ENERGY MAXIMIZER SYSTEMS PHIL. INC.

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April 5, 2005

LAGOON DEVELOPMENT CORP.
Pavilion Mall, Binan , Laguna

Attention: Justinn Valerio
Facilities Manager

Subject : EMS Envirostart Testing on Air Handling Unit No. 513

Dear Sir:

This report summarizes the results of the testing as well as data gathered with corresponding analysis on the Air Handling Unit (AHU) No. 513 fitted with an Envirostart Motor Energy Control. Here are the list of equipment used for the test:

Air Handling Unit (AHU) No. 513;Reated 10 HP (7.5kW)
Envirostart Model No. 400-TPMEC-15kW
EIG Multi-Function Power Monitor Model No. DMMS 300+
Nexus Communicator Software
Toshiba Laptop Computer

Methodology:

1. The AHU was started at 11:40 AM , and allowed to run for 10 minutes to normalize the load. Measurements were started at 11:50 AM with the Envirostart unit in Optimization Mode and the measurements of KW, KWH and P.F. were taken every 10 minutes perhour.
2. Energy control settings at Maximum, continued measurements for one hour (2nd .
3. Energy contreol settings at Minimum, continued measurements for one hour (3rd).
4. Envirostart in By-Pass mode, continued measurements for 3 hours. (4th-6th).
5 At 6:00 PM ,End of testing

Meter Data

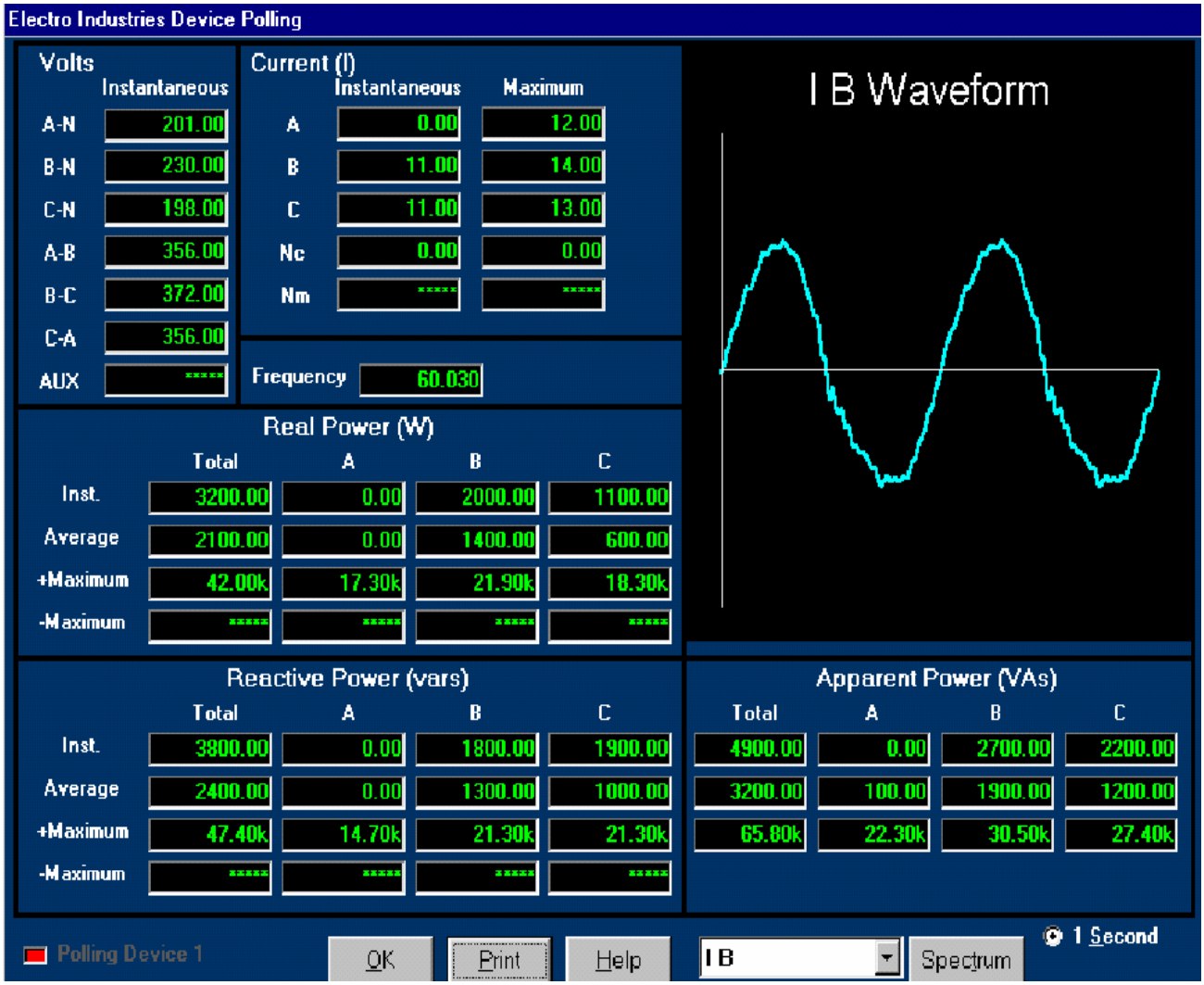
Pavilion Mall
Load Profile
With Envirostart
04 April 2005

Motor :	AHU 513	10 HP	7.5KW

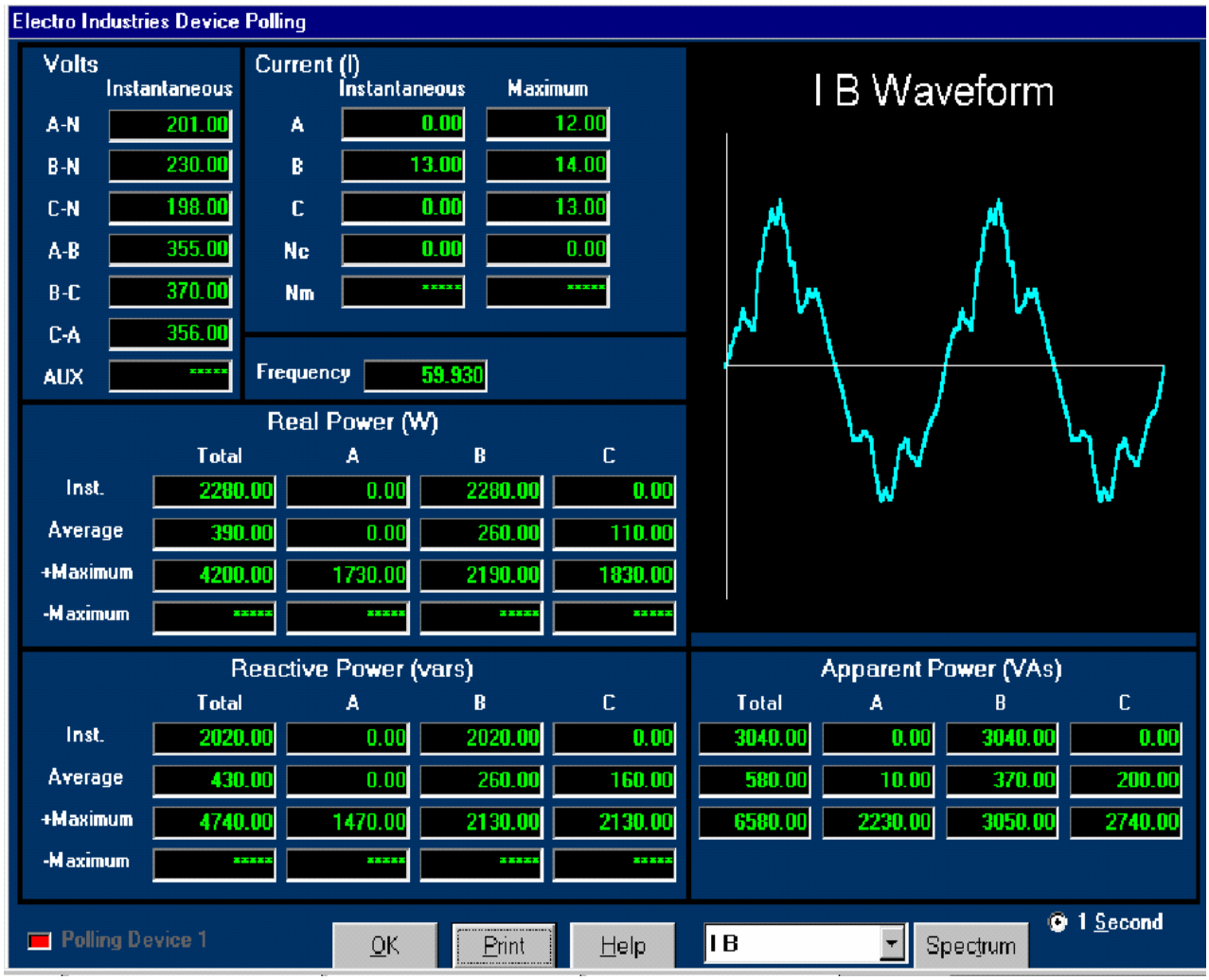
Technicians :
Gerry/Rommel

Time	KwHr Reading	KW	PF	notes	KwHrs Consumed		
11:50 AM	0	3.06	0.662	Default			
12:00 NN	0.576	3.33	0.688		0.576		
12:10 PM	1.06	3.15	0.589		0.484		
12:20 PM	1.544	3.21	0.649		0.484		
12:30 PM	2.052	3.2	0.64		0.508		
12:40 PM	2.651	4.55	0.736	MAX setting	0.599		
12:50 PM	3.002	2.91	0.78		0.351	3.002	Total kWHr 1st Hour
1:00 PM	3.432	3.05	0.673		0.43		
1:10 PM	3.827	3.09	0.655		0.395		
1:20 PM	4.521	3.51	0.686		0.694		
1:30 PM	4.8	2.11	0.686		0.279		
1:40 PM	5.267	2.22	0.752		0.467		
1:50 PM	5.75	3.11	0.633		0.483	2.748	Total, 2nd Hour
2:00 PM	6.21	3.11	0.638	MIN. Settings	0.46		
2:10 PM	6.705	3.03	0.63		0.495		
2:20 PM	7.152	3.19	0.63		0.447		
2:30 PM	7.618	2.22	0.738		0.466		
2:40 PM	8.096	3.03	0.638		0.478		
2:50 PM	8.571	3.3	0.698		0.475	2.821	**Total, 3rd Hour 8.571 kWhrs.**
3:00 PM	8.947	3.1	0.64	By-Pass	0.376		Start w/o EMS
3:10 PM	9.487	3.2	0.638		0.54		
3:20 PM	9.997	3.1	0.641		0.51		
3:30 PM	10.505	3.1	0.636		0.508		
3:40 PM	11.027	3.3	0.646		0.522		
3:50 PM	11.568	3.3	0.645		0.541		
4:00 PM	12.161	3.2	0.632		0.593	3.214	Total, 4th Hour
4:10 PM	12.571	3.1	0.627		0.41		
4:20 PM	13.079	3.2	0.628		0.508		
4:30 PM	13.636	3.3	0.633		0.557		
4:40 PM	14.151	3.2	0.618		0.515		
4:50 PM	14.669	3.2	0.636		0.518		
5:00 PM	15.156	3.1	0.614		0.487	2.995	Total, 5th Hour
5:10 PM	15.683	3.2	0.62		0.527		
5:20 PM	16.208	3.2	0.611		0.525		
5:30 PM	16.737	3.3	0.627		0.529		
5:40 PM	17.289	3.2	0.619		0.552		
5:50 PM	17.801	3.3	0.631		0.512		
6:00 PM	18.34	3.3	0.634		0.539	3.184	**Total, 6th Hour 9.393 kWHrs.**

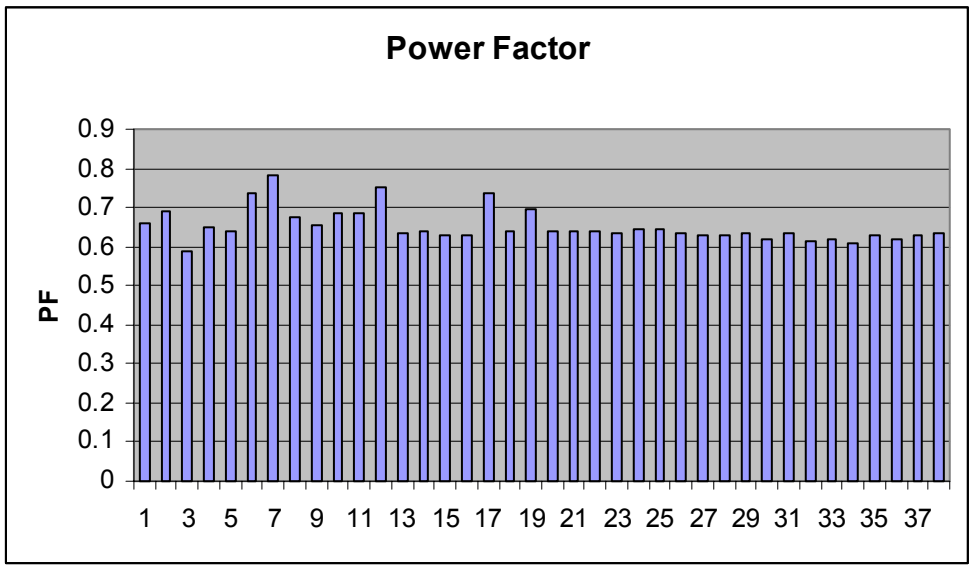
Waveform Capture of Current Waveform Without Envirostart



Waveform Capture of Current With Envirostart



Power Factor Behavior



1-6 : Default Settings
7-12 : Maximum Energy Savings
13-19 : Minimum Energy Savings
20-37 : By-Pass Mode

Energy Savings

Energy Savings = $\frac{\text{Total kWHrs (without EMS)} - \text{Total kWHrs (with EMS)} \times 100}{\text{Total kWhrs (without EMS)}}$

= 9.393 – 8.571 / 9.393 x 100
= 8.75 %

Conclusion:

When fitted with EMS Envirostart, AHU 513 can readily achieve Energy Savings of 8-10%.

Compiled by : Engr. Jeffrey J. Godinez, ECE 05 April 2005