

Description of the SDP System

Each SDP cabinet is configured with three power systems consisting of the following components:

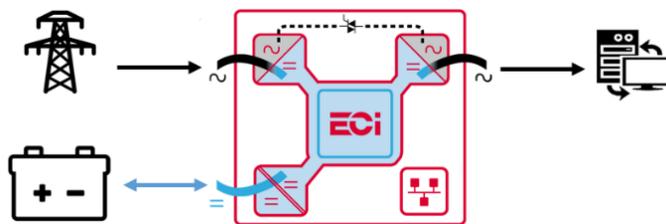
- CE+T Sierra 3PH Bidirectional Converter System
- CE+T Inview S Monitor
- Natron Sodium Ion 48VDC Battery Module

Each system operates independently from the each other in order to allow VPS to demonstrate their ability to route power as needed to the loads via their controlled distribution.

The CE+T Sierra systems are configured for 230/400VAC 3PH power and operate from a 48VDC battery. The Sierra system is fully bidirectional at each port allowing VPS to dynamically shift power as needed from the battery or grid to support the power demand by the load.

The Natron Sodium Battery Modules are configured in one, two, or three unit combinations with each set of Sierra Converters to demonstrate varying discharge rates among the three power systems.

There are two identical cabinets assembled for the deployment.



System Power Flow Diagram



SDP Platform Data

AC Input	230/400VAC 3PH, 4W+G
AC Output	230/400VAC 3PH, 4W+G
DC Battery	48VDC; Sodium Ion Battery (See Natron Data Sheet)
Max Possible Power Per System	36kVA/30kW
Configured Power Per System	18kVA/15kW
Max Planned Output Current	25A per System
Input/Output Cable	8AWG SOOW Cable 6' Whip (Top Cabinet Exit)
Input Connector	IEC 60309 Plug (x3)
Output Connector	IEC 60309 Receptacle (x3)
Cabinet Dimensions	24" Wide x 31.5" Deep x 84" High
Estimated System Weight	~750lbs

CE+T Sierra Module Data

Power	
AC Input Data	
Nominal voltage / Current	230 Vac / 11.7 A
Voltage range	150 - 265 Vac (De-rating from 185 to 150 Vac)
Brownout	1600 W @ 150 Vac / 2400 W @ 190 Vac linear decreasing
Power factor / THD	> 0.99 / < 3%
Frequency (Synchronization range)	50 Hz (47 - 53 Hz) or 60 Hz (57 - 63 Hz)
DC Input Data	
Nominal voltage (range)	48 Vdc (40 - 60 Vdc) ¹
Nominal current (at 48 Vdc and 2400 W output)	53.4 A
Maximum input current (for 15 seconds) / voltage ripple	66.8 A / < 10 mV RMS
AC Output Data	
Efficiency AC to AC (EPC) / DC to AC / AC to DC	> 96% / > 93.7% / > 93.7%
Nominal voltage ² (Adjustable)	230 Vac (200 - 240 Vac)
Frequency / frequency accuracy	50 or 60 Hz / 0.03%
Nominal Output power (VA) / (W)	3000 VA / 2400 W
Short time overload capacity	125% (15 seconds)
Admissible load power factor	Full power rating from 0 inductive to 0 capacitive
Total harmonic distortion (resistive load)	< 3%
Load impact recovery time (10% - 90%)	≤ 0.4 ms
Nominal current	13 A @ 230 Vac
Crest factor at nominal power	3 : 1 for load P.F. ≤ 0.7
Short circuit clear up capacity at AC input / On battery	109 A / 34 Arms for 20 ms
Short circuit current after > 20 ms	22.5A for 15 seconds
AC output voltage stability	±1% from 10% to 100% load
DC Output Data	
Nominal voltage (range)	53.5 Vdc (44 - 60 Vdc)
Maximum power	2.4 kW ³
Maximum current at 48 Vdc	50 A
Reverse polarity protection	YES
Efficiency AC to DC	> 93.7%
Max. Voltage interruption / total transient voltage duration (max)	0 sec / 0 sec