

## Quarterly Inspection Report

System Status: Normal

Customer	Site
Customer Address City State, Zip Contact Phone	Customer Address City State, Zip Contact Phone

<b>Project Number</b>	123456.7890	<b>Inspection Type</b>	Quarterly
<b>System ID</b>	9FW-BAT-D4	<b>Inspection Date</b>	April 04, 2017
<b>Technician(s)</b>	Technician	<b>Escort</b>	Escort

<b>Battery Manufacturer</b>	C&D	<b>System Type</b>	Rectifier
<b>Battery Model</b>	100LF29FR	<b>Number of Rectifiers:</b>	1
<b>Battery Rating</b>	1400 Ah	<b>Number of Strings</b>	1
<b>Battery Type</b>	VR-AGM	<b>Cells per String</b>	120
<b>Battery Rack</b>	Stack	<b>Total Number of Cells</b>	120
<b>Module Orientation</b>	Normal	<b>OCP Type</b>	Breaker
<b>Cell Labeling</b>	Cell 1 Most Positive	<b>OCP Rating</b>	800 Amps
<b>Internal Ohmic Meter</b>	BITE2		

<b>Site Load</b>	155 Amps DC	<b>Rectifier Redundancy</b>	N+0
<b>Est. Runtime</b>	7.2 Hours (de-rating 0.8)	<b>Rectifier Capacity</b>	600 Adc

<b>Ambient Temperature</b>	74 °F	<b>Charge State</b>	Float
<b>Controller Alarms</b>	None	<b>System Shunt</b>	N/A

### Corrective Action

No corrective action is required.

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## Readings Evaluation

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No readings are out of tolerance.

## Visual Inspection

	<b>Evaluation</b>	<b>Comment</b>
<b>Safety Placards</b>	Recommendation	Safety placards are recommended for all battery rooms.
<b>Eye-wash/Shower</b>	Recommendation	An eyewash is recommended for all battery rooms.
<b>Ventilation</b>	Ok	
<b>Fire Suppression</b>	Ok	
<b>Spill Containment</b>	Ok	
<b>Frame Ground</b>	Recommendation	A frame ground is recommended for all battery systems.
<b>Electrolyte Level</b>	N/A	
<b>Posts</b>	Ok	
<b>Connections</b>	Ok	
<b>Valves/Arrestors</b>	Ok	
<b>Catalyst</b>	Ok	
<b>Rack/Cabinet</b>	Ok	
<b>Covers</b>	Ok	
<b>Jars</b>	Ok	
<b>External Post Seals</b>	Ok	
<b>Internal Post Seals</b>	N/A	
<b>Positive Plates</b>	N/A	
<b>Negative Plates</b>	N/A	
<b>Sediment</b>	N/A	
<b>Torque</b>	Ok	
<b>Insulation Test</b>	Ok	
<b>Cell Pressure Test</b>	Ok	
<b>Thermography Test</b>	Ok	

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**Rectifier Information**

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<b>Status</b>	On-line
<b>Alarms</b>	None
<b>Meter Vdc</b>	270
<b>Meter Adc</b>	155
<b>Manufacturer</b>	HDR Power System
<b>Model</b>	CLC600-260V
<b>Serial Number</b>	xxxxx
<b>Rating</b>	600 Adc
<b>Type</b>	Ferro
<b>AC Input</b>	480V/3Ø

## Manufacturers Recommended Values

Min Ambient Temp.:	65
Max Ambient Temp.:	80
Nom E Set Point:	2.25
Min E Set Point:	2.23
Max E Set Point:	2.27
Nom String Voltage:	270.00
Min String Voltage:	267.60
Max String Voltage:	272.40
Voltage Temp. Corr.:	.0028
Nom Specific Gravity:	n/a
Specific Gravity Flag:	n/a
Internal Ohmic Type:	Resistance
Nom Int. Ohmic Value:	198
Internal Ohmic Scale:	uOhms
Internal Ohmic Flag:	30%
Max inter-cell drop:	30 mV
Max inter-tier drop:	100 mV
Inter-cell Baseline:	19
Inter-tier Baseline:	76
Battery Re-Torque:	100
Battery De-rating K:	.8
High Float K:	0.05 Amps DC per 100Ah
High Ripple K:	5 Amps AC per 100Ah

## Summary

*Voltages compensated for ambient temperature.*

	Nominal	Maximum	Minimum	Flagged High When	Flagged Low When	Flag Trigger
Ambient Temp.	77°F	80.0°F	65.0°F	> 80.0°F	< 65.0°F	> Maximum or < Minimum
String Vdc (74.0°F)	271.01 Vdc	273.41 Vdc	268.61 Vdc	> 273.41 Vdc	< 268.61 Vdc	> Maximum or < Minimum
DC Float Current	<=2.1 Adc	2.1 Adc	n/a	> 2.1 Adc	n/a	> Maximum
AC Ripple Current	<=70.0 Aac	70.0 Aac	n/a	> 70.0 Aac	n/a	> Maximum
Cell Vdc (74.0°F)	2.2584 Vdc	2.2784 Vdc	2.2384 Vdc	> 2.2784 Vdc	< 2.2384 Vdc	> Maximum or < Minimum, [Modus = Set Point]
Internal Ohmic	198 uOhms	257 uOhms	n/a	> 257 uOhms	n/a	30% > Nominal
Specific Gravity	n/a	n/a	n/a	n/a	n/a	n/a
Cell Temperature A	77.0°F	81.6°F	71.6°F	> 81.6°F	< 71.6°F	± 5°F from Average (76.6°F)
Cell Temperature B	77.0°F	79.0°F	69.0°F	> 79.0°F	< 69.0°F	± 5°F from Ambient (74.0°F)
Cell Temperature C	77.0°F	80.0°F	65.0°F	> 80.0°F	< 65.0°F	< or > Ambient Modeling
Inter-Cell Resistance	<= 19 uOhms	23 uOhms	n/a	> 23 uOhms	n/a	20% > Nominal
Inter-Tier Resistance	<= 19 uOhms	91 uOhms	n/a	> 91 uOhms	n/a	20% > Nominal

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**Battery String Readings**

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**String 1**

<b>Install Date</b>	2016
<b>String Voltage</b>	270.0 Vdc
<b>Float Current</b>	.64 Adc
<b>Ripple Current</b>	18.90 Aac
<b>Vdc Pos to Ground</b>	135.8 Vdc
<b>Vdc Neg to Ground</b>	135.1 Vdc
<b>Pos Termination R</b>	10 uOhm
<b>Neg Termination R</b>	10 uOhm
<b># of Battery Conductors</b>	3
<b>Battery Conductor Size</b>	350 MCM
<b>Ground Conductor Size</b>	2/O
<b>Vac Across String</b>	.676 Vac
<b>Vac Pos to Ground</b>	5.71 Vac
<b>Vac Neg to Ground</b>	5.74 Vac

## Battery Cell Readings

Internal ohmic values are shown in uOhms and were obtained using a BITE2 meter. Internal cell ohmic values designated with 'OS' are off scale.

Cell temperatures were obtained at the negative post with an infrared thermometer.

Connection resistance readings are shown in uOhms. The connection resistance for a given cell represents the resistance of the connection between that cell and the next. A reading suffix of 'IT', 'IR', 'SH', or 'SW' indicates inter-tier connection cables (IT), inter-rack connection cables (IR), shunt equipped connections (SH), and switch equipped connections (SW).

Not all readings are applicable to all battery types or inspection types.

### Cell Summary

	Voltage	uOhms	Specific Gravity	Temperature	Inter-Cell R	IT/IR/SH/SW R
Average	2.261	180		76.6	15	75
Minimum	2.24	165		76.0	11	73
Maximum	2.27	199		77.0	19	76

The average internal ohmic value [180] is 90.9% of the manufacturers published reference value [198].

### Highest/Lowest Cells

<b>Cell Voltage</b>	Highest: [2.27] String 1 - Cell 11, String 1 - Cell 13, String 1 - Cell 14, and 37 more... Lowest: [2.24] String 1 - Cell 61
<b>Cell Ohmic</b>	Highest: [199] String 1 - Cell 57 Lowest: [165] String 1 - Cell 111
<b>Cell Temperature</b>	Highest: [77] String 1 - Cell 1, String 1 - Cell 2, String 1 - Cell 4, and 72 more... Lowest: [76] String 1 - Cell 3, String 1 - Cell 5, String 1 - Cell 7, and 42 more...
<b>Cell Gravity</b>	Highest: n/a Lowest: n/a
<b>Inter-Cell Connection</b>	Highest: [19] String 1 - Cell 4(B), String 1 - Cell 5(B), String 1 - Cell 9(B), and 14 more... Lowest: [11] String 1 - Cell 5(A), String 1 - Cell 10(A), String 1 - Cell 21(A), and 10 more...
<b>Inter-Tier Connection</b>	Highest: [76] String 1 - Cell 60(C) Lowest: [73] String 1 - Cell 60(B)

### String 1

Cell ID	Serial #	Date Code	Voltage	uOhms	Specific Gravity	Temp.	Inter-cell R (A)	Inter-cell R (B)	Inter-cell R (C)
1	xxxxx	5/2016	2.25	173	n/a	77	18	15	14
2	xxxxx	5/2016	2.26	183	n/a	77	14	17	12
3	xxxxx	5/2016	2.26	182	n/a	76	16	17	15
4	xxxxx	5/2016	2.26	180	n/a	77	14	19	15
5	xxxxx	5/2016	2.26	187	n/a	76	11	19	16
6	xxxxx	5/2016	2.25	182	n/a	77	18	14	15
7	xxxxx	5/2016	2.26	178	n/a	76	17	18	17
8	xxxxx	5/2016	2.26	173	n/a	77	15	15	14
9	xxxxx	5/2016	2.25	185	n/a	76	13	19	14
10	xxxxx	5/2016	2.26	185	n/a	76	11	15	15
11	xxxxx	5/2016	2.27	185	n/a	77	16	18	16
12	xxxxx	5/2016	2.26	180	n/a	77	12	15	15
13	xxxxx	5/2016	2.27	187	n/a	77	12	15	16
14	xxxxx	5/2016	2.27	182	n/a	77	17	17	16
15	xxxxx	5/2016	2.26	188	n/a	76	17	13	15
16	xxxxx	5/2016	2.26	187	n/a	76	13	15	15
17	xxxxx	5/2016	2.27	187	n/a	77	13	19	12

Cell ID	Serial #	Date Code	Voltage	uOhms	Specific Gravity	Temp.	Inter-cell R (A)	Inter-cell R (B)	Inter-cell R (C)
18	xxxxx	5/2016	2.27	187	n/a	77	16	17	16
19	xxxxx	5/2016	2.27	192	n/a	76	17	15	12
20	xxxxx	5/2016	2.26	188	n/a	77	18	12	18
21	xxxxx	5/2016	2.27	183	n/a	76	11	15	17
22	xxxxx	5/2016	2.27	178	n/a	77	14	15	12
23	xxxxx	5/2016	2.27	185	n/a	76	15	14	16
24	xxxxx	5/2016	2.27	178	n/a	77	11	14	16
25	xxxxx	5/2016	2.27	188	n/a	77	14	18	14
26	xxxxx	5/2016	2.25	182	n/a	76	13	13	13
27	xxxxx	5/2016	2.25	187	n/a	77	18	17	13
28	xxxxx	5/2016	2.27	188	n/a	77	11	18	17
29	xxxxx	5/2016	2.27	182	n/a	77	17	14	17
30	xxxxx	5/2016	2.27	182	n/a	76	15	14	12
31	xxxxx	5/2016	2.26	182	n/a	76	13	14	12
32	xxxxx	5/2016	2.26	183	n/a	77	13	13	16
33	xxxxx	5/2016	2.26	182	n/a	77	16	16	15
34	xxxxx	5/2016	2.26	180	n/a	77	11	17	13
35	xxxxx	5/2016	2.25	192	n/a	77	16	15	15
36	xxxxx	5/2016	2.26	197	n/a	76	13	14	17
37	xxxxx	5/2016	2.25	182	n/a	77	11	12	13
38	xxxxx	5/2016	2.26	192	n/a	76	13	13	18
39	xxxxx	5/2016	2.26	192	n/a	77	15	16	12
40	xxxxx	5/2016	2.26	192	n/a	77	12	19	12
41	xxxxx	5/2016	2.27	183	n/a	77	15	18	17
42	xxxxx	5/2016	2.26	182	n/a	77	17	13	15
43	xxxxx	5/2016	2.27	182	n/a	76	15	19	14
44	xxxxx	5/2016	2.27	188	n/a	76	15	15	14
45	xxxxx	5/2016	2.25	185	n/a	77	16	18	17
46	xxxxx	5/2016	2.25	180	n/a	76	14	17	14
47	xxxxx	5/2016	2.26	192	n/a	76	11	15	18
48	xxxxx	5/2016	2.25	187	n/a	77	14	12	18
49	xxxxx	5/2016	2.26	187	n/a	77	16	17	16
50	xxxxx	5/2016	2.26	185	n/a	76	15	17	14
51	xxxxx	5/2016	2.26	182	n/a	76	14	16	13
52	xxxxx	5/2016	2.25	177	n/a	77	13	15	13
53	xxxxx	5/2016	2.26	180	n/a	76	12	15	13
54	xxxxx	5/2016	2.27	182	n/a	76	11	19	18
55	xxxxx	5/2016	2.26	187	n/a	77	18	14	18
56	xxxxx	5/2016	2.26	192	n/a	77	18	19	15
57	xxxxx	5/2016	2.27	199	n/a	77	18	15	12
58	xxxxx	5/2016	2.26	178	n/a	77	15	17	15
59	xxxxx	5/2016	2.25	185	n/a	76	17	16	14
60	xxxxx	5/2016	2.25	180	n/a	76	75 IT	73 IT	76 IT
61	xxxxx	5/2016	2.24	166	n/a	77	15	14	12
62	xxxxx	5/2016	2.27	176	n/a	76	15	13	15
63	xxxxx	5/2016	2.26	171	n/a	77	17	12	13
64	xxxxx	5/2016	2.26	173	n/a	77	12	14	13



Cell ID	Serial #	Date Code	Voltage	uOhms	Specific Gravity	Temp.	Inter-cell R (A)	Inter-cell R (B)	Inter-cell R (C)
65	xxxxx	5/2016	2.27	177	n/a	77	15	19	14
66	xxxxx	5/2016	2.25	180	n/a	76	14	13	18
67	xxxxx	5/2016	2.27	175	n/a	77	15	17	16
68	xxxxx	5/2016	2.27	176	n/a	77	12	18	15
69	xxxxx	5/2016	2.27	179	n/a	77	14	19	12
70	xxxxx	5/2016	2.27	181	n/a	76	16	19	13
71	xxxxx	5/2016	2.25	169	n/a	77	13	14	12
72	xxxxx	5/2016	2.27	170	n/a	77	13	13	12
73	xxxxx	5/2016	2.27	174	n/a	77	16	13	14
74	xxxxx	5/2016	2.26	170	n/a	76	18	14	13
75	xxxxx	5/2016	2.27	180	n/a	77	13	14	15
76	xxxxx	5/2016	2.26	178	n/a	77	18	19	14
77	xxxxx	5/2016	2.25	170	n/a	77	14	13	12
78	xxxxx	5/2016	2.27	178	n/a	76	18	14	16
79	xxxxx	5/2016	2.26	178	n/a	77	12	17	12
80	xxxxx	5/2016	2.25	177	n/a	77	11	12	18
81	xxxxx	5/2016	2.25	172	n/a	77	12	12	14
82	xxxxx	5/2016	2.25	168	n/a	77	11	19	14
83	xxxxx	5/2016	2.26	170	n/a	76	12	19	16
84	xxxxx	5/2016	2.27	174	n/a	77	14	18	16
85	xxxxx	5/2016	2.27	185	n/a	76	18	17	17
86	xxxxx	5/2016	2.26	172	n/a	76	15	16	12
87	xxxxx	5/2016	2.26	177	n/a	77	16	14	13
88	xxxxx	5/2016	2.25	170	n/a	77	18	17	12
89	xxxxx	5/2016	2.25	176	n/a	77	18	16	18
90	xxxxx	5/2016	2.26	180	n/a	76	12	15	13
91	xxxxx	5/2016	2.26	174	n/a	77	14	13	13
92	xxxxx	5/2016	2.25	166	n/a	77	12	12	17
93	xxxxx	5/2016	2.27	176	n/a	77	12	18	16
94	xxxxx	5/2016	2.25	169	n/a	76	13	18	14
95	xxxxx	5/2016	2.25	180	n/a	77	17	15	15
96	xxxxx	5/2016	2.27	175	n/a	76	13	18	13
97	xxxxx	5/2016	2.26	181	n/a	77	18	13	16
98	xxxxx	5/2016	2.27	181	n/a	76	12	12	18
99	xxxxx	5/2016	2.27	177	n/a	77	16	13	14
100	xxxxx	5/2016	2.25	180	n/a	77	18	12	12
101	xxxxx	5/2016	2.26	171	n/a	77	14	15	12
102	xxxxx	5/2016	2.27	175	n/a	76	12	17	15
103	xxxxx	5/2016	2.26	167	n/a	77	17	14	16
104	xxxxx	5/2016	2.26	170	n/a	76	14	12	15
105	xxxxx	5/2016	2.26	182	n/a	77	16	19	16
106	xxxxx	5/2016	2.26	178	n/a	77	12	17	12
107	xxxxx	5/2016	2.26	178	n/a	77	12	15	14
108	xxxxx	5/2016	2.27	181	n/a	76	18	18	16
109	xxxxx	5/2016	2.26	178	n/a	76	12	16	14
110	xxxxx	5/2016	2.26	176	n/a	77	12	12	15
111	xxxxx	5/2016	2.26	165	n/a	77	18	13	14

Cell ID	Serial #	Date Code	Voltage	uOhms	Specific Gravity	Temp.	Inter-cell R (A)	Inter-cell R (B)	Inter-cell R (C)
112	xxxxx	5/2016	2.26	168	n/a	77	11	18	17
113	xxxxx	5/2016	2.26	174	n/a	76	18	16	16
114	xxxxx	5/2016	2.26	172	n/a	77	11	13	16
115	xxxxx	5/2016	2.26	181	n/a	76	18	19	12
116	xxxxx	5/2016	2.27	186	n/a	77	18	19	17
117	xxxxx	5/2016	2.27	179	n/a	77	14	16	13
118	xxxxx	5/2016	2.27	175	n/a	76	13	18	16
119	xxxxx	5/2016	2.25	174	n/a	77	18	14	13
120	xxxxx	5/2016	2.26	174	n/a	76			