

## PowerCache® – S (91 kVA / 125 kWh) Datasheet

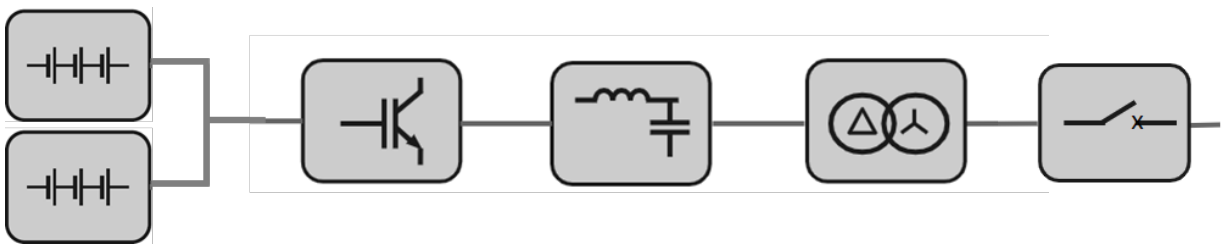
### PowerCache® – S: Grid-in-a-Box

PowerCache is a utility-grade grid in a box. It enables operators of ultra-fast EV charging, commercial or industrial sites, microgrids and communities to provide an unconstrained power user experience on a constrained network. This versatile power system combines a robust, ultra-rapid-response power converter/ controller and a high-performance battery with intelligent microgrid control. PowerCache is expandable and integrates with other systems on-site. It can participate in ancillary services markets.



System Performance	
Nominal frequency and voltage	47Hz ... 53Hz, 415V or 400V +10%/-6%
Grid connection	3-phase+N, YNd transformer-coupled
Active and reactive power rating	$S_{Nom} = 91 \text{ kVA}$ - 4-quadrant P&Q, symmetrical apparent power
Maximum continuous load	3-phase: $S_{Nom} = 91 \text{ kVA}$ , single phase: $S_{Nom}/\sqrt{3}$ (other phases not loaded)
Permissible phase load imbalance	Unlimited within the rating per phase +/-
Inverter base electrical function	<ul style="list-style-type: none"> <li>• Current source (on-grid)</li> <li>• Emulated synchronous machine (ESM) (on- &amp; off-grid, various modes)</li> </ul>
Harmonics	Compliant with AS4777.2
Step load capability (islanded or UPS)	Instantaneous load swing up to 220% $S_{Nom}$ (absorbing to injecting)
Response time to external signal	< 50 ms
Primary frequency control step response – rise time / settling time	User definable via generator time constant and frequency PID control, typically: 150 ms / 1500 ms
System overload capability	400% instantaneous, 200% for 2 s, 150% for 1 minute in 10 minutes
Fault current capability	Fault current settable up to 200% $I_{Nom}$ (3-phase) and 340% (1-phase) for 2 s
AC protection concept	Inter-tie protection of BESS and site mains or generation points of isolation
AC protections	Over/under current/voltage/frequency, RoCoF, VVS, negative sequence voltage, sync-checks, anti-islanding to AS4777
Application-level protections	Over/under SoC, sustained overvoltage, protection consistency checks, application alarms, safe states, etc, via the PaDECS® control system
DC protection	Insulation monitoring, overcurrent/voltage, Battery OEM protections
System AC-AC round trip efficiency	>89% for a typical application scenario.

Battery Performance	
Total DC energy / usable energy	156 kWh / 125 kWh at 1C (dis-)charge
Battery chemistry	NMC cathode, $\text{LiNi}_x\text{Mn}_y\text{Co}_z\text{O}_2$ , pouch cell structure
Indicative battery cycle life / full cycle equivalents (FCE)	4,000 FCE at 90% DoD to 70% capacity retention; or 5,000 FCE at 80% DoD to 70% capacity retention
Battery calendar life	>13 years
Battery Protection	Cell-, rack- and system-level supervision, control and protection of current, voltage, power, SoC, SoH, temperature, imbalances, insulation

<b>Interface</b>				
Web-API	Web-API via VPN			
SCADA	Modbus TCP or discrete hardwired alarms and E-Stop			
System HMI	GUI web application via VPN			
Local data Historian Client	Logging all system features, parameters, modes and actuals, access via VPN			
Cloud-Client GUI and API	Cloud-Client GUI and API via PaDECS@-Cloud (SaaS)			
<b>Mechanical - Inverter Cabinet Half</b>				
Fire mitigation	Smoke & heat detection			
Cabinet cooling	Forced air cooling, air inlet: large impeller & pleat filter assembly			
Cabinet structure	Single-walled, lined with heat & noise protective foam			
Dimensions and Weight	Height x Width x Depth = 1,900 mm x 1,240 mm x 850 mm, 1,300 kg			
<b>Mechanical - Battery Cabinet Half</b>				
Fire mitigation	Novec® gaseous fire suppression system with detector tube			
Battery Enclosure Cooling	HVAC split cycle air cooled via door coolers			
Cabinet structure:	Double-walled			
Dimensions and Weight	Height x Width x Depth = 1,900 mm x 1,240 mm x 960 mm, 1,900 kg			
<b>Environmental</b>				
Humidity	5% to 100% outside, 5% to 95%, non-condensing inside cabinet			
Altitude	Up to 1,000 m without derating			
Operating ambient temperature	0 – 40° C without derating, -20 – 50° C max (inverter), 0 – 45° C (sustained, battery)			
Noise (max. @ 1 m distance)	<65 dBA (excluding compressor) <70 dBA (compressor on)			
IP Rating	IP54 (inverter cabinet-half), IP55 (battery cabinet half)			
<b>Compliances include:</b>				
AS/NZS 4777.2:2020	The inverter/filter assembly is AS4777.2 certified. Cert No.: SAA192864			
AS 5139	Safety of battery systems for use with power conversion equipment			
IEC 61000 (Part 3), EN 61800	EMC emission limits			
AS 3000	Electrical wiring rules			
<b>System Configuration</b>				
				
Batteries	Inverter	LC Filter	Transformer	Switchgear
<b>Contact</b>				
Power Technology Engineered Solutions Pty Ltd Unit 18/25 Cook Road Mitcham 3132, Australia <a href="http://power-tec.com.au">power-tec.com.au</a>				