BASICPOWER™

East Stroudsburg Borough water supply

Power Quality Report

Jan 16, 2015

Summary

East Stroudsburg Borough owns and operates its own municipal water supply and distribution system, and sewage collection and disposal system. The Borough's Sewer Treatment Plant is located at 368 Lincoln Avenue. The main electrical service enters the Control Building from a 500 kVA pad mounted transformer with the primary voltage at 13.2 kV and the secondary voltage at 120/208 volt three phase, four wire. The main disconnect is a fused bolted switch fused at 1600 amps per phase.

The primary power consuming equipment operating in the plant are pumps of different sizes for varied purposes. In addition to the issues with power quality being delivered by the electrical service, this type of equipment generates harmonics which creates the opportunity for the Basic Power Unit ("BPU™") to reduce kilowatt usage.

With the consent of Jim Phillips, the Borough Manager, Basic Power worked with Brian Ace, Sewer Plant Manager, and Scott Sherwood, electrical contractor, to demonstrate a BPU™ unit. On January 16, 2015, Basic Power, Inc. conducted a demonstration of its BPU™ at the sewer collection and disposal plant. The purpose of the demonstration was to gather information about the power consumption of the plant and to size the appropriate BPU™ model for possible installation at a future date. Mr. Sherwood and Basic Power temporarily installed a BPU™ Model C-208-4 that it determined would be the appropriate size model. This BPU™ was wired into the electrical panel in parallel and without any interruption to the plant and then the data gathering process was completed.

This report contains the results of improved power efficiency based on measured power usage data after the installation of the BPU™. Mr. Sherwood wired the BPU™ into a breaker subpanel and Basic Power conducted the data gathering using the Dranetz-BMI Xplorer Power Analyzer with certified electrical probes. The Dranetz device is widely accepted in the Utility industry as the most accurate instrument for collecting and recording electrical power data. The Dranetz meter used was calibrated and certified.

A timed test was performed with the BPU™ both "On" and "Off". Power Factor increased by from a good .95 reading to a near 1 reading which is expected, due to the type of loads operating. The Location **revealed** a **cumulative energy savings, measured in kW of 16.3%.** This would result in monthly savings of approximately $160 for every $1,000.00 billed.

Measured Data

The power efficiency was measured using a timed test with the BPU™ "Off" and the BPU™ "On". Basic Power performed measurements and data analysis. All original data can be provided upon request.

Measurements were taken at the primary feed switchgear utilizing a Dranetz-BMI Power Xplorer Analyzer and certified probes. The data was taken over an approximate 20-minute period with the BPU™ "On" and with the BPU™ "Off". The averages of these "ON" and "OFF" tests were then compared and analyzed below.

East Stroudsburg (3 phase 208V) – BPU™ Test Results

	EBU OFF	EBU ON	Difference	% Change
Voltage	V123.21	123.68V	+.004	**.4%**
Current	300 A	225 A	-75.0	**-25.0%**
PF	0.95	1.0	-5.0	**-5.0%**
Cumulative Energy (kW)	67.68	58.81	-8.87	**-13.1%**

MIN/MAX/AVG POWER REPORT

Site: basicpower 208 Sewer Plant
Measured from 01/16/2015 11:17:33.0 to 01/16/2015 11:36:27.0

POWER

ACTIVE POWER, P (W)

	A	B	C	TOTAL	
Min kW	15.868	16.738	12.950	45.57 on 01/16/2015 11:25:30	
Max kW	25.089	24.362	20.799	70.25 on 01/16/2015 11:32:00	
Median kW	21.544	21.258	17.265	60.12	
Average kW	20.976	20.854	16.990	58.82	16.3% Savings

APPARENT POWER,S (VA)

	A	B	C	TOTAL	
Min kVA	17.302	17.038	13.606	47.96 on 01/16/2015 11:25:30	
Max kVA	26.374	24.630	21.619	72.62 on 01/16/2015 11:32:00	
Median kVA	23.350	21.575	18.571	63.34	
Average kVA	22.633	21.237	18.008	61.88	14.8% Savings

REACTIVE POWER Q, AT FUND. FREQ. (VAR)

	A	B	C	TOTAL
Min kVAR	-10.365	-5.711	-7.972	-23.988 on 01/16/2015 11:30:00
Max kVAR	0.000	0.000	0.000	0.000 on 01/16/2015 11:18:00
Median kVAR	-7.759	-3.445	-4.985	-15.811
Average kVAR	-8.264	-3.675	-5.593	-17.533

POWER FACTOR, PF

	A	B	C	TOTAL	
Min	-0.955	-0.994	-0.974	-0.973 on 01/16/2015 11:35:00	
Max	0.000	0.000	0.000	0.000 on 01/16/2015 11:18:00	
Median	-0.918	-0.982	-0.952	-0.951	
Average	-0.926	-0.982	-0.944	-0.951	5.0% Improvement

DEMAND

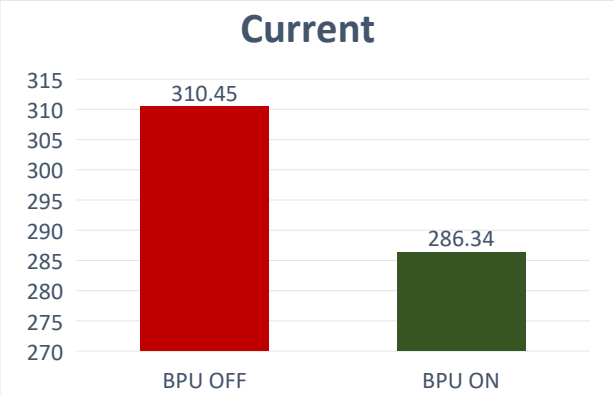
REAL POWER DEMAND

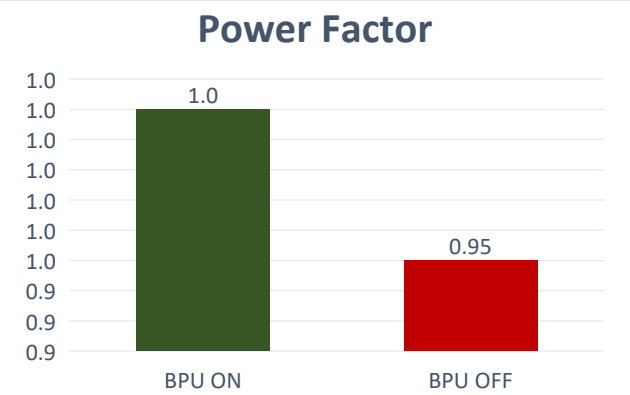
	A	B	C	TOTAL	
Min kWh/h				45.98 on 01/16/2015 11:27:30	
Max kWh/h				67.68 on 01/16/2015 11:31:30	
Median kWh/h				60.12	
Average kWh/h				58.81	13.1% Savings

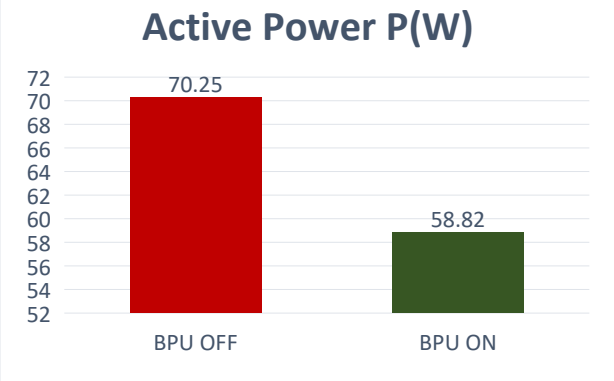
ENERGY

ENERGY - INTEGRATED ACTIVE POWER (W-HRS)

	A	B	C	TOTAL
kWh	5.941	5.897	4.814	16.651 on 01/16/2015 11:36:00

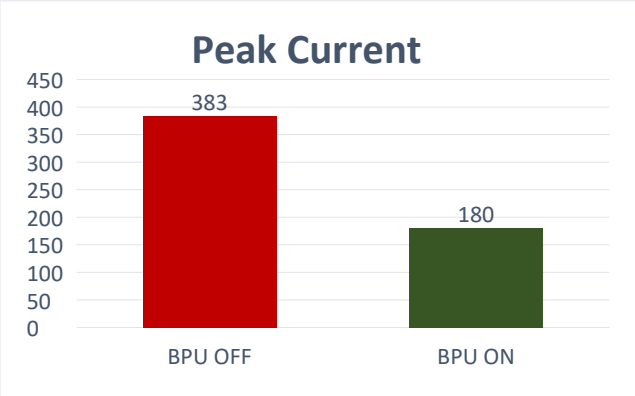






Peak Current Test

A peak current test was performed at this location determine the effect of a current in-rush with the BPU™ “On” and “Off”. This was automatically monitored by the Dranetz Power Analyzer, and was performed with the BPU™ both “On” and “Off”.



This location showed a 53% reduction in peak current at this location, with the BPU™ turned “ON” versus when it was turned “OFF”.

Any sudden increase and/or spike in demand directly affects the Demand line item on the electrical utility bill. The BPU™ effectively clips and/or suppresses the current spike under sudden demand response situations such as simply turning lights on and equipment cycling on and off.

Analysis

The BPU™ has shown improvments in the Sewer Plant with regard to current draw, peak current, kW savings (actual energy savings), and power factor.

1. This facility had well balanced phases during our testing. As a result, there was little room for improvement. However, this may change as different loads are running, which could otherwise lead to an unbalancing of the phases. With the BPU™ in place, this will continuously be corrected for each phase equally and will provide a safeguard against any future anamolies.

2. Total current draw at the location was reduced by over **25%**.

3. kW (Active Power) consumption was reduced by **16.3%**, thereby reducing the electrical utility bill.

4. The average power factor was very good to begin with, but showed an increase from .95 to unity 1.00.

5. Peak current was reduced in the location by **53%**. The BPU™ clips and/or supresses the spike in current for any sudden demand conditions.

The BPU™ is the only system in the market place that provides an all-in-one solution. Many systems simply improve power factor and nothing else. Even with the power factor as high as it was, the BPU™ still reduced kW consumption by 16.3%.

No other solution in the industry can provide these features combined with true kW savings and still having many feactures all in one product.

BPU™ Capability

The BPU™ and its former generations have been awarded mulitple patents and an additional patent is currently pending. Additional independent validation tests are currently being conducted by third parties.

The BPU™ provides a unique method of harmonics supression which are inherent in an electical system. It effectively increases Power Factor while reducing current draw on the electrical feed. Minimizing the harmonics in electrical systems allows the BPU™ to eliminate wasted energy in your system thereby reducing kWh consumption.

Further, the BPU™ provides -lightning protection, -surge suppression, -phase balancing, -voltage sag swell reduction, -power factor correction, -harmonic mitigation, and current reduction, all in a single solution at the facility level. Also, the BPU™ is installed in parallel versus in series and can be installed at the facility level or on specific equipment depending on the customer's needs. Because it is in parallel, the BPU™ can be installed without interruption to the electrical circuits and can be turned "ON" and "OFF" to shows prove its impact on Power Quality which is reflected in our utility bill. This maximizes up time and business continuity, greatly reduces machine maintenance, and increases machine service life.

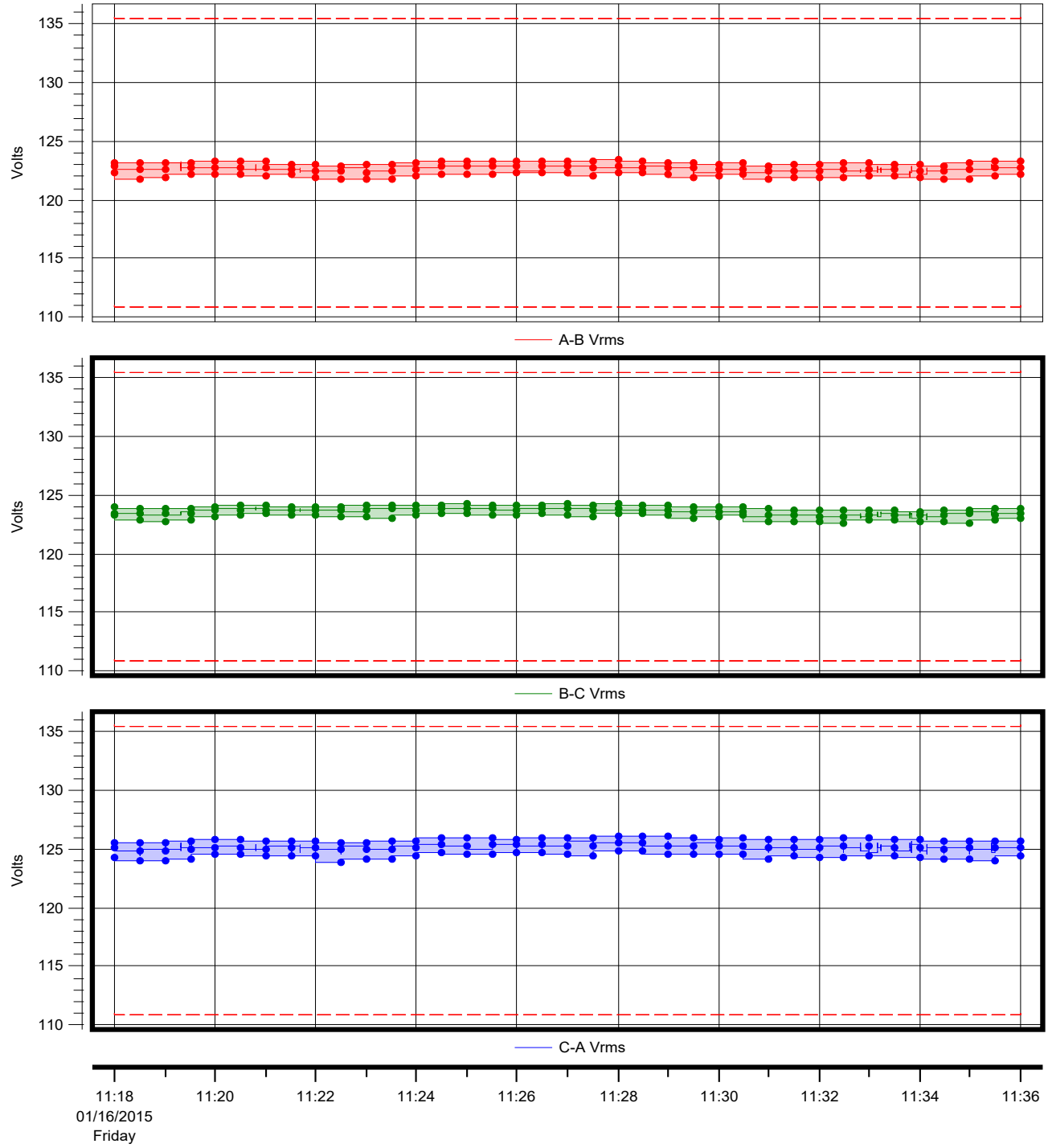
A Winning Solution

Feature	Description	Consumer Benefit
Electromagnetic Solid State Reactor Core	Evenly distributes load, captures wasted energy, and regenerates lost energy into useable power	Reduced power consumption and provides a reduction of kilowatt savings of between 8 and 20%+
Lightning Protection and Surge Suppression	Provides whole building lightning protection and surge suppression	No need to purchase lighting protection or surge suppression devices for the building or individual equipment
Eliminates Harmonic Distortion	Patented active filtration technology	Reduces equipment maintenance and extends equipment service life. No need to purchase harmonic filters for individual equipment.
Eliminates Sags and Swells	Power management techniques balances the voltage supplied to equipment	Reduces impact on sensitive electronic control equipment eliminating waste for downtime
Phase Balancing	Distributes load across each phase evenly	Contributes to kWh savings and reduces infrastructure costs
Power Factor Correction	Power management techniques	Reduces all Demand Charges levied by utility company. May eliminate the need to purchase PF Correction devices

VOLTAGE TIMEPLOTS

Site: basicpower 208 Sewer Plant

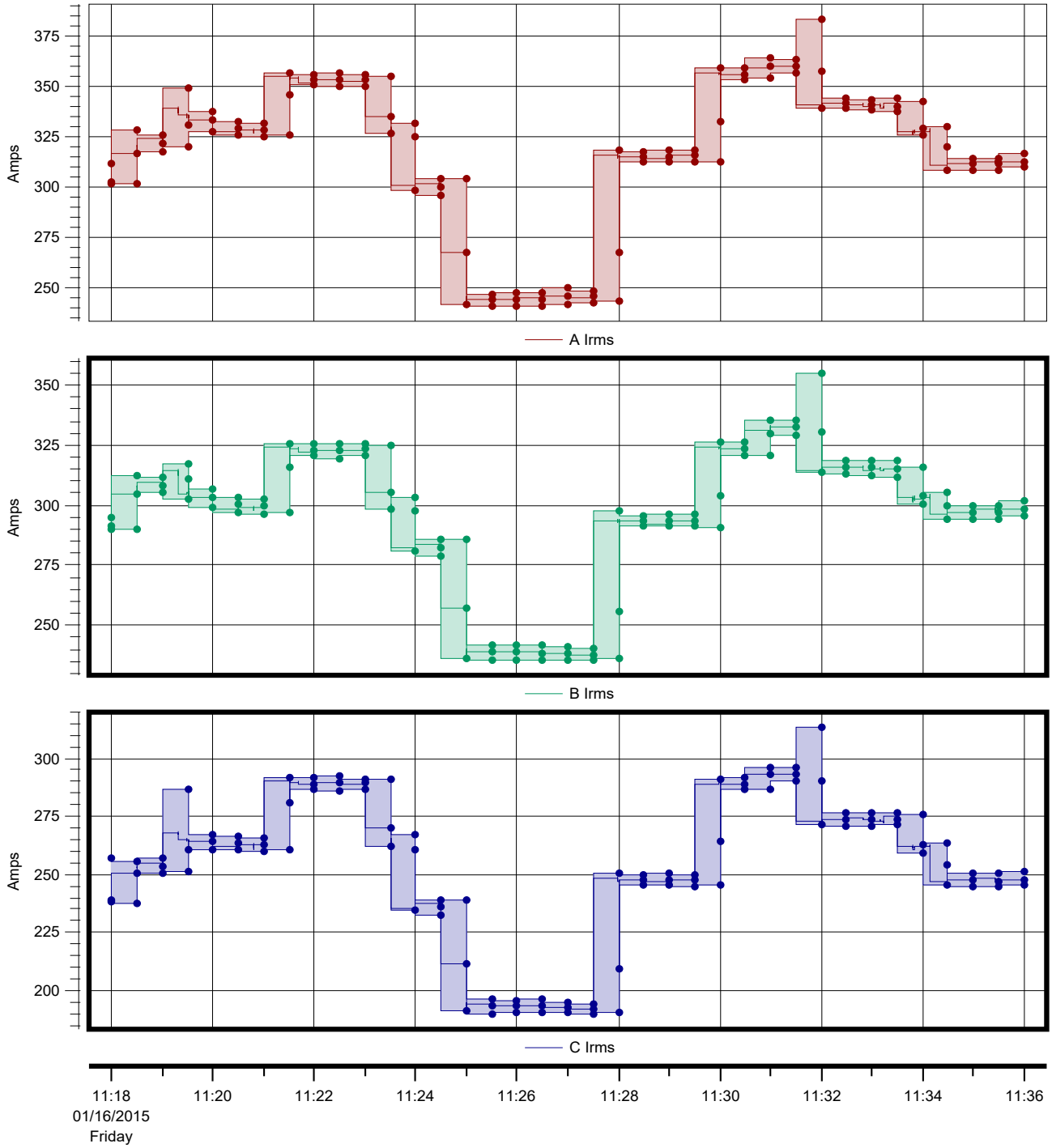
Measured from 01/16/2015 11:17:33.0 to 01/16/2015 11:36:27.0



CURRENT TIMEPLOTS

Site: basicpower 208 Sewer Plant

Measured from 01/16/2015 11:17:33.0 to 01/16/2015 11:36:27.0



MIN/MAX/AVG SUMMARY REPORT

Site: basicpower 208 Sewer Plant
Measured from 01/16/2015 11:17:33.0 to 01/16/2015 11:36:27.0

VOLTAGE

	Channel A	**Channel B**
Min Volts	70.73 on 01/16/2015 11:32:30	71.17 on 01/16/2015 11:35:00
Max Volts	72.05 on 01/16/2015 11:21:00	72.47 on 01/16/2015 11:25:00
Median Volts	71.49	71.86
Average Volts	71.47	71.86
	Channel C	**Channel A-B**
Min Volts	70.35 on 01/16/2015 11:22:30	121.71 on 01/16/2015 11:35:00
Max Volts	71.93 on 01/16/2015 11:28:00	123.41 on 01/16/2015 11:28:00
Median Volts	71.27	122.67
Average Volts	71.23	122.67
	Channel B-C	**Channel C-A**
Min Volts	122.63 on 01/16/2015 11:35:00	123.92 on 01/16/2015 11:22:30
Max Volts	124.26 on 01/16/2015 11:25:00	126.16 on 01/16/2015 11:28:00
Median Volts	123.67	125.16
Average Volts	123.59	125.16

CURRENT

	Channel A	**Channel B**
Min Amps	240.5 on 01/16/2015 11:25:30	235.2 on 01/16/2015 11:27:30
Max Amps	383.9 on 01/16/2015 11:32:00	355.2 on 01/16/2015 11:32:00
Median Amps	325.4	300.2
Average Amps	316.6	295.5
	Channel C	
Min Amps	189.53 on 01/16/2015 11:27:30	
Max Amps	313.70 on 01/16/2015 11:32:00	
Median Amps	260.45	
Average Amps	252.78	

DEMAND AND ENERGY TIMEPLOTS

Site: basicpower 208 Sewer Plant

Measured from 01/16/2015 11:17:33.0 to 01/16/2015 11:36:27.0