MPTS INSTALLATIONS

FIELD TESTING – METAL WORKS

This case study is from 2010. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 is installed on computer controlled factory equipment. The client also has power factor correction units/power conditioning units. As you can see in the data provided below, the savings in Amps is 27.4 minus 22.6 amps. The power factor improved from 0.83 to 0.98.





Amp Readings
BEFORE
MPTS is switched ON



Amp Readings
AFTER
MPTS is switched ON





Power Factor Readings
BEFORE
MPTS is switched ON



Power Factor Readings
AFTER
MPTS is switched ON

Improvement despite delta type PF correction equipment installed.
In the table below, the payback and ROI adjusted to full utilization of the MPTS Unit as the field testing was done only on 25% utilization on a single isolated machine.

MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	27.4	22.6	4.8
Power Factor	0.83	0.98	18%
KVA	22	19	3
KVAH (KW=KVA, PF=1)	92,759	78,561	14,198
Annual Electrical Cost	$9,275.90	$7,856.10	$1,419.80
Payback period in years			2.6
ROI			38%

PRACTICAL TESTING – USA

This case study is from February 2011. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 is installed on a 24-hour application. The load is a compressor bank connected to the freezers. The client also has power factor correction units/power conditioning units. As you can see in the data provided below, the savings in Amps is 88.8 minus 73.9 amps. The power factor improved from 0.86 to 0.98.





Readings **BEFORE** MPTS is switched ON

Amperes
Power Factor
Voltage
Frequency

Improvements despite installed PF improvement equipment



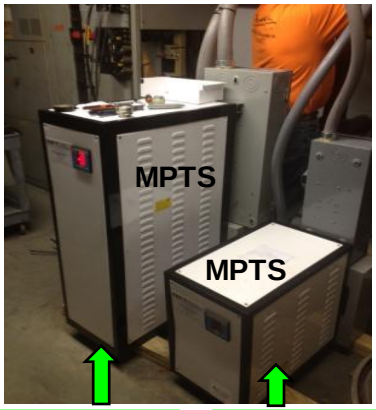
Readings **AFTER** MPTS is switched ON

The client had made a financial investment in power conditioning equipment to take the PF to 0.86. MPTS took the PF to 0.98 and also decreased losses/amps that reduces the KW and KWH.

MPTS 100	Without MPTS	With MPTS	Savings/Improvement
AMPS	88.8	73.9	14.9
Power Factor	0.86	0.98	12%
KVA	72	63	9
KVAH (KW=KVA, PF=1)	316,519	277,762	38,757
Annual Electrical Cost	$31,519.00	$27,776.00	$3,875.75
Payback period in years			3.8 Years
ROI			25%

FOUNDRY

This case study is from February 2012. The 480 Volts, 3 Phase, 100 Amp (MPTS-100) and 200 Amp MPTS-200 units are installed in a Foundry application. More than 32 machines, such as forging units, drilling machining, grinding machines, and related equipment are connected. The data provided below shows the savings in Amps equal to 178/188 Amps minus 155 Amps. The power factor improved from 0.79/0.83 to 0.98. As you can see, the performance is monitored with several meters.



200 amperes
480 Volts / 3 phase

100 amperes
480 Volts / 3 phase

Connected Load on 200A Unit

Amperes **178 – 188 Amp**

Power Factor - **0.79-0.83**

Voltage - **480 to 483**

Frequency Hz - **60**



Readings with MPTS

Amperes - **155**

Power Factor - **0.98**

Voltage - **480.8**

Frequency Hz - **60**



MPTS 200		Without MPTS		With MPTS		Savings / Improvement
AMPS		188		155		33
Power Factor		0.79		0.98		24%
KVA		153		123		30
KVAH (KW=KVA, PF=1)		318,225		256,528		61,697
Annual Electrical Cost		$35,004.75		$28,218.08		$6,786.67
Payback period in years						3.68 Years
ROI						27%

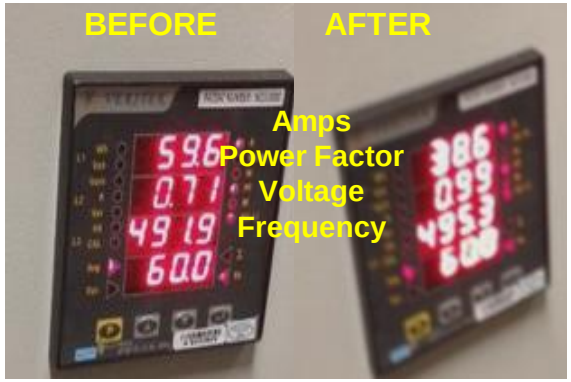




Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases.

GROCERY STORES

This case study is from June 2012. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 (three units) are installed on a 24-hour application. The loads are compressor banks connected to the freezers. Totally, 14 compressors are connected through the three (3) MPTS units. As you can see in the data provided below, the savings in Amps is 59.6 minus 38.6 per unit per MPTS. The power factor improved from 0.71 to 0.99.







MPTS 100		Without MPTS		With MPTS		Savings / Improvement
AMPS		59.6		38.6		21
Power Factor		0.71		0.99		39%
KVA		49		35		14
KVAH (KW=KVA, PF=1)		424,877		307,819		117,058
Annual Electrical Cost		$38,238.93		$27,703.71		$10,535.22
Payback period in years						1.42
ROI						70%

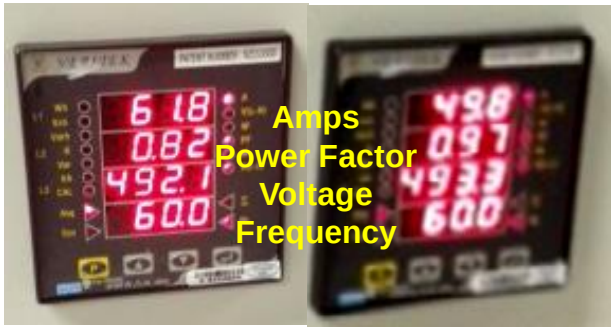
Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases. This case study is in Colorado where utility rates are the lowest in the country.

WATER FILTRATION

This case study is from August 2011. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 is installed on a 24-hour application where the water pumps are installed. The client also has power factor correction units/power conditioning units. As you can see in the data provided below, the savings in Amps is 61.8 minus 49.8 amps. The power factor improved from 0.82 to 0.97.

BEFORE
TE²S- OFF

AFTER
TE²S- ON



Amperes and Power Factor
When (MPTS**)** Total Electrical Energy Saver is **OFF and ON**



Power Factor
Phase – A Phase – B Phase – C
Phase – Average

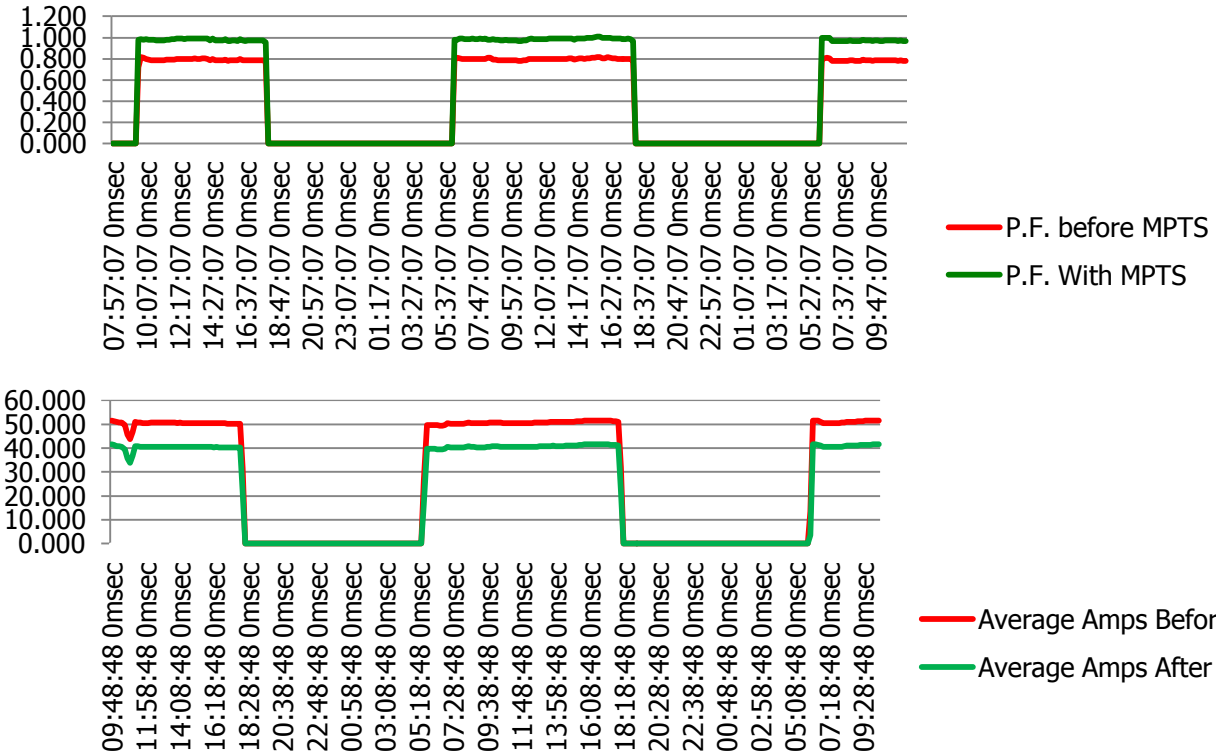


MPTS 100		Without MPTS		With MPTS		Savings / Improvement
AMPS		61.8		49.8		12
Power Factor		0.82		0.97		18%
KVA		50		42		8
KVAH (KW=KVA, PF=1)		440,560		368,632		71,928
Annual Electrical Cost		$39,650.40		$33,176.88		$6,473.52
Payback period in years						2.3 Years
ROI						43%

Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases. This case study is in Colorado where utility rates are the lowest in the country.

CHILLED WATER PUMP APPLICATION AT THE FEDERAL CENTER

This case study is from February/March 2013. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 is installed in a commercial building in a HVAC application. The data provided below shows the savings in Amps equal to 51 Amps minus 41 Amps. The power factor improved from 0.80 to 0.98.







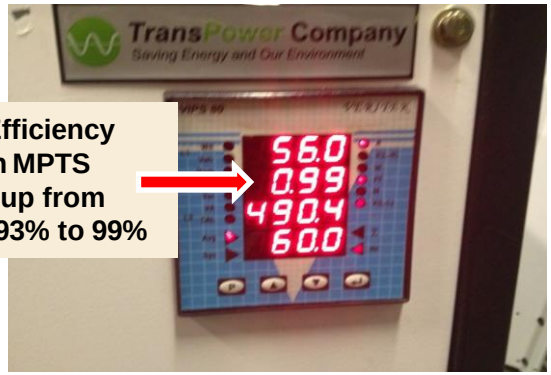
MPTS 100		Without MPTS		With MPTS		Savings / Improvement
AMPS		51		41		10
Power Factor		0.80		0.98		23%
KVA		42		34		8
KVAH (KW=KVA, PF=1)		129,491		105,707		23,784
Annual Electrical Cost		$12,949.10		$10,570.70		$2,378.40
Payback period in years						6.31 years
ROI						16%

The payback and the ROI is significant even with 50 % utilization of the MPTS unit.

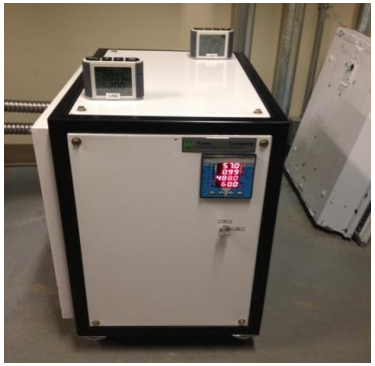
FITZSIMONS REDEVELOPMENT AUTHORITY PHASE I

This case study is from February/March 2013. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 is installed in a bio medical sciences commercial building in a 24-hour mixed load. The loads consist of medical equipment, testing equipment, computers, receptacles, etc. The data provided below shows the savings in Amps equal to 88 Amps minus 56 Amps. The power factor improved from 0.93 to 0.99





(PF) Efficiency With MPTS went up from 0.93 or 93% to 99%



Energy savings is realized with a favourable ROI and payback on this electrical panel where the loads are very efficient. The building and the equipment are fairly new, less than five years old.

MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	88	56	32
Power Factor	0.93	0.99	6%
KVA	72	68	4
KVAH (KW=KVA, PF=1)	627,336	595,329	32,007
Annual Electrical Cost	$62,733.60	$59,532.90	$3,200.70
Payback period in years			4.68 Years
ROI			21%

Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases. This case study is in Colorado where utility rates are the lowest in the country.

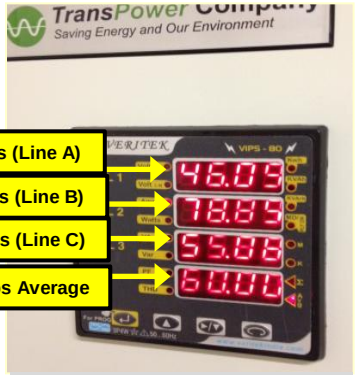
FITZSIMONS REDEVELOPMENT AUTHORITY PHASE II

This case study is from Phase II at the Bioscience Park Building. Two (2) MPTS-225H are installed. Both units have running Amps that vary between 80 Amps and 130 Amps. These are air conditioning units/amps for the HVAC.





Amp Readings
BEFORE
MPTS is switched ON



Amps (Line A)
Amps (Line B)
Amps (Line C)
Amps Average

Amp Readings
AFTER
MPTS is switched ON





The data shown below is for one (1) MPTS-225H unit.

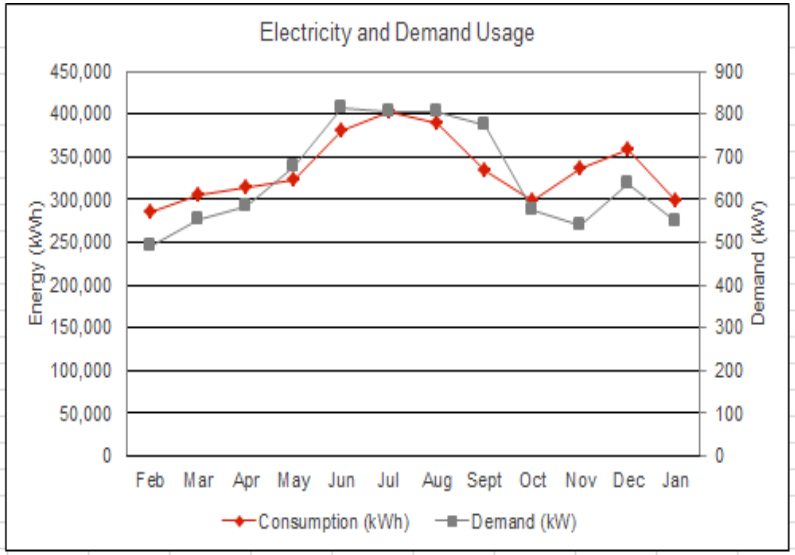
MPTS 225	Without MPTS	With MPTS	Savings / Improvement
AMPS	85.95	60.00	25.95 Amps
Power Factor	70%	98%	28%
KVA	71	50	21 KVA

Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases. This case study is in Colorado where utility rates are the lowest in the country.

FITZSIMONS REDEVELOPMENT AUTHORITY PHASE II

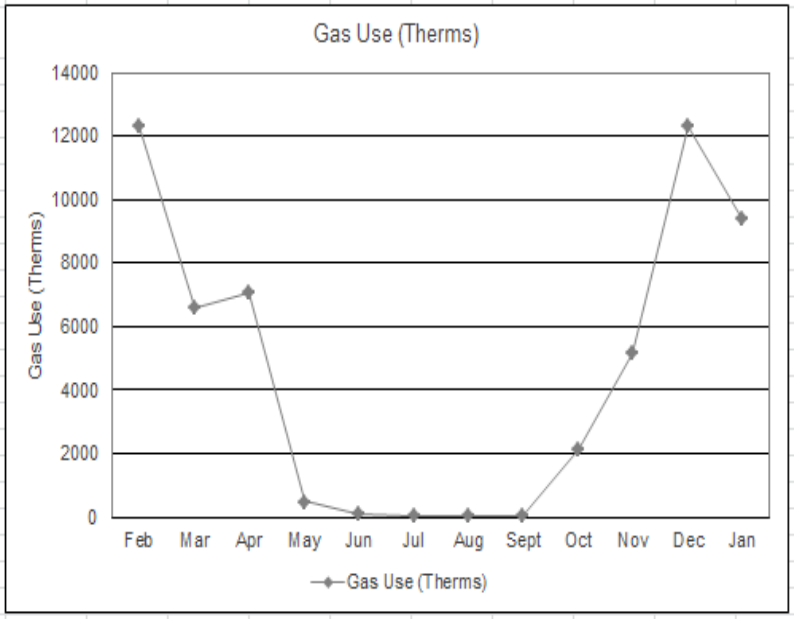
Electric Utilty Data from February 2013 to January 2014

Month	Days	Actual Demand	Billed Demand	Energy	Total Cost	Blended Cost/kWh	Load Factor
		kW	kW	kWh	$	$	%
Feb	29	490	490	285,961	$20,796	$0.07	83.8%
Mar	30	552	552	304,698	$22,686	$0.07	76.7%
Apr	31	583	583	314,652	$23,513	$0.07	72.5%
May	30	676	676	322,954	$25,890	$0.08	66.4%
Jun	30	813	813	380,351	$33,284	$0.09	65.0%
Jul	31	807	807	403,260	$33,762	$0.08	67.2%
Aug	30	807	807	389,766	$33,236	$0.09	67.1%
Sept	29	774	774	333,624	$30,176	$0.09	61.9%
Oct	29	574	574	298,669	$23,175	$0.08	74.8%
Nov	33	541	541	335,253	$24,074	$0.07	78.2%
Dec	34	638	638	358,910	$26,881	$0.07	68.9%
Jan	29	548	548	298,222	$22,730	$0.08	78.2%
Total	**365**			**4,026,320**	**$320,204**		
Avg.	**30**	**650**	**650**	**335527**	**$26,684**	**$0.08**	**71.7%**



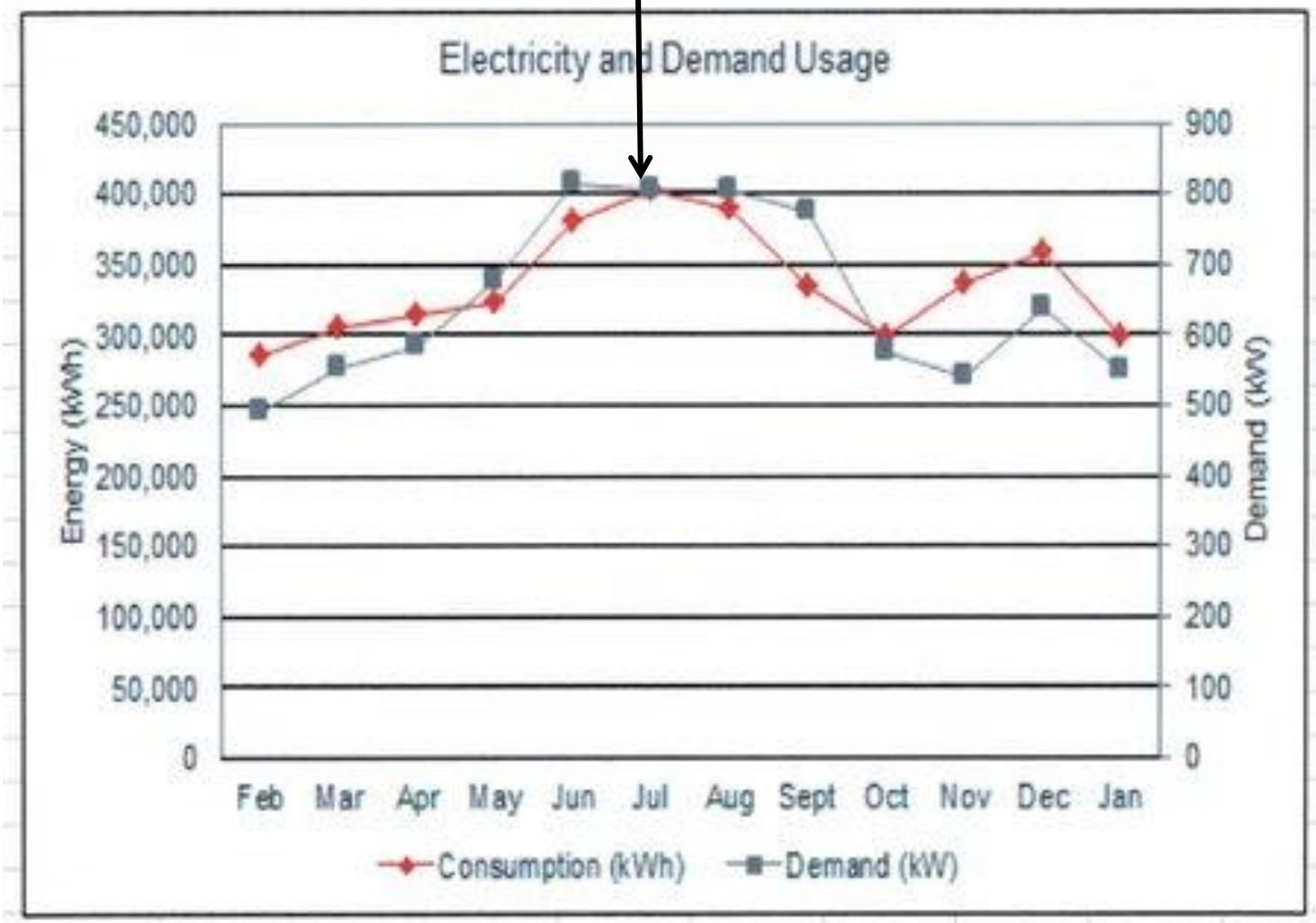
Gas Utilty Data from February 2013 to January 2014

Month	Days	Total Energy	Total Cost	Blended Cost/Therm	Degree Days (DD)	Therms/DD
		Therms	$	$		
Feb	29	12316	$7,278	$0.59	12,316	1.00
Mar	30	6583	$3,903	$0.59	6,583	1.00
Apr	31	7074	$4,075	$0.58	7,074	1.00
May	30	483	$638	$1.32	483	1.00
Jun	30	101	$460	$4.55	101	1.00
Jul	31	8	$409	$51.09	8	1.00
Aug	30	8	$487	$60.83	8	1.00
Sept	29	54	$520	$9.63	54	1.00
Oct	29	2127	$1,543	$0.73	2,127	1.00
Nov	33	5134	$3,024	$0.59	5,134	1.00
Dec	34	12290	$6,737	$0.55	12,290	1.00
Jan	29	9376	$5,691	$0.61	9,376	1.00
Total	**365**	**55554**	**$34,763**		**55,554**	
Avg.	**30**	**4630**	**$2,897**	**$0.63**	**4,630**	**1.00**



FITZSIMONS REDEVELOPMENT AUTHORITY PHASE II

MPTS installed on HVAC



The KW should have gone up to 890 in July, Aug ,Sept, and Oct
But went down –when MPTS was installed

THE TRAILS RECREATION CENTER

This case study is from one (1) MPTS unit installed at the Recreation Center (Health Club) and six (6) units are scheduled to go into this location after measurement and verification of the data collected from the first unit.





The Data shown below is for one (1) MPTS-100 unit.

MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	34 - 60	12 - 25	22 – 35 Amps
Power Factor	0.19	0.99	80%
KVA	27	10	17 KVA

THE TRAILS RECREATION CENTER (CONT.)

DATA COLLECTION

Trails Rec. Center



With MPTS Switched **“ON”**



With MPTS Switched **“OFF”**

Trails Rec. Center THD



With MPTS Switched **“ON”**



With MPTS Switched **“OFF”**

Trails Rec. Center AMPS



With MPTS Switched **“ON”**

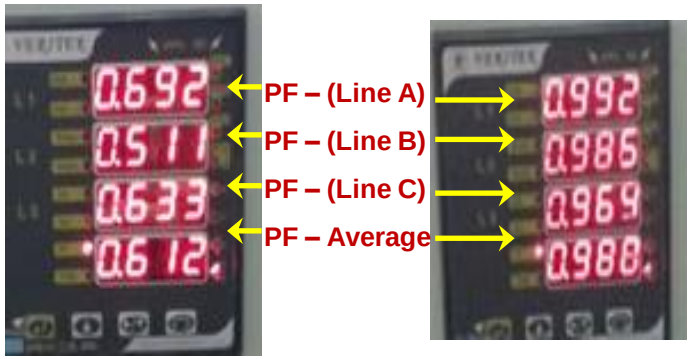


With MPTS Switched **“OFF”**

THE RABINE GROUP - CHICAGO

This case study is from a Leeds Certified energy efficient building. One (1) MPTS-225 H is installed on a sub-panel with breakers feeding 3 elevators, (20-40 hp), pump sets, 30 HP condenser, 15 KVA transformer and a sub-feed to another panel







The Data shown below is for one (1) MPTS unit at a certain point during the operation. One MPTS – 225 H is expected to save 30 Amps average. The PF is expected to remain above 97% even though the load is a complex load.

MPTS 225	Without MPTS	With MPTS	Savings / Improvement
AMPS	40 - 90	24 - 50	16 – 40 Amps
Power Factor	0.50 – 0.70	0.98	38% average
KVA	33 – 74	23 – 37	10 - 37

AURORA MENTAL HEALTH CENTER

This case study is from the Summer of 2012. The 480 Volts, 3 Phase, 100 Amp, MPTS-100 is installed in a commercial building on an HVAC/RTU application. The data provided below shows the savings in Amps equal to 56 Amps minus 28 Amps. The power factor improved from 0.49 to 0.97





Four MPTS-100 units are installed on all four of the RTUs on the building. The estimated KW savings is 40 to 60 KW based on actual energy bills in the Summer of 2012.
The Data shown below is for one unit during a Summer months.

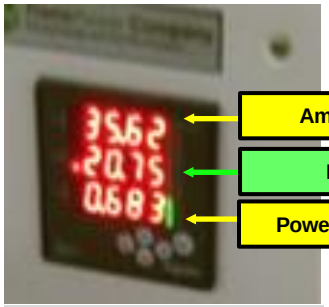
MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	56	28	28
Power Factor	0.49	0.97	98%
KVA	46	23	23
KVAH (KW=KVA, PF=1)	98,436	49,218	49,218
Annual Electrical Cost	$8,859.24	$4,429.62	$4,429.62
Payback period in years			3.3 Years
ROI			29%

Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases. This case study is in Colorado where utility rates are the lowest in the country.

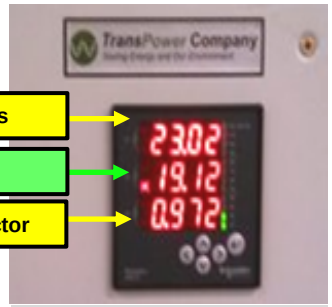
MORGAN COUNTY, FORT MORGAN, CO PHASE I

This case study is from the Administrative offices at Morgan County. One MPTS-100 is installed on an RTU. The existing 35 Amps dropped to 23 Amps. The PF improved to 97.2 percent from 68.3 percent.





Amp Readings
BEFORE
MPTS is switched ON



Amp Readings
AFTER
MPTS is switched ON



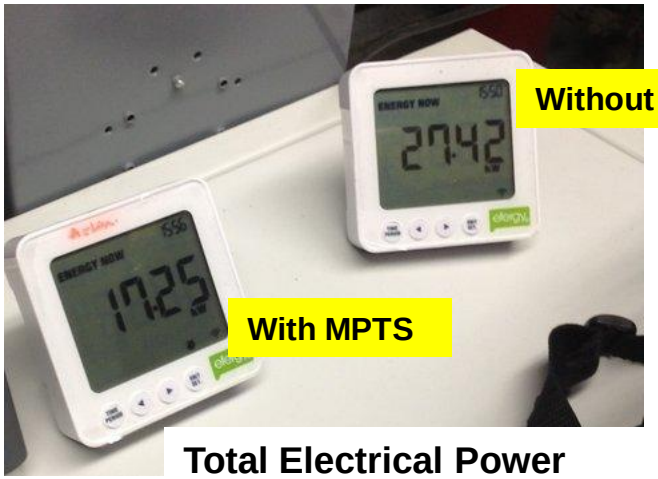
The Data shown below is for one MPTS running at 35 percent capacity. When two RTU's are hooked-up from the same MPTS, the payback will be less then 2 years and the ROI greater than 50 percent.

MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	35.62	23.02	12.6
Power Factor	0.683	0.972	0.29
KVA	30	19	11

Note: See Amps - The MPTS is not fully utilized – the payback period would be shorter when utilization increases. This case study is in Colorado where utility rates are the lowest in the country.

4,000 SFT. BUILDING IN CONNECTICUT

This case study is from a free-standing commercial office building. The MPTS 100 is installed on a 100 Amp panel with mixed loads.



Total Electrical Power



The Data shown below is for one MPTS running at 57 Amps and 61 percent power factor.
After connecting the MPTS unit, the Amps dropped to 27 Amps and the power factor improved to 97%.

MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	57	35	22
Power Factor	0.61	0.97	36%
KVA	27	17	10

FACTORY/CANADA

This case study is from an extrusion plant in Canada. The MPTS 100 H is installed on a 75 HP motor. The electrical power is 480 volts / 3 Phase / 60 Hz.





Amps
Power Factor
Voltage
Frequency

Amp Readings
BEFORE
MPTS is switched ON



Amp Readings
AFTER
MPTS is switched ON

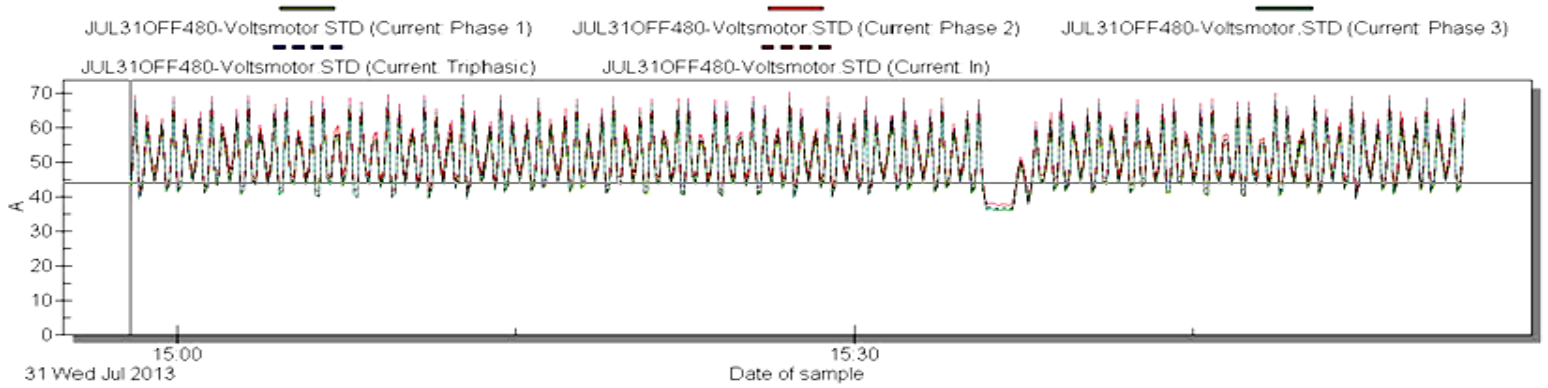
The Data shown below is for one MPTS running at 37.8 Amps and 19 percent power factor.
After connecting the MPTS unit, the Amps dropped to 6.3 Amps and the power factor improved to 97%.

MPTS 100	Without MPTS	With MPTS	Savings / Improvement
AMPS	37.8	6.3	31.5
Power Factor	0.19	0.97	78%
KVA	31	5	26

PENINSULA PLASTICS FN8000 AMPS

Readings with MPTS - OFF

MULTIGRAPHIC



Selected Variable: JUL31OFF480-Voltsmotor.STD (Current: Phase 1)

Act : 7/31/2013 14:57:55
Act : 43.935 (A)

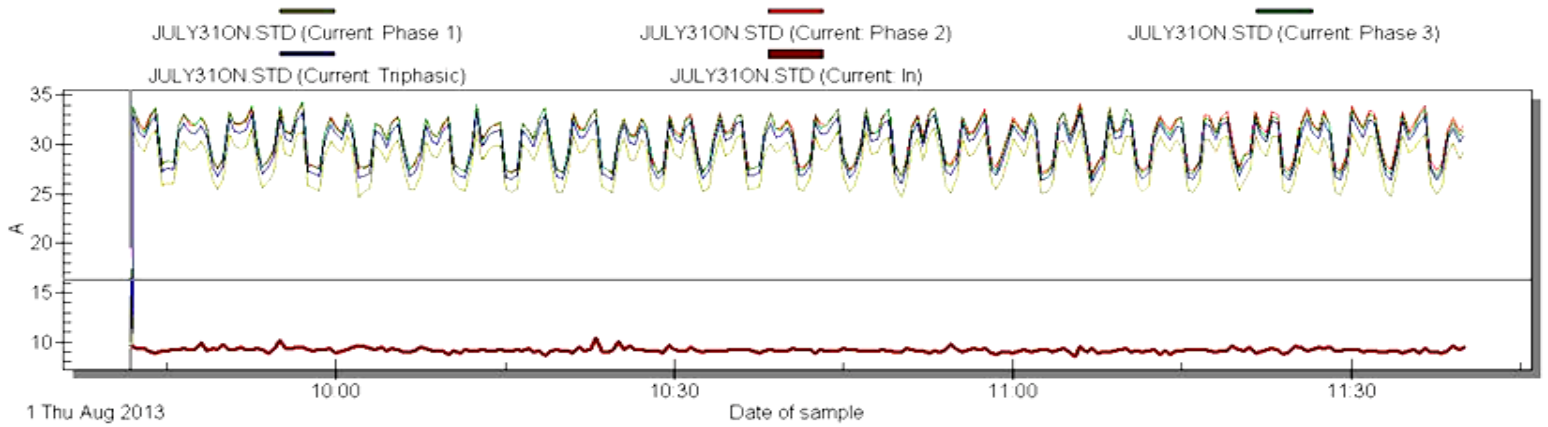
From : 7/31/2013 14:57:55
Maximum : 66.370 (A)

To : 7/31/2013 15:57:00
Minimum : 36.071 (A)

AVERAGE AMPS MPTS OFF	**50.5 AMPS**	**61.37 % less**
AVERAGE AMPS MPTS ON	**30.99 AMPS**	
DIFFERENCE OF	**19.51 AMPS**	

Readings with MPTS - ON

MULTIGRAPHIC



Selected Variable: JULY31ON.STD (Current: Phase 1)

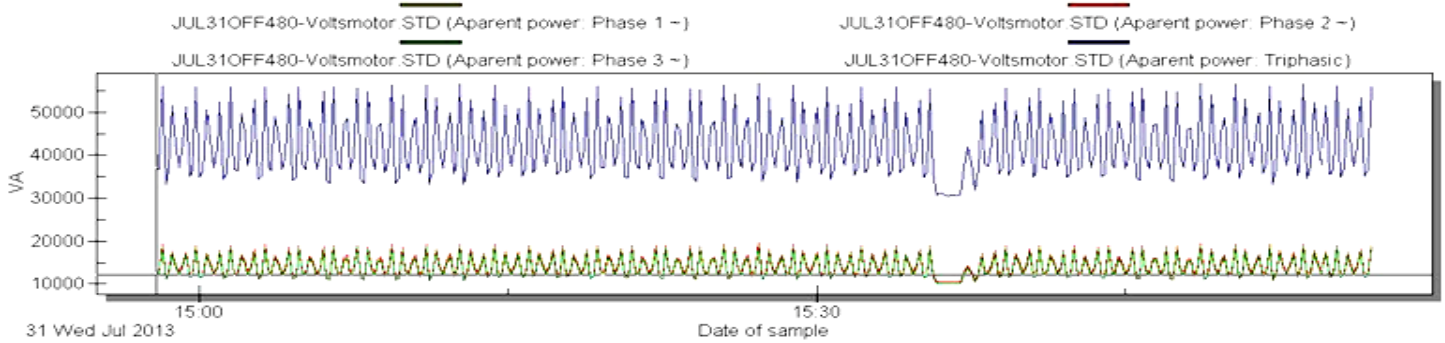
Act : 8/1/2013 09:41:43
Act : 16.321 (A)

From : 8/1/2013 09:41:43
Maximum : 31.747 (A)

To : 8/1/2013 11:40:00
Minimum : 9.699 (A)

Peninsula Plastics FN8000 VA

Readings with MPTS - OFF



Selected Variable: JUL31OFF480-Voltsmotor:STD (Aparent power: Phase 1 ~)

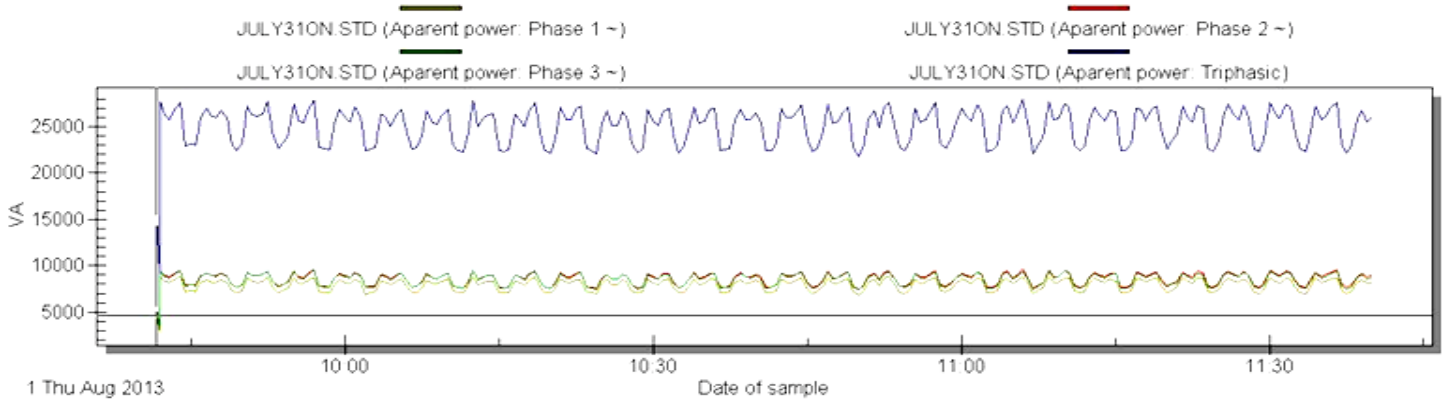
Act : 7/31/2013 14:57:55
Act : 12169.995 (VA)

From : 7/31/2013 14:57:55
Maximum : 18407.770 (VA)

To : 7/31/2013 15:57:00
Minimum : 10063.809 (VA)

AVERAGE VA MPTS OFF	42,226
AVERAGE VA MPTS ON	24,806
VA DIFFERENCE	17,420 OR 58.75 %

Readings with MPTS - ON



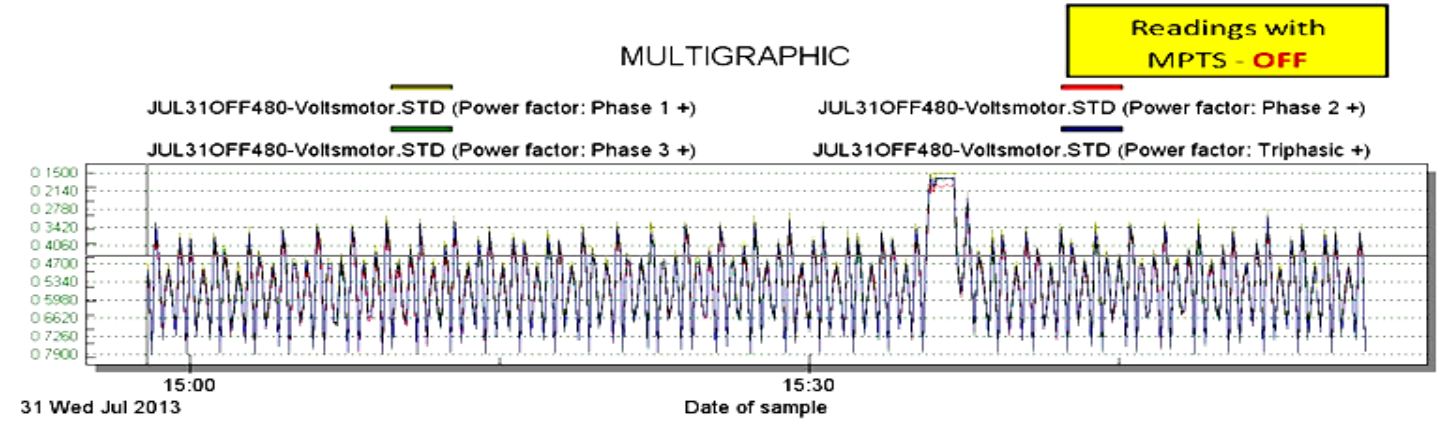
Selected Variable: JULY31ON:STD (Aparent power: Phase 1 ~)

Act : 8/1/2013 09:41:43
Act : 4553.559 (VA)

From : 8/1/2013 09:41:43
Maximum : 8856.400 (VA)

To : 8/1/2013 11:40:00
Minimum : 2706.021 (VA)

PENINSULA PLASTICS FN8000 POWER FACTOR



Selected Variable: JUL31OFF480-Voltsmotor.STD (Power factor: Phase 1 +)

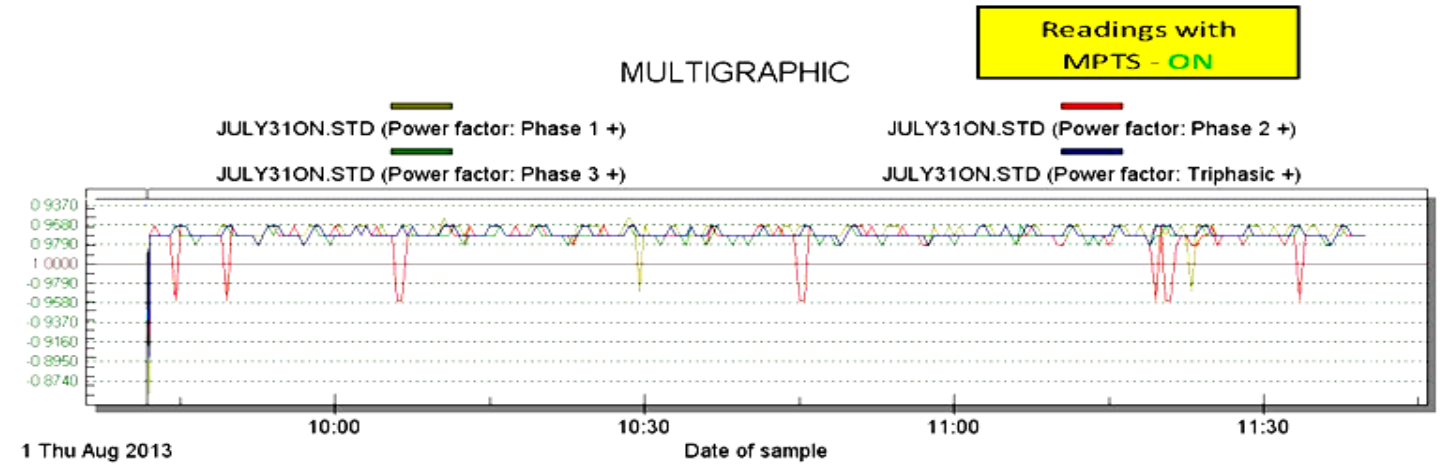
Act : 7/31/2013 14:57:55 | From : 7/31/2013 14:57:55 | To : 7/31/2013 15:57:00

Act : 0.44 | Maximum : 0.15 | Minimum : 0.78

POWER FACTOR MPTS OFF .54 PF 56.25% IMPROVEMENT

POWER FACTOR MPTS ON .96 PF

POWER FACTOR DIFFERENCE .42

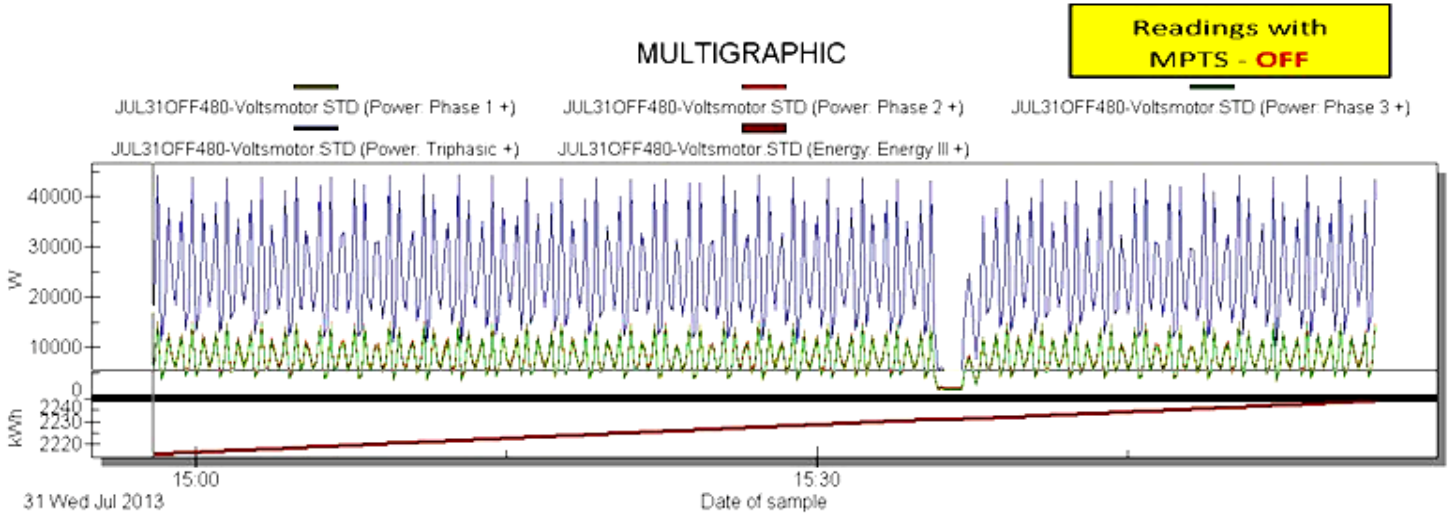


Selected Variable: JULY31ON.STD (Power factor: Phase 1 +)

Act : 8/1/2013 09:41:43 | From : 8/1/2013 09:41:43 | To : 8/1/2013 11:40:00

Act : 0.93 | Maximum : 0.93 | Minimum : -0.86

PENINSULA PLASTICS FN800 WATTS & ENERGY



Selected Variable: JUL31OFF480-Voltsmotor STD (Power: Phase 1 +)

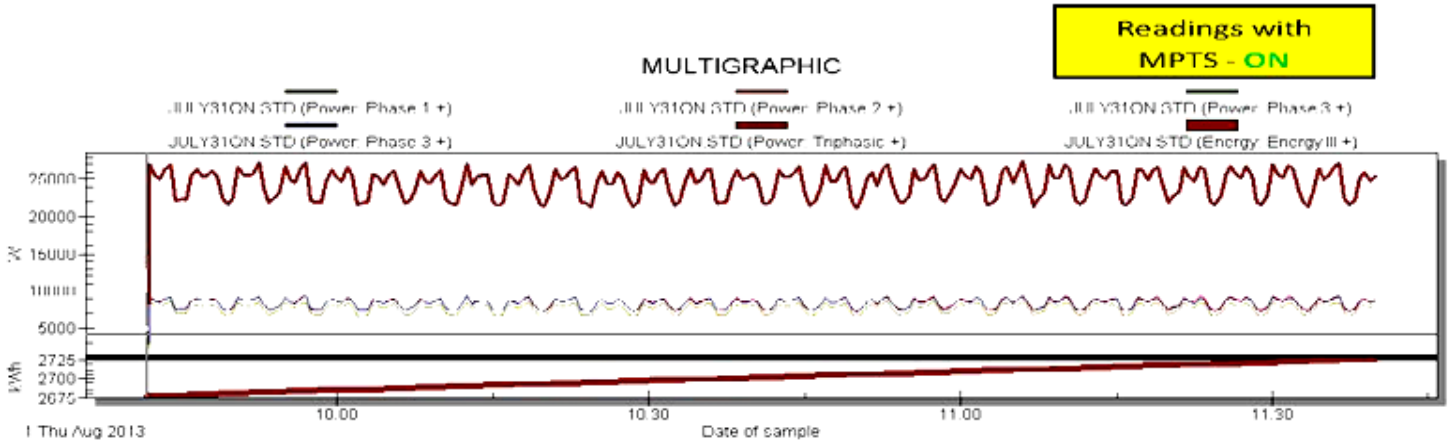
Act : 7/31/2013 14:57:55
Act : 5413 (W)

From : 7/31/2013 14:57:55
Maximum : 14377 (W)

To : 7/31/2013 15:57:00
Minimum : 1528 (W)

WATTS MPTS OFF 5413

WATTS MPTS ON 4267



Selected Variable: JULY31ON STD (Power: Phase 1 +)

Act : 8/1/2013 09:41:43
Act : 4267 (W)

From : 8/1/2013 09:41:43
Maximum : 18961 (W)

To : 8/1/2013 11:40:00
Minimum : 2057 (W)