy source, can be designed to suit individual needs to store energy at off-peak and discharge energy during peak times, reducing peak demand charges and maximising return on investment.

Power Factor Control

With power factor control being a major problem with the penetration of non-linear systems, many customers are spending capital on addressing the issues and to reduce high network charges. The added benefit of Intelepower BESS systems is that they can also be operated as a power factor correction system. Having a power factor control range between -1 to 1 means that the customer is able to have real flexibility with regards to managing their power quality and reducing network charges.

Emergency power for various purposes

The transportable modular kiosk design allows the system to be installed at a site where a planned outage is occurring to supply emergency power. The system can be used to restore energy for the duration of an outage, with low visual and audible impact, then relocated.

Investment deferment (Frequency Controlled Ancillary Services)

With changes to load profile and the presence of intermittent energy sources the utilities are experiencing short term high demand, meaning expensive upgrade to their supply system. By placing Intelepower BESS systems at appropriate locations, these investments can be deferred or eliminated at a fraction of the cost.

Additional Support

The engineering team at Century Yuasa is available to provide additional services to ensure safe and reliable installation and operation of the BESS system:

- Assess standards to ensure the BESS system does not compromise on policies, procedures and existing protection and control systems,
- Provide engineering support for integration with existing energy management system,
- Liaise, develop, execute and manage network connection agreement to connect BESS systems,
- Provide and/or modify existing protection and control schemes.

Customers with specific energy storage system requirements can work with the Century Yuasa engineering team to assess and audit site and project requirements. With an unbiased opinion regarding the correct chemistry choice of batteries between VRLA or Li-Ion batteries, and typically being technology agnostic, you can have confidence that we will

Module Specification - Lithium-ION

The Century Yuasa range of LIM series Lithium-ION rechargeable batteries are used globally for industrial applications, including railway, telecommunication and stationary energy storage systems. The LIM battery has earned an excellent reputation based on its performance, technology and reliability. A Lithium-ION based BESS system may be suitable for high power lower energy applications with space constraints.

Intelepower BESS specifications in the Lithium-Ion range can be tailored to individual requirements due to the modular engineering of the system. The following kiosk configurations can be connected in parallel to meet specific capacity requirements.

The 2 modular configuration types are:

1. 80kW/160kWh (PN: 336330)
2. 80kW/240kWh (PN: 336331)

System Configuration	80kW/160kWh	80kW/240kWh
Total Rated Maximum Real Power at Output to Bus kW	86	86
Total Maximum Reactive Power at Output to Bus kVA	84	84
Max Power Input to System from Bus kVA	90	90
Max Overload Power Output to Bus kVA	132.5 for 1 Min	132.5 for 1 Min
Deliverable Power Factor Range	1 to -1	1 to -1
System Output Energy (Start Of Life) kWhr (useable capacity)	196	245
System Output Energy (End Of Life) kWhr (useable capacity)	137	171
Energy Delivery Time mins	120	180
Nominal temperature at which the ratings are given	25°C	
DC Nominal Voltage (Vdc)	710	
AC Input/Output Voltage Vrms	380-415V (Settable)	
Earthing	Fully Floating	
Isolation Transformer	Not Included	
Battery Technology	Li-Ion NMC	
Module	LIM50ENA-12	
Approx Cycle Life at 100%DOD (to 70% Capacity)	5500	
Approx Cycle Life at 50%DOD (to 70% Capacity)	11000	
Approx Cycle Life at 25%DOD (to 70% Capacity)	33000	
Approx Calendar Life (to 70% Capacity at EOL)	10yrs	
System (AC - AC) Round Trip Efficiency %	87	
Standards	AS3000, AS3011, AS2676, AS61800-3, ISO9001, ISO14001, IEEE1547, UL1741, JISC8715	
System Operating Temperature Range	0°C to 40°C	
Dimension	2500(W) x 3920(D) x 2000(H) Approx	

Module Specification AVRLA

Century Yuasa's advanced nano-carbon battery technology achieves superior deep cycle life and is deployed in high capacity cyclic cells for a variety of large energy storage applications. The modular unit design provides easy installation and reduced site footprint. Modular unit construction has front facing terminals for easy maintenance, even in large energy storage solutions.

An Advanced VRLA BESS system may be suitable for high energy lower power applications and is suitable for sites where space isn't an issue. The long life of AVRLA (>15 years) will also make it ideal for better return on investment.

Intelepower BESS systems for AVRLA can be tailored to individual requirements easily due to the modular engineering of the system. Each modular building can be connected in parallel to meet specific capacity requirements.

The AVRLA modular systems are:

1. 40kW/160kWh (PN: 336310)
2. 80kW/320kWh (PN: 336311)

System Configuration	40kW/160kWh	80kW/320kWh
Total Rated Maximum Real Power at Output to Bus kW	40	86
Total Maximum Reactive Power at Output to Bus kVA	38	84
Max Power Input to System from Bus kVA	45	90
Max Overload Power Output to Bus kVA	132.5 for 1 Min	132.5 for 1 Min
Deliverable Power Factor Range	-1 to 1	-1 to 1
System Output Energy (SOL) kWhr (useable capacity)	170	340
System Output Energy (EOL) kWhr (useable capacity)	136	270
Energy Delivery Time mins	240	240
Nominal temperature at which the ratings are given	25° C	
DC Nominal Voltage (Vdc)	648	
AC Input/Output Voltage Vrms	380-415V (Settable)	
Earthing	Fully Floating	
Isolation Transformer	Not Included	
Battery Technology	Advanced VRLA	
Module	SLR500	SLR1000
Approx Cycle Life at 100%DOD (to 70% Capacity)	5000	
Approx Cycle Life at 50%DOD (to 70% Capacity)	5500	
Approx Cycle Life at 25%DOD (to 70% Capacity)	5500	
Approx Calendar Life (to 80% Capacity at EOL)	15yrs	
System (AC - AC) Round Trip Efficiency %	89	
Standards	AS3000, AS3011, AS2676, AS61800-3, ISO9001, ISO14001, IEEE1547, UL1741, JISC8715	
System Operating Temperature Range	0°C to 40°C	
Dimension	2440(W) x 6000(D) x 2900(H) Approx	2440(W) x 9000(D) x 2900(H) Approx

About Century Yuasa

Overview

Standby Power Division is a group within CenturyYuasa that provides energy storage, DC power electronics and uninterruptible power system designs and manufacturing for industrial applications.

Since 1991, this group has evolved to become a preferred contractor to a diverse range of clients operating large capital network infrastructures. These networks include clients operating within the telecommunications carrier, electricity, rail and water industries, where reliability of power for critical applications is paramount.

Recognised as a leading supplier of DC power and UPS systems in the Australian market, Century Yuasa has maintained its ISO certification for the design, manufacture, support and installation of power solutions for over two decades delivering quality assets that do not fail.

Our product offerings are broadly classified into several brands:

Intelepwer Engineered power systems, design and construct services and ongoing maintenance programs.

Yuasa An industrial range of battery technologies designed to JIS / IEC standards with capacities from 38Ah to 3000Ah.

Design Services

Designing power systems requires a broad understanding of possible electrical topologies, limitations of components used within a design and issues of standards compliance. Century Yuasa offers specialized personnel specifically for the purpose of engineering design and documentation of power systems. These services can be provided as an integrated part of a project solution, alternatively they can be procured separately.

This gives our clients the option of requesting a complete end-to-end solution, staged or segmented delivery or simply just to update existing systems.

With certified quality management procedures and dedicated resources, Century Yuasa has the experience and facilities to provide design, construct and documentation packages for all power systems which are commercially viable, technically accurate and industry compliant.

Our Capability

Century Yuasa's expertise lies in the engineering of new power systems, upgrades to installed systems and the evaluation and maintenance of existing power systems. Our depth of knowledge and extensive experience allows for the formation of technically sound solutions that aim to provide the lowest possible 'life cycle' cost while applying the principles of:

- **Compliance** Consistently supplying products or services that apply all necessary industry standards and regulatory requirements.
- **Knowledge** Providing commercial and technical proposals which are based on established practices of uninterruptible power design, construction and maintenance to meet clients' specifications.
- **Integrity** The delivery of a complete and balanced offer that combines the principles of compliance and knowledge.

At Century Yuasa, we take your health and safety seriously with all our products and services delivered to the best standards available.

- **Certified ISO14001 Environmental Management**
- **Certified ISO9001 Quality Management**
- **Certified AS/NZS 4801 Safety Management System**
- **All National Standards and best practices**

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An affiliated business of the GS Yuasa Corporation, CenturyYuasa has an 80+ year history of supplying a range of stored energy solutions to the Australian market. An established network of sales and distribution offices throughout Australia and New Zealand has seen the business gain the trust and respect from its customers by focusing on quality products and exceptional customer service.

The portfolio within CenturyYuasa includes a wide range of stored energy products and services, as well as identifiable brands and unique technologies for the automotive, materials handling and standby power applications. Directly maintaining and operating several manufacturing centres in Australia and employing some 650 people, CenturyYuasa continues to be Australia's enduring manufacturer of stored energy products.

