

Solar System Report

Summary

6/3/2016

QA901433C

SOL-62000-A901433C

Site Summary

Location: Abu Dhabi
Latitude: 24.39 N
Longitude: 54.55 E

Load Summary

PFB-37002-R-3 + PFB-37002-R-3-SB Qty: 1
POL-21005-3F-R-34B-DT Qty: 1
Load Voltage: 12.00 Volts
Load Wattage: 10.00 Watts

Photovoltaic Module Data

Module Rated Power: 50.00 Watts
Module Rated Voltage: 18.00 Volts
Module Rated Current: 2.78 Amps

Photovoltaic Array Summary

Number Of Series Modules: 1.00 Modules
Number Of Parallel Modules: 1.00 Modules
Total Number of Modules: 1.00 Modules
Rated Power: 50.00 Watts
Minimum PV to Load: 1.28

Battery Cell

Cell Capacity: 70.00 Amp-Hour
Cell Nominal Voltage: 12.00 Volts

Battery Bank

Number of Batteries: 1.00 Batteries
Rated Power: 840.00 Watt-Hour
Number in Series: 1.00 Batteries
Number in Parallel: 1.00 Batteries
Rated Voltage: 12.00 Volts
Estimated Backup: 5.04 Days

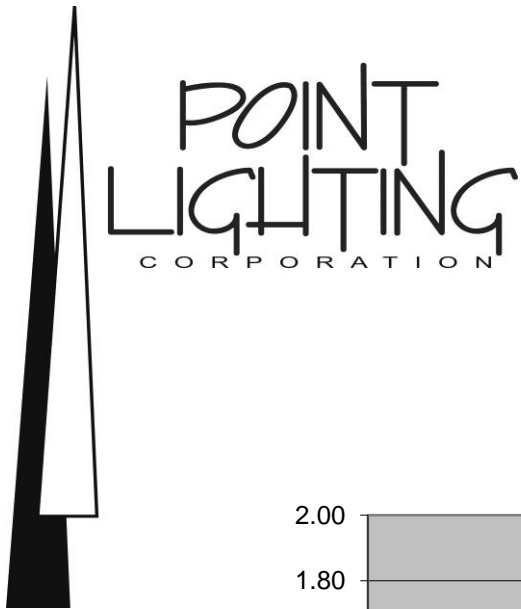
Controller Enclosure

Enclosure Type: NEMA 4X

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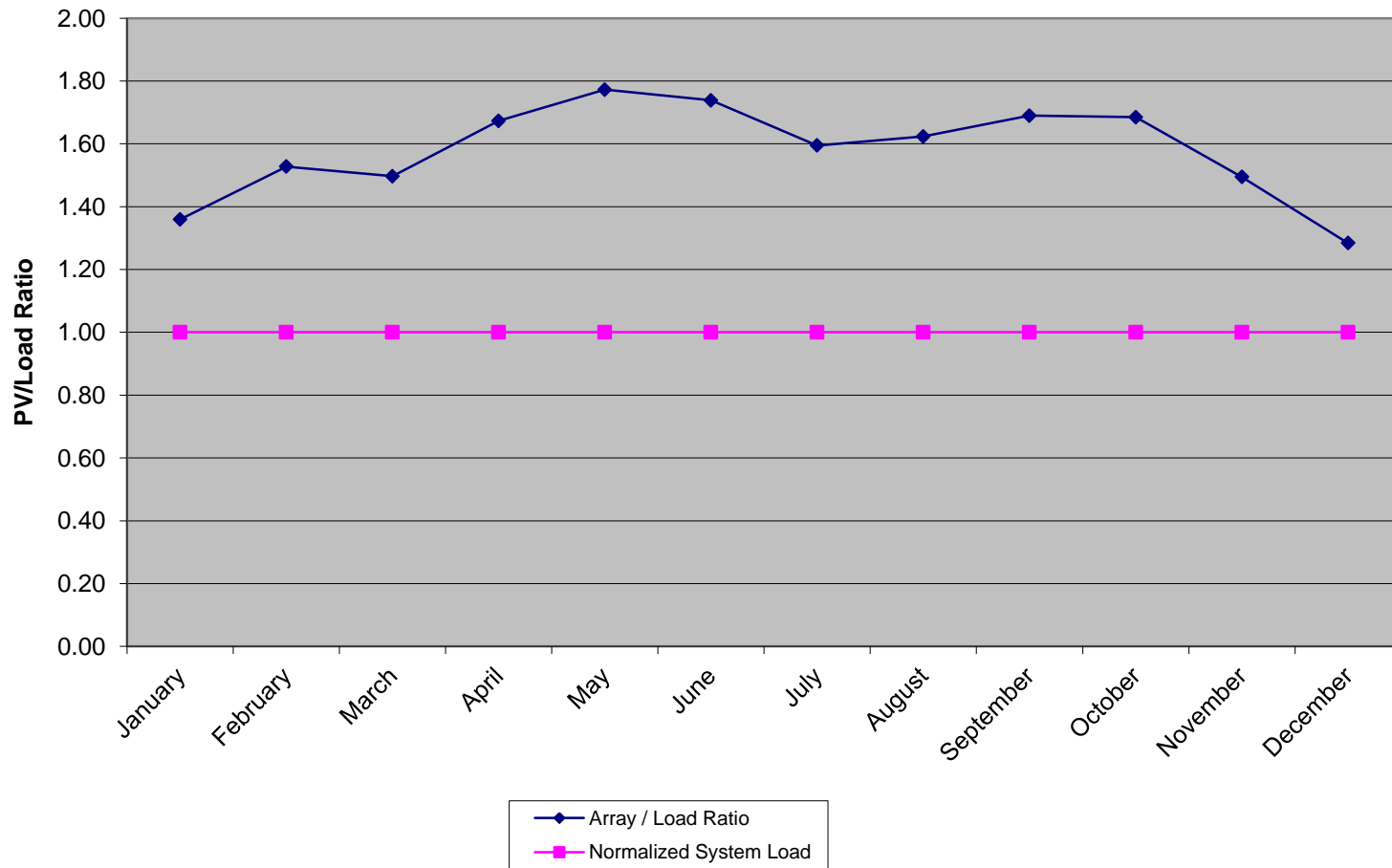
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Battery Backup Sizing

6/3/2016

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System Load Information

PFB-37002-R-3 + PFB-37002-R-3-SB

Load Voltage:	12.00	Volts
Load Wattage:	10.00	Watts
Load Current:	0.83	Amps
Load Maximum Daily Energy Requirement	11.26	Amp-Hours

Battery Cell

Cell Capacity:	70.00	Amp-Hours
Cell Nominal Voltage:	12.00	Volts
Low Temperature Capacity Factor:	0.90	
Maximum Allowable Depth of Discharge:	0.90	

Battery Bank

Batteries in Series:	1.00	Batteries
Batteries in Parallel:	1.00	Batteries
Total Number of Batteries:	1.00	Batteries
Total Voltage:	12.00	Volts
Rated Power:	840.00	Watt-Hours

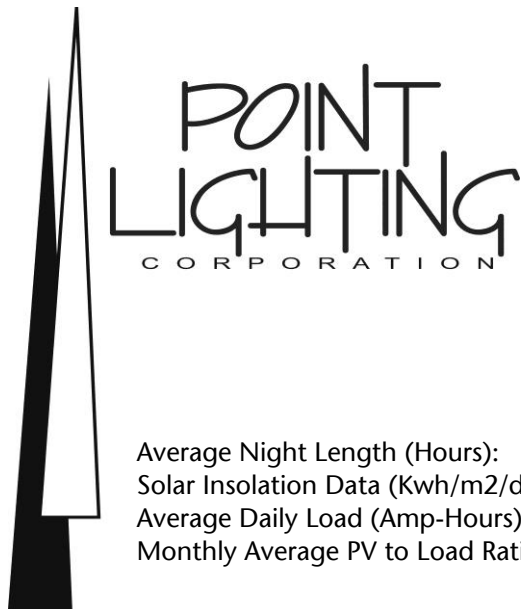
System Capacity

Maximum Discharge Rate	84.00	Hours
Average Daily Depth of Discharge:	16.08	Percent
Target Autonomy:	5.00	Days
Actually Autonomy:	5.04	Days

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Photovoltaic Array Sizing

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Average Night Length (Hours):
 Solar Insolation Data (Kwh/m2/d):
 Average Daily Load (Amp-Hours):
 Monthly Average PV to Load Ratio:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Night Length (Hours):	13.325	12.821	12.145	11.425	10.823	10.518	10.667	11.198	11.887	12.594	13.192	13.484
Solar Insolation Data (Kwh/m2/d):	5.430	5.870	5.450	5.730	5.750	5.480	5.100	5.450	6.020	6.360	5.910	5.190
Average Daily Load (Amp-Hours):	11.104	10.685	10.121	9.521	9.019	8.765	8.890	9.332	9.906	10.495	10.993	11.236
Monthly Average PV to Load Ratio:	1.359	1.527	1.497	1.673	1.772	1.738	1.595	1.624	1.690	1.685	1.495	1.284

Photovoltaic Design Criteria

Critical Month: December
 Critical Month Insolation Data: 5.19 Kwh/m2/d
 Critical Month Longest Night: 13.51 Hours
 Adjusted Daily Load Requirement: 12.95 Amps 15% System Losses Added
 Optimal Array Tilt Angle: 40.00 Degrees
 Array Direction: South

Photovoltaic Module Data

Photovoltaic Module: AltE Alt50-12P
 Module Rated Current: 2.78 Amps
 Module Rated Voltage: 18.00 Volts
 Module Rated Power: 50.00 Watts
 Module Current Derating Factor: 0.90
 Module Temperature Derating Factor: 0.80

Photovoltaic Array Sizing

Number Of Series Modules: 1.00 Modules
 Number Of Parallel Modules: 1.00 Modules
 Total Number Of Modules: 1.00 Modules
 Total Array Power: 50 Watts
 Critical Month PV to Load Ratio: 1.28 December
 Critical Month Array Output: 12.99 Amp-Hours

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Average Night Length

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Day	Average Night Length	Hrs
1-Jan	13.48	Hrs
2-Jan	13.47	Hrs
3-Jan	13.47	Hrs
4-Jan	13.46	Hrs
5-Jan	13.45	Hrs
6-Jan	13.45	Hrs
7-Jan	13.44	Hrs
8-Jan	13.43	Hrs
9-Jan	13.42	Hrs
10-Jan	13.41	Hrs
11-Jan	13.40	Hrs
12-Jan	13.39	Hrs
13-Jan	13.38	Hrs
14-Jan	13.37	Hrs
15-Jan	13.35	Hrs
16-Jan	13.34	Hrs
17-Jan	13.33	Hrs
18-Jan	13.32	Hrs
19-Jan	13.30	Hrs
20-Jan	13.29	Hrs
21-Jan	13.27	Hrs
22-Jan	13.26	Hrs
23-Jan	13.24	Hrs
24-Jan	13.23	Hrs
25-Jan	13.21	Hrs
26-Jan	13.20	Hrs
27-Jan	13.18	Hrs
28-Jan	13.16	Hrs
29-Jan	13.15	Hrs
30-Jan	13.13	Hrs
31-Jan	13.11	Hrs

Day	Average Night Length	Hrs
1-Feb	13.09	Hrs
2-Feb	13.07	Hrs
3-Feb	13.06	Hrs
4-Feb	13.04	Hrs
5-Feb	13.02	Hrs
6-Feb	13.00	Hrs
7-Feb	12.98	Hrs
8-Feb	12.96	Hrs
9-Feb	12.94	Hrs
10-Feb	12.92	Hrs
11-Feb	12.90	Hrs
12-Feb	12.88	Hrs
13-Feb	12.86	Hrs
14-Feb	12.84	Hrs
15-Feb	12.82	Hrs
16-Feb	12.80	Hrs
17-Feb	12.77	Hrs
18-Feb	12.75	Hrs
19-Feb	12.73	Hrs
20-Feb	12.71	Hrs
21-Feb	12.69	Hrs
22-Feb	12.66	Hrs
23-Feb	12.64	Hrs
24-Feb	12.62	Hrs
25-Feb	12.60	Hrs
26-Feb	12.58	Hrs
27-Feb	12.55	Hrs
28-Feb	12.53	Hrs

Day	Average Night Length	Hrs
1-Mar	12.51	Hrs
2-Mar	12.48	Hrs
3-Mar	12.46	Hrs
4-Mar	12.44	Hrs
5-Mar	12.42	Hrs
6-Mar	12.39	Hrs
7-Mar	12.37	Hrs
8-Mar	12.35	Hrs
9-Mar	12.32	Hrs
10-Mar	12.30	Hrs
11-Mar	12.28	Hrs
12-Mar	12.25	Hrs
13-Mar	12.23	Hrs
14-Mar	12.21	Hrs
15-Mar	12.18	Hrs
16-Mar	12.16	Hrs
17-Mar	12.13	Hrs
18-Mar	12.11	Hrs
19-Mar	12.09	Hrs
20-Mar	12.06	Hrs
21-Mar	12.04	Hrs
22-Mar	12.02	Hrs
23-Mar	11.99	Hrs
24-Mar	11.97	Hrs
25-Mar	11.95	Hrs
26-Mar	11.92	Hrs
27-Mar	11.90	Hrs
28-Mar	11.87	Hrs
29-Mar	11.85	Hrs
30-Mar	11.83	Hrs
31-Mar	11.80	Hrs

Day	Average Night Length	Hrs
1-Apr	11.78	Hrs
2-Apr	11.76	Hrs
3-Apr	11.73	Hrs
4-Apr	11.71	Hrs
5-Apr	11.69	Hrs
6-Apr	11.66	Hrs
7-Apr	11.64	Hrs
8-Apr	11.62	Hrs
9-Apr	11.59	Hrs
10-Apr	11.57	Hrs
11-Apr	11.55	Hrs
12-Apr	11.52	Hrs
13-Apr	11.50	Hrs
14-Apr	11.48	Hrs
15-Apr	11.46	Hrs
16-Apr	11.43	Hrs
17-Apr	11.41	Hrs
18-Apr	11.39	Hrs
19-Apr	11.37	Hrs
20-Apr	11.34	Hrs
21-Apr	11.32	Hrs
22-Apr	11.30	Hrs
23-Apr	11.28	Hrs
24-Apr	11.26	Hrs
25-Apr	11.23	Hrs
26-Apr	11.21	Hrs
27-Apr	11.19	Hrs
28-Apr	11.17	Hrs
29-Apr	11.15	Hrs
30-Apr	11.13	Hrs

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Day	Average Night Length	Hrs
1-May	11.11	Hrs
2-May	11.09	Hrs
3-May	11.07	Hrs
4-May	11.05	Hrs
5-May	11.03	Hrs
6-May	11.01	Hrs
7-May	10.99	Hrs
8-May	10.97	Hrs
9-May	10.95	Hrs
10-May	10.93	Hrs
11-May	10.91	Hrs
12-May	10.90	Hrs
13-May	10.88	Hrs
14-May	10.86	Hrs
15-May	10.84	Hrs
16-May	10.83	Hrs
17-May	10.81	Hrs
18-May	10.79	Hrs
19-May	10.78	Hrs
20-May	10.76	Hrs
21-May	10.75	Hrs
22-May	10.73	Hrs
23-May	10.72	Hrs
24-May	10.70	Hrs
25-May	10.69	Hrs
26-May	10.68	Hrs
27-May	10.66	Hrs
28-May	10.65	Hrs
29-May	10.64	Hrs
30-May	10.63	Hrs
31-May	10.62	Hrs

Day	Average Night Length	Hrs
1-Jun	10.60	Hrs
2-Jun	10.59	Hrs
3-Jun	10.58	Hrs
4-Jun	10.57	Hrs
5-Jun	10.57	Hrs
6-Jun	10.56	Hrs
7-Jun	10.55	Hrs
8-Jun	10.54	Hrs
9-Jun	10.53	Hrs
10-Jun	10.53	Hrs
11-Jun	10.52	Hrs
12-Jun	10.52	Hrs
13-Jun	10.51	Hrs
14-Jun	10.51	Hrs
15-Jun	10.50	Hrs
16-Jun	10.50	Hrs
17-Jun	10.50	Hrs
18-Jun	10.49	Hrs
19-Jun	10.49	Hrs
20-Jun	10.49	Hrs
21-Jun	10.49	Hrs
22-Jun	10.49	Hrs
23-Jun	10.49	Hrs
24-Jun	10.49	Hrs
25-Jun	10.49	Hrs
26-Jun	10.49	Hrs
27-Jun	10.50	Hrs
28-Jun	10.50	Hrs
29-Jun	10.50	Hrs
30-Jun	10.51	Hrs

Day	Average Night Length	Hrs
1-Jul	10.51	Hrs
2-Jul	10.52	Hrs
3-Jul	10.52	Hrs
4-Jul	10.53	Hrs
5-Jul	10.53	Hrs
6-Jul	10.54	Hrs
7-Jul	10.55	Hrs
8-Jul	10.56	Hrs
9-Jul	10.57	Hrs
10-Jul	10.57	Hrs
11-Jul	10.58	Hrs
12-Jul	10.59	Hrs
13-Jul	10.60	Hrs
14-Jul	10.62	Hrs
15-Jul	10.63	Hrs
16-Jul	10.64	Hrs
17-Jul	10.65	Hrs
18-Jul	10.66	Hrs
19-Jul	10.68	Hrs
20-Jul	10.69	Hrs
21-Jul	10.70	Hrs
22-Jul	10.72	Hrs
23-Jul	10.73	Hrs
24-Jul	10.75	Hrs
25-Jul	10.76	Hrs
26-Jul	10.78	Hrs
27-Jul	10.79	Hrs
28-Jul	10.81	Hrs
29-Jul	10.83	Hrs
30-Jul	10.84	Hrs
31-Jul	10.86	Hrs

Day	Average Night Length	Hrs
1-Aug	10.88	Hrs
2-Aug	10.90	Hrs
3-Aug	10.91	Hrs
4-Aug	10.93	Hrs
5-Aug	10.95	Hrs
6-Aug	10.97	Hrs
7-Aug	10.99	Hrs
8-Aug	11.01	Hrs
9-Aug	11.03	Hrs
10-Aug	11.05	Hrs
11-Aug	11.07	Hrs
12-Aug	11.09	Hrs
13-Aug	11.11	Hrs
14-Aug	11.13	Hrs
15-Aug	11.15	Hrs
16-Aug	11.17	Hrs
17-Aug	11.19	Hrs
18-Aug	11.21	Hrs
19-Aug	11.23	Hrs
20-Aug	11.26	Hrs
21-Aug	11.28	Hrs
22-Aug	11.30	Hrs
23-Aug	11.32	Hrs
24-Aug	11.34	Hrs
25-Aug	11.37	Hrs
26-Aug	11.39	Hrs
27-Aug	11.41	Hrs
28-Aug	11.43	Hrs
29-Aug	11.46	Hrs
30-Aug	11.48	Hrs
31-Aug	11.50	Hrs

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Day	Average Night Length	Hrs
1-Sep	11.52	Hrs
2-Sep	11.55	Hrs
3-Sep	11.57	Hrs
4-Sep	11.59	Hrs
5-Sep	11.62	Hrs
6-Sep	11.64	Hrs
7-Sep	11.66	Hrs
8-Sep	11.69	Hrs
9-Sep	11.71	Hrs
10-Sep	11.73	Hrs
11-Sep	11.76	Hrs
12-Sep	11.78	Hrs
13-Sep	11.80	Hrs
14-Sep	11.83	Hrs
15-Sep	11.85	Hrs
16-Sep	11.87	Hrs
17-Sep	11.90	Hrs
18-Sep	11.92	Hrs
19-Sep	11.95	Hrs
20-Sep	11.97	Hrs
21-Sep	11.99	Hrs
22-Sep	12.02	Hrs
23-Sep	12.04	Hrs
24-Sep	12.06	Hrs
25-Sep	12.09	Hrs
26-Sep	12.11	Hrs
27-Sep	12.13	Hrs
28-Sep	12.16	Hrs
29-Sep	12.18	Hrs
30-Sep	12.21	Hrs

Day	Average Night Length	Hrs
1-Oct	12.23	Hrs
2-Oct	12.25	Hrs
3-Oct	12.28	Hrs
4-Oct	12.30	Hrs
5-Oct	12.32	Hrs
6-Oct	12.35	Hrs
7-Oct	12.37	Hrs
8-Oct	12.39	Hrs
9-Oct	12.42	Hrs
10-Oct	12.44	Hrs
11-Oct	12.46	Hrs
12-Oct	12.48	Hrs
13-Oct	12.51	Hrs
14-Oct	12.53	Hrs
15-Oct	12.55	Hrs
16-Oct	12.58	Hrs
17-Oct	12.60	Hrs
18-Oct	12.62	Hrs
19-Oct	12.64	Hrs
20-Oct	12.66	Hrs
21-Oct	12.69	Hrs
22-Oct	12.71	Hrs
23-Oct	12.73	Hrs
24-Oct	12.75	Hrs
25-Oct	12.77	Hrs
26-Oct	12.80	Hrs
27-Oct	12.82	Hrs
28-Oct	12.84	Hrs
29-Oct	12.86	Hrs
30-Oct	12.88	Hrs
31-Oct	12.90	Hrs

Day	Average Night Length	Hrs
1-Nov	12.92	Hrs
2-Nov	12.94	Hrs
3-Nov	12.96	Hrs
4-Nov	12.98	Hrs
5-Nov	13.00	Hrs
6-Nov	13.02	Hrs
7-Nov	13.04	Hrs
8-Nov	13.06	Hrs
9-Nov	13.07	Hrs
10-Nov	13.09	Hrs
11-Nov	13.11	Hrs
12-Nov	13.13	Hrs
13-Nov	13.15	Hrs
14-Nov	13.16	Hrs
15-Nov	13.18	Hrs
16-Nov	13.20	Hrs
17-Nov	13.21	Hrs
18-Nov	13.23	Hrs
19-Nov	13.24	Hrs
20-Nov	13.26	Hrs
21-Nov	13.27	Hrs
22-Nov	13.29	Hrs
23-Nov	13.30	Hrs
24-Nov	13.32	Hrs
25-Nov	13.33	Hrs
26-Nov	13.34	Hrs
27-Nov	13.35	Hrs
28-Nov	13.37	Hrs
29-Nov	13.38	Hrs
30-Nov	13.39	Hrs

Day	Average Night Length	Hrs
1-Dec	13.40	Hrs
2-Dec	13.41	Hrs
3-Dec	13.42	Hrs
4-Dec	13.43	Hrs
5-Dec	13.44	Hrs
6-Dec	13.45	Hrs
7-Dec	13.45	Hrs
8-Dec	13.46	Hrs
9-Dec	13.47	Hrs
10-Dec	13.47	Hrs
11-Dec	13.48	Hrs
12-Dec	13.49	Hrs
13-Dec	13.49	Hrs
14-Dec	13.49	Hrs
15-Dec	13.50	Hrs
16-Dec	13.50	Hrs
17-Dec	13.50	Hrs
18-Dec	13.51	Hrs
19-Dec	13.51	Hrs
20-Dec	13.51	Hrs
21-Dec	13.51	Hrs
22-Dec	13.51	Hrs
23-Dec	13.51	Hrs
24-Dec	13.51	Hrs
25-Dec	13.51	Hrs
26-Dec	13.51	Hrs
27-Dec	13.50	Hrs
28-Dec	13.50	Hrs
29-Dec	13.50	Hrs
30-Dec	13.49	Hrs
31-Dec	13.49	Hrs

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