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|---|-------------|------|---|--------------|--------------|
|  |             |      | Title   |              |              |
|   |             |      | System Interface Specification<br>(PS040-907) |              |              |
|   | RESPONSIBLE | DATE | SIZE  | DOCUMENT NO. | REV          |
| AUTHORS   |             |      | A4  | P400-5058    | 00           |
| USER  |             |      |   |              |              |
| RELEASE   |             |      | MANUAL CHANGE PROHIBITED                      |              | SHEET 1 OF 4 |

# *System Interface Specification*


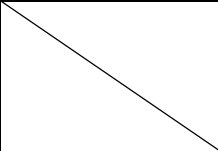
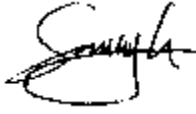
**PS040-907, 39.95kWh ESS**

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# 1. Battery System Parameters

Specific parameters for the battery system blocks are detailed in the chart below

| Parameter                      | Units   | Specification | Note   |
|--------------------------------|---------|---------------|--|
| Cell                           | Ah      | 25            | SPB58253172V3  |
| Series                         | n/a     | 216           | One rack   |
| Parallel                       | n/a     | 2             | One rack   |
| <b>Cell Voltage</b>            |         |               |  |
| Max                            | V       | 4.2           | At 100% SOC  |
| Nom                            | V       | 3.7           | At 50% SOC   |
| Min                            | V       | 3.0           | At 0% SOC  |
| <b>Cell Capacity</b>           |         |               |  |
| Rated                          | Ah      | 25            | From cell specification  |
| <b>Battery Configuration</b>   |         |               |  |
| Cell Modules                   | Modules | 18            | Each cell module contains 24 cells (12s2p)   |
| <b>Battery Capacity (BOL)</b>  |         |               |  |
| Theoretical                    | Ah      | 50            | Calculated based on cell capacity  |
| Rated                          | Ah      | -             | Estimated when 1C rate is used to determine capacity; current taper applied at end of charge |
| <b>Battery Capacity (EOL)</b>  |         |               |  |
| Theoretical                    | Ah      | 35            | Estimated at 70%   |
| <b>Battery Voltage</b>         |         |               |  |
| Max                            | V       | 907.2         | Determined at maximum cell voltage   |
| Nom                            | V       | 799.2         | Determined at nominal cell voltage   |
| Min                            | V       | 583.2         | Determined at minimum cell voltage   |
| <b>Battery Energy</b>          |         |               |  |
| Theoretical                    | kWh     | 39.95         | Calculated value based on theoretical system capacity  |
| Rated                          | kWh     | -             | Calculated value based on rated system capacity  |
| Usable (typical)               | kWh     | -             | Estimated energy between 20% and 80% SOC, de-rated specific to system application            |
| Usable (max)                   | kWh     | -             | Estimated energy between 8% and 90% SOC, de-rated specific to system application             |
| <b>Battery Discharge Power</b> |         |               |  |
| Continuous                     | kW      | 11.98         | At nominal system voltage (15A*799.2V)   |
| Max                            | kW      | 39.96         | At nominal system voltage (50A*799.2V)   |
| Peak                           | kW      | -             | At nominal system voltage (system/cell peak, duration less than 1.0s) :                      |
| <b>Battery Charge Power</b>    |         |               |  |
| Continuous                     | kW      | 11.98         | At nominal system voltage (15A*799.2V)   |

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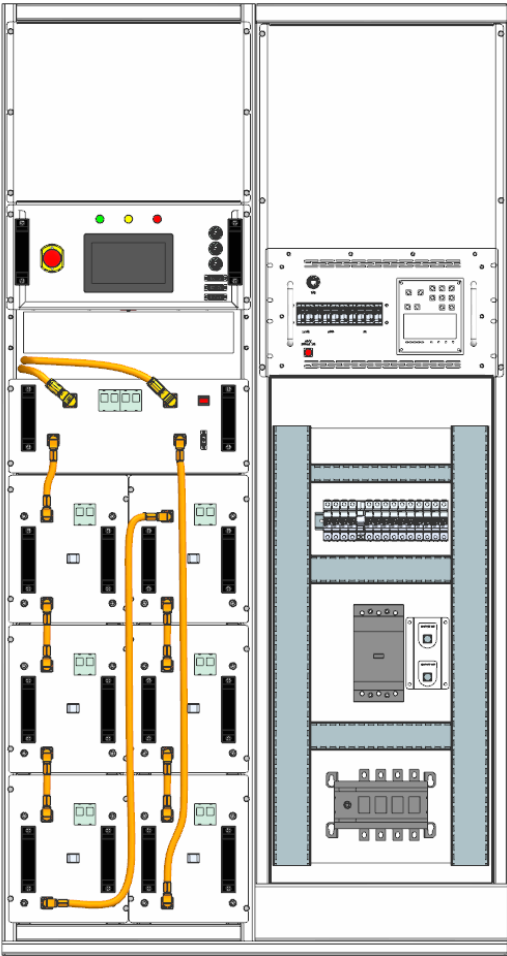
| Parameter                             | Units      | Specification      | Note   |
|---------------------------------------|------------|--------------------|--|
| Max                                   | kW         | 39.96              | At nominal system voltage (50A*799.2V)   |
| Peak                                  | kW         | -                  | At nominal system voltage (system/cell peak, duration less than 1.0s) :        |
| <b>Battery Discharge Current</b>      |            |                    |  |
| Continuous                            | A          | 15                 | Continuous between 20% and 100% SOC, specific to system application            |
| Max                                   | A          | 50                 | Continuous between 20% and 100% SOC (system maximum continuous)                |
| Peak                                  | A          | -                  | Between 20% and 100% SOC (system/cell maximum surge, duration less than 10.0s) |
| <b>Battery Charge Current</b>         |            |                    |  |
| Continuous                            | A          | 15                 | Continuous between 0% and 80% SOC, specific to system application              |
| Max                                   | A          | 50                 | Continuous between 0% and 80% SOC (system maximum continuous)                  |
| Peak                                  | A          | -                  | Between 0% and 80% SOC (system/cell maximum surge, duration less than 1.0s)    |
| System Mass                           | kg         | 500                | Approximate calculated value (battery racks=360kg and One BCP rack=140kg)      |
| Battery Shelf Life                    | years      | 5                  | Continuous between 20% and 80% SOC   |
| Cell Balancing                        | Type       | Dissipative        | MLEC Temperature Diagnostics   |
| Thermal Management                    | Type       | Limit Controlled   | MLEC Current Limited above normal cell operating temperature                   |
| <b>Operating Temperature/Humidity</b> |            |                    |  |
| Max                                   | % RH       | 85                 | Range (cell min/max)   |
| Min                                   | % RH       | 45                 | Range (cell min/max)   |
| Max                                   | Degrees °C | 55                 | Zero Current Limited Above Max Operating Temp                                  |
| Min(Discharge)                        | Degrees °C | (-)20              | Zero Current Limited Below Min Operating Temp                                  |
| Storage Temperature                   | Degrees °C | (-)20 to 25 <1year | Range (cell min/max)   |
| Pre-Charge                            | Type       | Internal           | HV Load Capacitance protection   |
| GFD                                   | n/a        | Enabled            | MLEC Isolated Diagnostics  |
| EPO                                   | n/a        | Enabled            | Emergency Power OFF (interlock)  |

**Table 1 Product Technical Specifications**

|   |                          |              |              |
|---|--------------------------|--------------|--------------|
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## 2. Mechanical Drawings

Battery Rack 1      BCP Rack



| Item           | Width(mm ) | Depth(m m) | Height(mm) | Weight(kg ) |
|----------------|------------|------------|------------|-------------|
| Battery Rack 1 | 530        | 634        | 2000       | 360         |
| BCP Rack       | 530        | 634        | 2000       | 140         |

Figure 1 Pack Outline Drawing